

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 10, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 10, 2001

This is the first DNFSB site rep report from Los Alamos. I reported aboard on Monday, August 6th. Also, DNFSB staff members Nichols and Von Holle were on site this week to attend the LANL energetics materials research review. The review, sponsored by LANL and several other organizations, provided useful insights for evaluating the conservatism that exists when using results of weapons response calculations.

TA-55 Emergency Exercise: On Tuesday, the site rep observed the annual emergency evacuation exercise in the Plutonium Handling and Processing Facility (TA-55). The exercise was also observed by LANL senior management at the Division and the Deputy Associate Laboratory Director levels and by two DOE facility reps. The scenario involved a recurring criticality due to simulated SNM rearrangement and sprinkler activation (controls exist to prevent this accident). The scenario also included (simulated) an unconscious, heart-attack victim and two contaminated individuals. For safety reasons, there were some artificialities. For example, PF-4 workers began to secure glovebox activities, frisk, and exit to the corridors 30 minutes before the alarm. This placed work in a safe condition and minimized the chance of contamination being carried outside the building.

Overall, the facility was proficient in their response, the exercise was well-controlled, and LANL self-identified several opportunities for improvement, such as: (1) issue tracking at the incident command post; (2) maintaining status and priority on the injured; and (3) minimizing cross contamination from PF-4 personnel. The site rep believes that higher priority should have been placed on evacuating the simulated victim. This was not a straight-forward decision because of the simulated radiation levels. Another area for improvement would be the presence of DOE subject matter experts at annual drills, such as this, that provide an opportunity to observe the facility making decisions in a high stress environment that affect safety, security, and the time it would take to restore facility operations if such an accident were to occur.

Weapons Engineering Tritium Facility (WETF): The staff continues to closely monitor DOE and LANL progress in improving the safety posture and the Authorization Basis for LANL tritium facilities, including resolution of issues raised in the Board's letter to DOE (3/29/01). This week, the staff (Bamdad, Jordan, Keilers, Nichols) discussed with DOE the current status of the recently submitted WETF Safety Analysis Report and Technical Safety Requirements. DOE plans to complete their review and provide comments to LANL by mid-September.

Accident prevention and mitigation in WETF is dependent on the building structure and several programs - particularly, the inventory control program, the combustible loading program, and the storage container program. Progress is being made. The roof has been seismically upgraded (PC-3). The vault racks will be upgraded to meet PC-3 requirements during the next 6 weeks. DOE and LANL also plan to upgrade the vault walls to meet a 2 hour fire rating and to transition to improved storage containers capable of withstanding higher temperatures. The staff has questions on the high reliance on administrative controls (e.g., programs) and the level of defense in depth for fires, especially in the interim before these upgrades are completed. The staff will continue to work with DOE and LANL to ensure an appropriate set of controls are identified and implemented.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 17, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 17, 2001

Staff members Jordan and McConnell were on site this week to help establish the site rep office.

Plutonium Handling and Processing Facility (TA-55): Early Monday morning, an off-site voltage fluctuation caused a complete loss of electrical power in TA-55. Essential lighting and instrumentation loads, including stack monitors, were immediately picked up by an uninterruptible power supply. Within 4 minutes, power to ventilation was restored by operator action. By design, this is not an automatic function in TA-55. During this period, normally occupied spaces were susceptible to possible air-flow reversal. Within about 3 hours, radcon personnel had confirmed there was no uncontrolled spread of contamination. Within 4 hours, normal operation was restored. Overall, it appears that operators responded per procedure, equipment functioned as designed, and there was no radioactive release to the environment. However, DOE and LANL review of the event concluded that robustness of the facility could be improved by automatically restoring power to ventilation, similar to that done in other nuclear facilities. This appears to be an improvement worth pursuing.

Improving Nuclear Facility Operations: Last week, BWXT Services issued a report on their 4-month evaluation of LANL strengths and weaknesses in nuclear facility operations and made recommendations for improvements. Overall, BWXT observed that LANL nuclear facilities are well managed in many respects, and that LANL is capable of identifying problems and developing appropriate solutions but frequently has difficulty instituting lasting change. The report also identified good practices and areas of excellence that are starting points to build overall improvement. The site rep understands that LANL is reviewing the report and recommendations.

Recommendations 94-1/2000-1: On Tuesday, LANL personnel provided a briefing on their current assessment of the 94-1 inventory, prioritization, stabilization processes, disposition options, and tentative schedules. This was a "shot-in-time," which supports DOE developing a response to the issues raised in the Board letter of March 23, 2001. The staff is planning further discussions with LANL in the coming weeks on the status of 94-1 planning and activities.

August 24, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending August 24, 2001

Plutonium Handling and Processing Facility (TA-55): On Wednesday, as part of a daily surveillance, TA-55 identified a high reading on a fixed head air sampler in one room, indicating an airborne release and uncontrolled spread of contamination. Access to the room was controlled pending resolution. Thirteen people have been requested to submit bio-assay samples to determine if they received an uptake. At this time, the source appears to be a mechanical seal on a glove-box vacuum pump. The facility is considering backfitting seal-less pumps as a long-term solution.

On Thursday, TA-55 moved several hundred TRU waste drums that were stored in a Butler building (PF-185) back into the hardened shell of the facility in order to comply with their authorization basis. This addressed concerns expressed by DOE on Wednesday that TA-55 was operating outside its authorization basis and that PF-185 had accumulated sufficient inventory to be categorized as a Hazard Category II facility, per DOE STD-1027.

It appears that, since at least 1998, PF-185 has been used for staging drums and waste containers before they are shipped out to Solid Waste Operations (TA-54). In June, while preparing a process hazards analysis (PrHA), LANL identified that these waste operations were anticipated in the current safety analysis report (1996) but relevant accidents were not addressed. PF-185 basically provides a weather-shield and airborne monitoring but little high wind, missile, or seismic protection. Many of the containers meet DOT Type A shipping requirements but are hypothesized to fail in a fire. As a result of the PrHA, TA-55 declared a Potentially Inadequate Safety Analysis (PISA) in June and implemented additional controls. In July, LANL informed DOE that a positive Unreviewed Safety Question Determination existed. Based on DOE concerns expressed to LANL this week, the facility chose to relocate the drums. This action restored operations to within the authorization basis.

Chemistry and Metallurgy Research Building (CMR): Last week, one of the DOE Facility Reps raised the question of whether the large number of ceiling tiles missing in the facility would adversely affect performance of the Safety Class fire suppression system. The ceiling tiles have been missing for several weeks to provide access for new cable runs and asbestos abatement. If a fire were to occur, the missing tiles would allow the heat layer to build up above the tiles, delaying sprinkler activation and possibly fire department response. On Tuesday, CMR management concluded that sprinkler system reliability was degraded. On Wednesday, LANL proposed and DOE approved a Justification for Continued Operation, through November, that involves posting a continuous fire watch in the affected sprinkler coverage area at all times while ceiling tiles are removed.

The site rep believes that the DOE Facility Representative should be credited for identifying the problem and the facility should be credited for following up. To prevent recurrence, it may be worthwhile for facility personnel (particularly system engineers and those preparing work packages) to receive additional training on when to enter LCO conditions, as well as on the authorization basis, the safety systems, and the assumptions made in the facility's safety analyses.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 31, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 31, 2001

Plutonium Handling and Processing Facility (TA-55): In a January 22nd letter to DOE-AL, the Board expressed concerns on the identification of quality requirements for the TA-55 Fire Protection Yard Main Replacement Project (FPYMRP) and on the need to complete this project without further delay. The project is intended to replace the TA-55 leaking fire water loop and make other upgrades that improve system reliability. Procuring the polyethylene piping and components is on the critical path. In early August, the Board's staff questioned the purchase order quality provisions. Following discussions with the staff this week, DOE and LANL agreed to revise and clarify both the purchase order and receipt inspection requirements to be more specific about the testing requirements and criteria, as well as test result traceability to material lot. DOE anticipates minimal impact on delivery. Next Friday, a DOE Energy Systems Acquisition Advisory Board (ESAAB) will review the project's preparations for start of construction (i.e., Critical Decision 3).

Radiochemistry Laboratory (TA-48): Last Friday, a TA-48 supervisor received Cm-244 alpha contamination on his shirt while performing an accountability inventory in the actinide research laboratory. The laboratory has a small actinide inventory stored in metal and glass cabinets in a controlled-access, radiological buffer area. The contamination was released from a torn zip-lock plastic bag containing a glass flask of Cm-244 solution with a glass stopper. The supervisor was wearing a lab coat, gloves, safety glasses, and booties. While the radiological consequences here were minimal (i.e., negative nasal smears, no airborne alarm, no skin contamination), it appears that a worker-safety review of this lab's material storage and handling practices would be worthwhile.

Chemistry and Metallurgy Research Building (CMR): On Tuesday, a maintenance worker skipped a hold point in a work procedure and removed 6 gages from service that are used to monitor differential pressure between the Wing 9 hot cells and the occupied space. An operator conducting daily rounds discovered the problem within an hour, but it was another 2 hours before the facility took appropriate actions, including terminating normal operations in Wing 9. Facility management has reported the event as a TSR violation and has stopped CMR upgrade work until a work package review is completed. The site rep believes that there are clear work control and training issues here, for both the operational and maintenance personnel. The facility is preparing a recovery plan.

Conduct of Operations: On March 15th, the DOE conduct of operations order (DOE O 5480.19) was added to the LANL contract. Implementation in key facilities is expected by the end of FY 02. The LANL Director has set an expectation that the quality of LANL operations match the quality of its science and technology. In July, LANL assigned responsibilities and identified the process requirements for verifying implementation. In mid-August, LANL submitted to DOE an implementation plan, identifying three essential components: (1) DOE approved documentation on requirement applicability and facility verification; (2) both institutional and facility actions to close gaps in implementation; and (3) a viable LANL self-assessment and continuous improvement process. During the next few weeks, DOE and LANL will be conducting joint training to assure starting this process with common expectations that are consistent with both the necessary formality of operations and the laboratory's fundamental research and development mission.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 7, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 7, 2001

Plutonium Handling and Processing Facility (TA-55): There is considerable DOE and LANL management attention directed now on the several hundred TRU waste containers that were stored in a Butler building (PF-185) and were relocated two weeks ago to within the hardened shell of the main processing building (PF-4). The site rep report of 8/24/01 discusses how this problem was discovered and the actions taken. While there are valid questions being asked on how this situation arose, the current priorities are unclear. The site rep believes that the priorities need to be quickly established considering both safety and operational needs. At this time, it appears appropriate from both these aspects to pursue safe and timely reduction of the waste backlog, as well as fixing the management processes to prevent recurrence of the backlog.

Work Controls: On Wednesday, DOE informed LANL that skill-of-the-craft (SOC) work is being done outside the LANL-approved work control process. LANL requirements define SOC tasks as discrete, defined work activities to be executed by either a qualified craftsman with the expertise to identify and control the hazards or by workers using a written procedure that specifies the hazards and associated controls. Under these conditions, LANL requires no separate, formal task hazard analysis. DOE observed that LANL had a Laboratory Implementation Requirement (LIR) for maintenance SOC work that was replaced in June with an expanded LIR, now applicable to all facility work. However, the latter has not yet been fully implemented, since checklists it requires to be used to document worker qualification have not yet been approved. DOE directed LANL to provide by Monday either a corrective action plan or evidence that all LANL SOC work has ceased.

Improving Performance on Technical Safety Requirements (TSRs): During the past year, LANL has been assessing TSR performance at nuclear facilities to meet a FY-01 contract provision. In December, LANL developed a review plan. Between January and May, a LANL review team investigated TSR-related occurrence reports issued since January 1999 from 19 nuclear facilities. The team also performed field observation and document reviews in 9 nuclear facilities. During the individual facility reviews, the team identified 22 strengths and 58 issues. In June and August, the team issued summary reports, identifying noteworthy practices and opportunities for improvement.

Overall, the LANL team appears to have conducted a thorough and objective appraisal. This week, LANL held a well-attended workshop on the findings. While there are many noteworthy practices, LANL identified that about half of the facilities assessed need improvements, such as more effective management oversight, better TSR document control, improved instrument calibration programs, better operating mode change controls, and more user-friendly and technically accurate surveillance procedures to which personnel are formally trained. The team also observed that the facilities generating the most issues were also generating the least number of occurrence reports. Between January 1999 and May 2001, only 5 of the 19 nuclear facilities submitted occurrence reports for authorization basis problems. If the facilities pursue these improvements, it is reasonable to expect in the near term that the number of occurrence reports will increase but the significance of the events should decrease. The LANL final report is due to DOE this month.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 14, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 14, 2001

Security: This week, LANL implemented heightened security measures, which remain in effect.

Chemistry and Metallurgy Research Building (CMR): On Tuesday, CMR personnel reported elevated airborne monitoring results from one fixed head sampler, indicating an unanticipated airborne release into one room. The results were about 22 percent higher than the limit for continuous occupancy (i.e., 40 DAC-hours for a weekly sample). The facility is investigating the cause, and its followup actions appear to have been appropriate. No other contamination was found in subsequent surveys.

Work Controls: In response to a DOE request last week, LANL is limiting skill-of-the-craft (SOC) work to maintenance activities within the current LANL approved work control process and has submitted a plan for expanding use of the SOC approach within facilities by mid-FY02. Key elements of the plan include: completing development of worker qualification checklists; improving the Laboratory Implementation Requirement (LIR); piloting the expanded SOC approach at one facility (DX); incorporating lessons learned into the checklist and LIR; training facility management and supervisors; and verifying implementation during periodic management self-assessments.

While this plan appears to be well-structured, there have been many DOE occurrences involving jobs mis-categorized as "routine" and started as skill-of-the-craft without an adequate hazard analysis, leading to a facility upset. It would appear that expanded use of the SOC approach, if pursued, needs to be carefully considered and implemented at the individual facility and activity levels to avoid conditions conducive to initiating an accident.

Plutonium Handling and Storage Facility (TA-55): Last Friday, the DOE-AL Manager approved starting the construction phase (CD-3) of the Fire Protection Yard Main Replacement Project. The objective is to replace the existing safety significant system with a more reliable one that meets current codes and would remain operational after current design basis accidents (site rep weekly 8/31/01). Long-lead procurement (e.g., for piping) is underway; however, DOE has not yet authorized LANL to proceed, pending DOE review of relevant hazard analyses and performance of a readiness assessment on construction activities. Key milestones are completing construction of pump houses and tanks by mid-May 2002 and of underground piping by mid-July 2002.

Recommendation 2000-2: Board Recommendation 2000-2 addresses configuration management of vital safety systems. The DOE implementation plan includes commitments to develop a plan for a comprehensive fire safety review and to perform Phase II assessments of selected vital safety systems, including fire protection systems. Several DOE sites, including LANL, are pursuing completion of phase II fire protection assessments as part of the comprehensive review, which would be an efficient use of resources. This week, the DOE EH-led team performing the comprehensive reviews conducted a scoping visit and initial assessment at LANL. The full review is scheduled for October 15-26, with a final report expected in mid-November. Within the next few weeks, the team is expected to identify the specific facilities and systems that they will evaluate.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 21, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 21, 2001

Chemistry and Metallurgical Research Building (CMR): On Tuesday morning, a security checkpoint was set up at the CMR southeast gate and that gate was opened to provide access to the TA-3 Admin building parking lot. The CMR facility estimates that this has increased traffic flow around two sides of the CMR building by an order of magnitude, since the CMR southeast gate was previously closed to thru-traffic.

The site rep understands that neither the CMR facility management nor the DOE-LAAO operations or authorization basis staff were involved in the decision making process to reroute traffic inside the fence in close proximity to the CMR building – a Hazard Category 2 Nuclear Facility. Subsequent DOE and LANL reviews identified several new safety issues created by rerouting traffic.

On Thursday, the facility submitted and DOE approved a “backward looking,” unreviewed safety question (USQ) on the rerouted traffic. LANL identified the USQ as positive because of a new accident scenario and a new failure mode for a safety class system, created by the traffic rerouting. As a result of the backward looking USQ, LANL has taken compensatory measures to address these new safety issues.

While the compensatory measures taken appear to be adequate in the short-term, the site rep believes that the decision-making process followed was not unified and was not consistent with the principles of integrated safety management. Key decisions were made quickly with little involvement of the knowledgeable and responsible personnel, particularly for operations and safety. Key steps of the process, such as completing a USQ before the action, were skipped. The site rep acknowledges that there are times when senior management needs to make expeditious decisions. However, considering how quickly the safety review process was completed later in the week, it appears in hindsight that the correct process could have been expeditiously followed in this case.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 28, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 28, 2001

Plutonium Handling and Processing Facility (TA-55): In March 2000, a Pu-238 airborne release occurred from a TA-55 glovebox system, resulting in at least 7 of 8 workers in the room receiving confirmed intakes. The source was discovered to be a finger-tight compression fitting in a contaminated vacuum line. The line was disturbed by a technician troubleshooting a glovebox auxiliary system using skill-of-the-craft as work authorization. Contributing to the event was a ball valve in the vacuum line that had degraded teflon seats.

In July 2000, DOE issued a Type A accident investigation report on this event, which includes a list of causal factors and judgements of need. In September 2000, LANL provided a corrective action plan to address the DOE findings. At the facility level, the plan includes improving hazard analyses, work planning and controls, configuration management, and conduct of operations. At the institutional level, the desired improvements include glovebox quality assurance, communications (e.g., equipment status), defined roles and responsibilities, and the level of reliance on skill of the craft. Several of these have been discussed in recent site rep reports. Many of these involve ensuring that Integrated Safety Management is fully implemented.

During the last year, LANL has made progress on the above, including inspecting the integrity of the roughly 30,000 compression fittings in the facility. Discrepant gloveboxes and fittings have been or will be corrected on a risk-prioritized schedule. Other actions remaining include developing as-built configuration records for glovebox auxiliary systems; replacing the continuous air monitors (CAMS) to increase sensitivity by nearly an order of magnitude; and implementing a plan to inspect and replace degraded teflon components. The overall plan appears well-supported by DOE and LANL senior management. Within the next month, DOE expects to begin a review to validate many of the actions completed in the facility.

Weapons Engineering and Tritium Facility (WETF): Last Friday, DOE withheld approval of the updated authorization basis for WETF, consisting of the Final Safety Analysis Report (FSAR) and the Technical Safety Requirements (TSRs). During the comment resolution meeting last week, DOE, the facility itself, and an independent LANL review team each raised numerous questions on the safety analyses. LANL estimates that resolving the issues will cause a two month slip in operational readiness reviews for new WETF systems required for consolidation of LANL tritium operations. The site rep believes that the dependence on administrative controls and the level of defense in depth for fire protection still merits attention (site rep weekly 8/10/01). Also, it may be worthwhile to postpone finalizing the TSRs until after they have been incorporated into a set of draft procedures and those procedures have been validated by operations personnel.

Fire Protection: LANL has been investigating delayed signal transmissions from facility fire alarm panels to the central alarm station. For nuclear facilities, such problems might lead to delayed fire department response, possibly violating assumptions made in safety analyses. Personnel training is currently being used as a compensatory measure (i.e., dial 911). DOE and LANL are initiating a site-wide fire alarm system replacement project, which may address the longer term issue.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 12, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 12, 2001

Recommendations 94-1/2000-1: DNFSB staff members Contardi, Kasdorf, Leary (OE), and Plaue were on site this week reviewing nuclear material stabilization activities and planning. The staff was encouraged by both the increased DOE support and the increased DOE/LANL emphasis on applying sound project management principles to these activities. While both funding and the level of activity have increased recently, project planning is still highly preliminary. DOE and LANL were not ready to discuss with the staff the program specifics, such as target stabilization dates, by material category, that are being used for planning purposes (i.e., dates other than FY 2010 for completing stabilization). LANL expects to be ready for these discussions within a few months and to have a draft program execution plan with resource-loaded schedules in February 2002.

Since 1995, LANL has stabilized nearly 6,000 items and achieved a significant risk reduction. However, progress has been slow during the last 2 years, and the inventory to be stabilized has increased. About 90% of the stabilization progress occurred prior to FY 00. The extended TA-55 shutdown to address the March 2000 Type A event also slowed progress (site rep weekly 9/28/01).

Currently, LANL has about 5,600 items, programmatic and excess, that need to be stabilized and properly packaged or disposed as waste. A large fraction are in older, non-standard containers (i.e., not the drop-tested, screw-lid, vent-filtered design). The schedule problem is compounded by the fact that the LANL 94-1 budget fell nearly four-fold between FY 96 and FY 01 (\$15.1M and \$3.9M, respectively), causing processing lines to be idled and experienced personnel to be transferred to other programs. While DOE recently provided supplemental funding (\$6.8M), it is likely that renewing processing and increasing qualified staffing without impacting other projects will be critical path.

The staff observed that LANL continues to study a multitude of options. Besides end date (per LANL, FY 2010), the risk reduction profile with time may be a useful measure for weighing these options. It appears worthwhile now to aggressively pursue options with the least programmatic uncertainty and work toward maximal and efficient campaigning of materials. The staff also continues to believe that the process vs discard decision for materials can be streamlined, possibly by taking advantage of lessons learned at other sites (e.g. RFETS). The container surveillance program could also be improved to increase confidence in container integrity and provide a basis for assumptions being made about the impact of aging on older packages and materials. The priority of processing legacy vs new residues continues to merit examination. The staff will continue to work closely with DOE and LANL to address these and other questions on accelerating LANL stabilization activities.

Emergency Operations Center (EOC) Replacement Project: On October 2nd, DOE approved the performance baseline (CD-2), the project execution plan, and the start of construction (CD-3) for the EOC Replacement Project. LANL is pursuing a design-build acquisition strategy. The seismic requirements are those for Performance Category 2 (PC-2, i.e., an essential facility) with ductile detailing and with base shear loads set by using a reduced ductility factor (doubles the seismic load). PC-2 loads are also being used for systems important to EOC operation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 19, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 19, 2001

DNFSB staff members Blackman, Jordan, Rosen, and Shackelford were on site this week reviewing design, procurement, configuration management, and maintenance of safety-related systems.

TA-55 Fire Protection Yard Main Replacement (FPYMR) Project: The FPYMR Project had its ground-breaking this week, marking the start of construction. The project is intended to replace the leaking fire water loop and improve system reliability (site rep weekly 8/31/01). Looking forward, construction will increase risk during periods when the building is penetrated and when firewater is not available to sprinklers. Last month, LANL proposed and DOE approved with comment additional controls to mitigate these risks. Some of these controls are as follows:

- ? Construct a temporary confinement structure in the basement around the new north-side building penetrations until confinement is reestablished, not to exceed 12 days
- ? Place operations in standby while the south and west side laterals are installed through building penetrations, not to exceed 8 days
- ? Establish a fire watch during subsystem tie-in and upon loss of the in-service firewater tank
- ? Place operations in standby if the fire suppression system cannot be returned to operability, and within 2 hours if the single, in-service firewater tank goes out of service

Because of the complexity of the modifications, DOE also prohibited simultaneous work involving confinement breach, flow path interruption, and tank or fire pump modification. LANL is developing an integrated construction schedule to meet the time and sequencing restrictions.

Quality Assurance (QA): The staff was briefed on recent activities to improve laboratory QA. During the last 2 years, numerous internal and external reviews have identified institutional QA issues at LANL. Currently, individual facilities and projects have QA programs that were developed more or less in isolation. They are inconsistent, of varied pedigree, frequently expert-based instead of standards-based, and generally not well implemented. QA oversight and accountability also need improvement. DOE appears committed to developing their local QA expertise and increasing oversight. Earlier this year, DOE contracted a nuclear QA expert to assess the program, in response to a Board letter (1/22/01). The subsequent review focused on QA elements involving design control and procurement for the CMR upgrades and the TA-55 FPYMR project. A report is expected shortly. This effort has provided the foundation for future improvements on the DOE side.

LANL management also understands the issues and considers making improvements a high priority. LANL is close to completing an updated, internal assessment and developing a corrective action plan to move forward. LANL is also planning to strengthen QA management by appointing a Senior Quality Officer, and establishing a Quality Assurance Council made up of senior line management. Key organization changes are expected within the next 3 months. Similar to the initiative to improve conduct of operations (site rep weekly 8/31/01), improving institutional QA is expected to be a long process, requiring continuous management emphasis and attention. One key to success may be for the institutional program to evolve from the best features of several well-developed facility and project programs that are now in place. Success will clearly require frequent and close interaction between the facility/project level and the institutional level throughout the improvement process.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 26, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 26, 2001

Staff members Kasdorf and Leary (OE) were here this week attending the annual 94-1 R&D review. Martin and Nichols were also on site reviewing development of safety system design requirements.

Recommendation 2000-2: The site rep understands that DOE headquarters has suspended plans to conduct comprehensive fire safety reviews at DOE sites, including LANL (site rep weekly 9/14/01). Although these may resume, LANL is now exploring other options. LANL intends to send to DOE in November a plan for executing Phase II assessments and plans to begin these assessments in January. These developments may lead DOE to propose implementation plan changes.

Recommendations 94-1/2000-1: Recent 94-1 research and development (R&D) has focused on resolving moisture-related issues. Process control may be a viable option. Several studies presented this week indicated that, with the exception of chlorides, materials calcined at 950°C should meet the STD-3013 moisture requirements if ambient glovebox humidity is controlled to a reasonably low level. Also, DOE sites are moving away from using super-critical fluid extraction (SFE) for moisture measurements. LANL has investigated the recent SFE problems, considers the causes to be understood, and is continuing SFE development. Future R&D is expected to focus on gas generation – particularly, on reducing the conservatism in the current STD-3013 design pressure requirements.

LANL Authorization Bases (AB): LANL has made 3 major AB submittals to DOE this year (i.e., safety analyses and controls). These are for the critical experiments facility (TA-18), the plutonium processing facility (TA-55), and the weapons engineering and tritium facility (WETF). To date, DOE has reviewed two of these packages (TA-55, WETF) and acted on one (WETF). Throughout this process, DOE has been concerned about the quality of these submittals (site rep weekly 9/28/01).

LANL senior management has recently reviewed these submittals and has also concluded that improvements should be made. This year's submittals were driven by contractually imposed deadlines. They were not made using the LANL internal AB review process that has been in development. This week, LANL proposed performing an independent and rigorous quality check of these documents, considering DOE observations to date, and then resubmitting to DOE after final sign-off by the cognizant Associate Director. DOE and LANL would also revise the master schedule for AB document development. This will likely slow down the AB improvement effort but increase its probability of success. Appropriate prioritization and resource-loaded scheduling with contingency appear key. LANL intends to use the lessons learned to improve the process.

Critical Experiments Facility (TA-18): Like nearly all other LANL facilities, TA-18 needs to improve its performance on Technical Safety Requirement (TSR) compliance (site rep weekly 9/7/01). A recent DOE-EH letter to LANL discusses 3 TSR violations in TA-18 this year and states that TA-18 self-identified instances where corrective actions in 2000 were incorrectly reported as closed. The trend indicates that TSR training conducted in the facility was not adequate, particularly for surveillance requirements. LANL is pursuing further corrective actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 2, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 2, 2001

Los Alamos Neutron Science Center (LANSCE): On Monday, DOE approved a Basis for Interim Operation (BIO) for LANSCE experiments involving neutron scattering by actinide targets. These will be Hazard Category 3 activities (HC-3). The targets will consist of double-encapsulated solid samples containing up to 60 grams of Pu-239 equivalent (PuE). The experiments support the Stockpile Stewardship and Management Program and are expected to continue through 2003. LANL anticipates some future experiments will need to be conducted at elevated temperatures, which is not currently approved. This will require DOE and LANL to revisit the actinide BIO.

Plutonium Handling and Processing Facility (TA-55): TA-55 has discovered that the most hydraulically remote sprinkler heads in PF-4 will not deliver the minimum flow density specified in the original facility design and the FSAR (i.e., 0.19 gpm/ft² over a minimum of 1500 ft²). LANL asserts that the original design requirement was not based on actual risk factors, such as combustible content, and that the as-built system will deliver 0.15 gpm/ft², sufficient to meet current NFPA codes for chemical laboratories (e.g., NFPA 45, NFPA 13 Ordinary Hazard Group 1). LANL has submitted to DOE a positive Unreviewed Safety Question (USQ) based on this discovery. DOE review and action on the USQ are forthcoming.

Decontamination and Volume Reduction System (DVRS): LANL has about 2,400 m³ of TRU waste that is oversized (e.g., gloveboxes) and stored in about 300 fiberglass-reinforced wooden crates. The crates range from 10 to 40 feet in length and from 4 to 12 feet in width and height. This is a form unsuitable for shipment to WIPP. The radiological contents of about one-tenth of the crates have been well characterized. Current knowledge of the remainder is based primarily on waste generator records. LANL believes that about half the crates could be processed, one at a time, in a radiological facility (i.e., less than 8.4 gm PuE), and nearly all (95%) could be processed in a HC-3 facility (i.e., less than 450 gm PuE, 900 gm PuE for critical safe forms). A small number of crates (~14) may require a HC-2 facility, depending on results of further characterization (e.g., Pu-238 content).

To prepare this waste for shipment, LANL is proposing to start up the DVRS within the next 2 months as a radiological facility and to transition this facility in future years to HC-3 and maybe eventually to HC-2. DVRS operations will be manually intensive and involve unpacking crates, fixing or removing contamination, segregating low level waste, and packaging for shipment. Oversized components will be hoisted and lowered into a shearing and compaction machine (a car crusher) that would reduce metal objects to pucks that can be loaded into standard waste drums. The facility has several safety features including PC-2 structure, dry-sprinkler fire suppression, 2-hour rated fire walls for both bays and building, HEPA filters on bay exhaust and on building supply and exhaust, and an emergency diesel generator to ensure ventilation remains negative. As of this week, the startup team has not completed a startup plan for radiological operations (it's close) or a transition plan, safety analyses, and function classification required for later HC-3 or HC-2 operations. Without the latter, it is difficult to say now that, once contaminated, upgrading the facility to HC-3 or HC-2 operations in the future won't entail either prohibitively expensive modifications or burdensome administrative controls. Additional forethought, such as a well-developed transition plan, appears warranted.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 9, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending November 9, 2001

Critical Experiments Facility (TA-18): The site rep understands that the pace of some operations is increasing in TA-18. Earlier this week, an operator removed highly irradiated target foils from COMET, a general-purpose assembly machine, and received about 200 mrem in less than two minutes. For perspective, the total annual exposure for all facility personnel has been less than 1 man-rem. Also, next Tuesday, LANL intends to reconfigure COMET for the next series of experiments – the fourth reconfiguration this year. Normally, reconfiguration is done after a one-to-two week shutdown; however, conducting this evolution next week is expected to result in operators working in a high radiation area. Reconfiguration typically takes 1 to 3 hours. The facility is increasing emphasis on as-low-as-reasonably-achievable (ALARA) practices for these tasks.

High Efficiency Particulate Air (HEPA) Filters: TA-54 has instituted a nuclear-grade HEPA filter inspection process for the Decontamination and Volume Reduction System (DVRS) and has recently rejected 21 of an order of 59 filters received (i.e., about 35 percent rejection). The inspection criteria are based on the applicable DOE HEPA filter standards. Specifically, 12 were rejected for defects such as media deviation, gasket problems, and face-guard damage, and 9 were rejected because they were received improperly stacked on the pallets. Of particular interest, these HEPA filters had already been through and passed inspections at the vendor, at the DOE HEPA filter test facility, and at LANL receipt inspection, which raises questions at LANL and elsewhere on the consistency and thoroughness of these types of inspections.

TA-18 Flood Retention Structure (FRS): The site rep believes that DOE and LANL need to clarify responsibilities and make progress toward resolution of open issues with the FRS, including those identified in the Board letter and staff report issued this week. Some of these issues have been known for some time. Particularly, in May, DOE approved a positive Unreviewed Safety Question related to the FRS, subject to several conditions equivalent to Technical Safety Requirements (TSRs). Among these were LANL submitting to DOE a structural review, an emergency action plan, and maintenance and inspection procedures. In July and September, LANL submitted a maintenance/inspection plan and an emergency action plan. DOE action is imminent, but the site rep understands that there are issues. In August, LANL identified several key uncertainties. Among others, these included the roller-compacted concrete strength, foundation strength assumptions, and erosion controls. It appears appropriate to move quickly to address these uncertainties, finalize an emergency action plan, and implement appropriate FRS maintenance and inspection procedures.

LANL Authorization Bases (ABs): DOE and LANL have an aggressive schedule for AB upgrades during the next 6 months (site rep weekly 10/26/01). For the plutonium processing facility (TA-55), DOE has provided feedback to LANL and next week, a small, joint DOE-LANL team plans to review the current TA-55 hazard analyses. LANL intends to submit a 90% package for TA-55 in late December, receive DOE comments in February 2002, and submit the final package in April 2002. In the same time-frame, LANL will be preparing and DOE will be reviewing similar submittals for TA-18 and the Weapons Engineering Tritium Facility (WETF). Frequent positive engagement between DOE and LANL, as well as establishing a mutually acceptable resource-loaded schedule and interim milestones (such as the TA-55 review next week), could contribute to timely success.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 16, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending November 16, 2001

Radiography Facility: TA-8 Building 23 (TA-8-23) has been used since the late 1940s for non-destructive testing of high explosive (HE) and nuclear components. Overnight storage is prohibited. The facility has adequate separation from other facilities, a fire alarm system, lightning protection, x-ray machine interlocks, but no confinement features and no installed fire suppression. It also has a natural gas line to an equipment room, which needs to be considered in accident analyses.

In late 2000, DOE designated TA-8-23 as a Hazard Category 2 Nuclear Facility. At that time, a DOE-approved authorization basis did not exist. In April 2001, LANL submitted to DOE a Justification for Continued Operation (JCO). In parallel, LANL is preparing technical safety requirements (TSRs) and a safety analysis report, now at 70 percent complete. On October 29th, DOE approved the JCO subject to some conditions considered equivalent to TSRs. Among others, these include mass limits on cased HE and plutonium, as well as prohibitions on uncased HE, heat sources (Pu-238), radiography sources (Co-60), and combined HE/radioactive material operations (e.g., HE with depleted uranium). The last impacts planned operations, and DOE has suggested that LANL consider submitting an unreviewed safety question with justification. Resolution is pending.

Plutonium Handling and Processing Facility (TA-55): As of October 31st, LANL reported that about 80 percent of the TA-55 Type A corrective actions have been completed (site rep weekly 9/28/01). Some of the improvements remaining include: improving formality of operations; completing component labeling; capturing normal system lineups on system drawings; verifying actions on maintenance and testing of compression fittings and teflon seals; addressing minor-to-moderate glovebox vulnerabilities found during recent inspections; and implementing a self-assessment process to improve reliance on the skill of the worker.

While DOE and LANL have been tracking milestone completions, an independent DOE assessment and verification of closure remains to be done. Such assessments are required by DOE Order 414.1A, *Quality Assurance*, and the corresponding DOE-AL supplemental directive on corrective action tracking systems. The site rep believes that verification is overdue. DOE-AL has prepared a Criteria Review and Approach Document (CRAD) and is close to completing a verification plan based on the supplemental directive requirements. The plan still needs to be coordinated with LANL, and discussions between DOE and LANL this week indicated that there is some confusion. Tentatively, DOE believes that verification of the completed actions will be done in January.

Chemical and Metallurgical Research Building (CMR): Thursday morning, a tractor-trailer rig hauling low level waste containers had its trailer de-couple as the rig was exiting the CMR parking lot onto Diamond Drive. The trailer slid back about 10 feet and landed on its front leg supports. Radiological controls and security personnel responded appropriately. The trailer was found to be mechanically sound. There was no release of radioactivity from the containers, and they have been moved to TA-54. LANL is

investigating to determine the cause of the event.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 14, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 14, 2001

LANL Authorization Bases (ABs): The AB upgrade schedule is aggressive. The LANL resubmittal for the Weapons Engineering Tritium Facility (WETF) appears to be the highest priority and is expected in late January 2002 (site rep weeklies 11/23/01, 9/28/01).

Plutonium Handling and Processing Facility (TA-55): The following are noteworthy:

- c The ventilation ductwork between the exhaust filter plenums and the building structure is considered to be a Safety Class design feature to prevent an accidental release. The site rep understands that duct inspections done several years ago identified minor internal surface corrosion but that nominal wall thickness was basically the same as during construction. During the next two months, the facility intends to develop a routine preventive maintenance program to monitor the condition of the Safety Class ductwork. The program is currently envisioned to be a visual and an ultrasound inspection every one and five years, respectively.
- c Recently, there have been several contamination events in the aqueous processing operations, including one skin contamination. Several of the events are attributed to service-life failures. The facility has concluded that an increased emphasis on engineered barriers, plant maintenance, and radiological controls practices is warranted. Management has reviewed the events, lessons-learned, and expectations with personnel. Also, work area supervisors are assessing process equipment age, reliability, and risks to identify improvements.

These initiatives are commendable. The site rep believes that the increased, complex-wide emphasis on facility infrastructure and vital safety systems (e.g., Recommendation 2000-2) has raised awareness. In this context, the facility itself – particularly, the facility management and the DOE facility reps – self-identified the specific issues leading to these initiatives. Resources required and available are to be determined.

Decontamination and Volume Reduction Facility (DVRS): System testing and questions on startup requirements have delayed the LANL and DOE readiness assessments (RAs) for DVRS at least a month (site rep weekly 11/2/01). The LANL RA was scheduled to occur this month. The advantage of expeditious startup is timely reduction of TA-54 combustible loading. The disadvantage is that the currently proposed startup strategy could potentially allow incompletely characterized packages to be opened in the facility, leading to unanalyzed conditions.

The basic question is the chemical and radiological hazard categorization at initial startup. LANL has proposed that the facility be started up as a low-hazard, radiological facility and in a year or two transition up to Hazard Category 3 (HC-3), and possibly HC-2. However, recent LANL analyses has reduced by half the number of packages that may be processed before the facility transitions to HC-3. At this time, the project lacks completed safety analyses and functional classification that would support a HC-3 startup. They have drafts. The site rep is still looking for a systematic transition plan to HC-3 and a conservative set of controls on source term, safety equipment, and procedures in the interim. Some but not all of these elements are in place. DOE is reevaluating the startup strategy.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 21, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 21, 2001

Staff member C. Coones was on site this week reviewing the TA-55 fire suppression system.

Plutonium Handling and Processing Facility (TA-55): The TA-55 fire suppression system is safety significant because it protects workers and provides defense-in-depth for safety class systems. The staff has observed that a number of questions linger on the system (e.g., site rep weekly 12/7/01). Recently, DOE and LANL have been working to address these. DOE and LANL agree that more information is needed on the sprinkler system, fire pumps, and storage tanks, and that timely resolution is required to support the TA-55 Authorization Basis resubmittal in April 2002.

At this time, DOE and LANL believe that there are no imminent safety concerns that warrant operational restrictions. Current information indicates that 2 of about 20 sprinkler heads in the most hydraulically remote north-side room would have major flow degradation (~18%) and 3 others would have slight degradation (3%). The symmetrically located south-side room may also have a similar number of heads with degraded flow, but that remains to be evaluated. Transient combustibles in these spaces are low, based on monthly surveillance. Three of the four fire pumps deliver required flow at pressure. The fourth will be tested within the next few weeks. Questions on pump suction head, minimum storage tank level, and HEPA filter cooldown spray requirements all need to be addressed.

LANL believes that there are no design impacts on the fire loop replacement project as a result of updating internal fire suppression requirements. LANL has asked the project to update the flow analyses, using the revised assumptions, and determine the pump characteristics that could be the basis for the new Technical Safety Requirements. The staff believes that flow analyses of interim configurations, such as during system tie-in and pump house upgrades, are also warranted to ensure adequate interim fire suppression is available.

Decontamination and Volume Reduction System (DVRS): This week, DOE withheld concurrence with LANL categorizing DVRS as a low hazard, radiological facility (site rep weekly 12/14/01). Both the chemical and radiological hazards require further assessment. DOE observations included the following: (a) the proposed categorization was incorrectly based on mitigated consequences (e.g., it credited fire suppression); (b) the analysis did not consider accident consequences from explosive hazards that LANL indicated may be present; (c) cited radiological inventories were inconsistent; (d) significant, non-conservative uncertainties may exist in the currently projected container inventories, possibly by up to an order of magnitude based on comparisons of historical records to modern assay results; and (e) worker hazards, such as falling into the shear bailer, were not addressed. Based on these observations, it appears that there may be a further reduction from earlier estimates of the number of containers that can be processed before the facility transitions up to Hazard Category 3.

DOE requested LANL to resolve these issues and hold a formal comment disposition meeting in January to expedite hazard categorization.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 28, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 28, 2001

The laboratory is closed from Tuesday, December 25, to Wednesday, January 2.

Plutonium Handling and Processing Facility (TA-55): LANL is close to completing the installation of the Pu-238 Scrap Recovery Line, a new aqueous processing line for recovering and purifying Pu-238 oxide. The objective is to be able to produce ½ kg Pu-oxide per month, 10 months per year. This is a batch process with a separate glovebox being used for each major unit operation: comminution (ball milling), nitric acid dissolution, anion exchange, oxalate precipitation, hydroxide precipitation, filtration, and calcination/oxygen-16 exchange (calcination is at 750 °C for 2 hours). The gloveboxes are normally sealed from each other. Transfers are made via tubing for solutions and via covered metal containers and pass-through doors for solids.

When operational, the Scrap Recovery Line will be a Hazard Category 2 activity based on the Pu-238 inventory. Per DOE direction, the safety class controls include an inventory administrative limit and specifications for the anion exchange resin on type, shelf-life, dry-out restrictions, and recovery/render-safe processes. These controls are in addition to the normal safety class features for Pu-238 operations (i.e., building structure, filter plenums, connecting ductwork, and seismically qualified gloveboxes). Safety significant features include the covered metal containers for moving solids and the stainless steel mesh that surrounds each anion exchange column. DOE also is requiring LANL to develop a TSR-level control on transient combustibles within the glovebox line, as well as safe handling procedures for certain chemicals used in the process.

Currently, LANL anticipates a management self-assessment in February, the LANL readiness assessment in March/April, the DOE readiness assessment in June, and startup by August.

TA-18 Flood Retention Structure (FRS): DOE has obtained from the Army Corps of Engineers a proposal to undertake activities necessary for resolving open issues with the FRS, including those identified in a Board letter and staff report in November (site rep weekly 11/9/01). The proposed activities include performing a baseline FRS inspection, core drilling and testing the roller compacted concrete and underlying foundation material, and preparing a concrete materials and foundation completion report. DOE action on the proposal is imminent. These activities also support the turnover of FRS responsibilities from the Corps to DOE and LANL. Timely resolution of these issues continues to be warranted, as well as finalizing the FRS emergency action plan and FRS maintenance and inspection procedures.

Transuranic Waste Inspectable Storage Project (TWISP): Last week, TWISP retrieved its last waste drum, reaching this milestone two years ahead of schedule and \$13M (26 %) under-budget. Since 1995, TWISP has retrieved about 17,000 drums and 200 fiberglass reinforced plywood crates in TA-54. The containers had been stored for nearly two decades in dense-packed arrays on asphalt pads under plywood, plastic, and earthen cover. Retrieval operations were conducted using a Hazard Category 2 safety basis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 4, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 4, 2002

The laboratory reopened on Wednesday, January 2, from the holiday recess.

DOE Independent Oversight Review: The DOE Office of Independent Oversight and Performance Assurance (DOE-OA) is planning an on-site evaluation in early Spring, covering Integrated Safety Management (ISM) core functions, the safety management system, the emergency management program, and the functionality of a selected essential safety system (e.g., Recommendation 2000-2).

In preparation, a DOE-OA team will be on site next week for a scoping visit, which will be focused on the following areas: ISM accomplishments, changes in emergency and environmental management as a result of the Cerro Grande Fire, LANL institutional actions as a result of the TA-55 Type A event, lessons learned from Recommendation 2000-2 reviews, and contract changes related to safety improvements (e.g., implementation of the DOE Conduct of Operations order, 5480.19). DOE-OA team members are also scheduled to walk down the ventilation system for the Chemistry and Metallurgical Research Building (CMR). The CMR ventilation system is currently not on the list for 2000-2 Phase 2 reviews (site rep weekly 12/7/01).

Emergency Operations Center (EOC) Replacement Project: The design for the EOC replacement project is currently at 60 percent with anticipated completion in July 2002. This project is an FY 01 line item intended to address emergency management issues identified during the May 2000 Cerro Grande Fire. In October 2001, DOE approved LANL pursuing a design-build strategy (site rep weekly 10/12/01). Currently, the new EOC is envisioned to be a two-story building, nearly 38,000 ft², that will consolidate LANL's emergency management and response activities, as well as Los Alamos County Fire, Police, and 911 dispatching. The dispatching center will be continuously manned. Besides EOC and dispatching, the building would include space for telecommunications, a standby diesel generator, uninterruptible power supply, boilers, chillers, other electrical/computer equipment, and a large garage for emergency vehicles. Building construction would consist of a cast concrete foundation, grout-filled masonry walls, and metal/concrete decks for the 2nd floor and roof. Ground-breaking and construction start is expected within 3 to 4 weeks.

LANL Authorization Bases (ABs): In mid-December, LANL submitted to DOE a new master schedule for delivering upgraded AB documentation for both nuclear and non-nuclear facilities (site rep weekly 11/23/01). The new schedule reflects the increased workload to improve analyses, as well as the additional time for LANL quality assurance and management review. The initial submittal will be for the Weapons Engineering Tritium Facility (WETF) later this month, followed by the Critical Experiments Facility (TA-18) in mid-March and the Plutonium Handling Facility (TA-55) in early April. After that, major submittals for the remaining nuclear facilities without current ABs are expected at a pace of about one per month through January 2003. DOE and LANL appear focused on timely delivery, review, and approval of high-quality safety analyses. Close attention to this is required to ensure each of these facilities is able to safely operate within a well-understood safety envelope and efficiently accomplish its national security mission.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 11, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 11, 2002

Facility Operations and Maintenance: This week, LANL announced its intention to compete the laboratory's maintenance and services contract, which has been held by Johnson Controls Northern New Mexico (JCNM) since 1997. Current contract value is about \$145M. In the announcement, LANL indicated that the contract needs to be competed in keeping with the recent operations realignment and the different approach being pursued for facility operations and maintenance.

Chlorine Dioxide Event: On Tuesday, an uncontrolled energetic reaction occurred in a non-radioactive chemical laboratory in TA-54 West. The laboratory is in the same building as a component decontamination shop (e.g., for respirators). The site rep understands that two researchers were working to develop a chloride dioxide hydrate that could be safely packaged, transported, and stored when one observed an unexpected temperature increase and both began to evacuate the room.

The subsequent reaction ruptured and plastically deformed a 3,000 psi-rated pressure vessel, destroyed a fume hood, and generated energetic missiles that perforated walls and caused significant damage. Due mostly to their alertness and quick action, the two researchers escaped without serious injury. The site rep believes that appropriate immediate and supplemental actions were then taken, including timely communications to workers and the public of the nature of this event. LANL has initiated an investigation. At this stage, DOE and LANL are asking the right questions about work authorization, hazards communication, hazard analysis, and implementation of controls.

Critical Experiments Facility (TA-18): On Wednesday, the TA-18 Facility Manager suspended operations of PLANET due to a reliability issue with the antiquated reactivity control system. PLANET is a general purpose vertical assembly machine used frequently for criticality training. Criticality is achieved by stacking enriched uranium plates on a fixed upper platform and a movable lower platform. The latter is positioned by a hydraulic lift and a fine-control stepper motor.

This week, during maintenance on the stepper motor control system, the lower platform began to rise toward the upper platform without operator action. Since the assembly had been unstacked to half that required for criticality, personnel safety was assured before the maintenance began. However, this is the fifth failure of this control system in the last 7 weeks. In the other cases, the control system failed to move the lower platform on command; however, in this case, the platform appears to have moved on its own. No critical operations were done in the time between the first and the final failure. To address the reliability issue, LANL plans to install a new control system, potentially resulting in a 2 to 4 month impact on related programs.

Quality Assurance: LANL has several initiatives underway to improve safety, quality, project management, and formality of operations. Many of these resulted from internal LANL reviews and external reviews by DOE, the Board, and other organizations (site rep weekly 8/17/01). In the past, LANL has astutely identified problems and creatively developed solutions but has had difficulty in instituting lasting change. The site rep has observed that progress appears to be occurring now in formality of operations, but early steps to achieve institutional quality assurance improvements have not materialized as expected. This may warrant increased management attention.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 18, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 18, 2002

The site rep was at DNFSB-Headquarters in Washington D.C. this week. This report filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 25, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 25, 2002

Chemistry and Metallurgical Research Building (CMR): This week, CMR management curtailed operations, since CMR has had 7 contamination events so far this month, 6 of which occurred in the last two weeks (4 bootie, 2 personal article, and 1 skin contamination). This is prudent. Each of these events individually involved low risk; however, collectively, they could be viewed as precursors to a potentially more significant future event. Contamination control is a recurring problem in CMR due to legacy contamination, increased workload, and occasional poor work practices in unforgiving radiological conditions (e.g., researchers working with contaminated hoods). Last September, CMR provided DOE an action plan to reduce the number of contamination events in the long term. Key elements included changing worker behavior and awareness (e.g., peer review, recognition of good practices and habits); reviewing the history and condition of individual rooms (e.g., legacy contamination); and clarifying personnel protective equipment requirements (e.g., use of gloves). This is a good start. The issue warrants continuing close management attention in detail to execution.

Decontamination and Volume Reduction System (DVRS): DOE and LANL have agreed upon a path forward to start up the DVRS as a radiological facility, process a small number of the fiberglass-reinforced crates with low TRU waste inventory, and then transition the facility to Hazard Category 3 (HC-3) operations. The possibility remains that a small number of packages may have inventory exceeding the HC-3 threshold and will require processing, in future years, in either a HC-2 facility or in DVRS with appropriate short-term compensatory measures (site rep weeklies 11/2/01, 12/21/01).

The Inventory Control Plan considers startup in 3 phases: (1) cumulative inventory of containers processed not to exceed 85% of the HC-3 threshold; (2) additive inventory not to exceed the HC-3 threshold, based on subtracting out assayed waste streams; and (3) full HC-3 operations with appropriate controls. Readiness assessments (RAs) would be performed before Phases 1 and 3. The site rep understands that shear-bailer operations (e.g., for glovebox size reduction) will not be permitted until HC-3 operations are authorized. One clear advantage of this approach is the early experience that will be gained by starting on the low activity packages. Thorough RAs are advisable to assess preparations for these manually intensive radiological operations. The pre-RA management self assessment is scheduled to begin next week.

Chlorine Dioxide Event: LANL is investigating the vessel rupture event of January 8th using methodology from the DOE accident investigation guide (G 225.1A). DOE has a representative working with the LANL team. The site rep understands that the team is approaching this investigation with a level of rigor equivalent to a Type B accident and has targeted having a draft report for factual accuracy review within the next two weeks (site rep weekly 1/11/02).

LANL Authorization Bases (ABs): This week, LANL submitted to DOE the proposed authorization basis for the Weapons Engineering Tritium Facility (WETF). This is the first major AB submittal under the new master schedule and should be a good test case on whether DOE and LANL have improved their processes for delivery and approval of major safety analyses (site rep weekly 1/4/02).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 1, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 1, 2002

Bamdad, Jordan, and Martin were on site this week reviewing TA-18 activities.

Critical Experiments Facility (TA-18): TA-18 has unique capabilities and personnel with unique expertise to support criticality safety training, emergency response, nuclear non-proliferation, arms control, and stockpile stewardship. DOE is pursuing relocating TA-18 capabilities, because its facilities are 30 to 50 years old and are increasingly expensive to maintain and operate (e.g., annual security and operating costs have escalated at a rate of 16 % per year during the last five years).

In a letter to the NNSA Administrator this week, the LANL Director expressed strong support to relocate the TA-18 mission to a new facility designed to meet today's requirements. The letter emphasized that many of these activities have grown significantly since September 11th. The letter states that both CMR replacement and TA-18 mission relocation are urgently needed in the near-term, and construction should start as soon as possible since neither facility can be safely and securely operated beyond 2010. A final environmental impact statement for TA-18 mission relocation is expected imminently, leading to a record of decision in March. LANL is developing a transition plan and has a conceptual design effort underway to facilitate comparison of alternatives. To date, LANL has been thorough in close-coupling preliminary safety analyses with the design activities. If the preferred alternative is chosen (TA-55), preliminary design would start in late Spring.

While the emphasis now is encouraging, TA-18 mission relocation is years away, and recent events indicate that current TA-18 operational and safety infrastructure needs to be improved. For example, three of five critical assemblies are now shutdown, hindering operations. PLANET was shut down last month and will require a 2 to 4 month unanticipated outage to replace antiquated control equipment (site rep weekly 1/11/02). SHEBA has been shut down since September 2000 because of an unacceptable potential for flammable gas buildup in the vessel head space (DOE does not currently plan to relocate SHEBA). Facility management has observed that a carefully planned path forward exists to restart two assemblies (FLATTOP and SHEBA) and has expressed confidence in the two currently operating machines (GODIVA and COMET).

TA-18 also has had several Technical Safety Requirement (TSR) violations in the last year, due in part to operator inattention and to a diffuse authorization basis that is scheduled to be upgraded within months (site rep weekly 11/30/01). Last week, the facility reported a Technical Safety Requirement (TSR) violation involving plutonium oxide material brought on site for a limited term project in June 2001. The material was still on site past November 2001, exceeding the period authorized by DOE.

Collectively, these and other issues may indicate a potential need for an operational assessment, leading to a prioritized list of improvements that need to be made to support TA-18 safely and efficiently performing its National Security mission until the replacement project is completed. LANL has implemented a similar limited-upgrade program at CMR that has increased short-term confidence in the safe operations of that facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 8, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 8, 2002

Weapons Engineering Tritium Facility (WETF): WETF has had two events in the last two weeks that indicate that improvements are needed in emergency response planning and training, facility preventive maintenance, and system checkout before gas transfers. This week, operators transferred gas to an unintended location because of an incorrect system alignment. There was no release. Recurrence could be prevented by an independent verification of system alignment before transfers.

Last Wednesday, WETF released about 175 Curies of 1% oxidized tritium to the environment while responding to a system leak into a glovebox and from there into a process room. While the consequences were minor (1 mrem or less), the lessons are important. During the event, the installed glovebox tritium monitor saturated. The facility then connected a high range portable monitor, which in turn not only saturated but also leaked – significantly increased the release to the room. In hindsight, attaching the portable monitor could not have provided useful information. Before it was connected, the glovebox was performing its confinement function. The facility later determined that, during this period, tritium levels in the room were about 7 orders of magnitude lower than those in the glovebox. Also, the two leaking fittings are similar and susceptible to improper connection or being loosened by line vibration. The event might have been prevented by either a periodic tightness check of installed fittings or an integrity check on the gas transfer path before the transfer. Currently, WETF does rate-of-rise integrity checks on lines when modified. Implementing both practices may be worth pursuing. After this week's event, WETF curtailed operations. The facility has done a good job investigating these events and needs to be thorough in following up on lessons learned.

Preliminary Functional Classification: Engineering design and safety analyses need to be tightly coordinated, whether designing a new facility or modifying an existing one. Preliminary function classification (PFC) is a primary interface mechanism for achieving this integration. PFC involves an early and recurring identification of potential engineered safety features and systems. It forms the rational basis for proceeding with design. PFC may initially be based on analyses from older facilities or on engineering judgement arising from, in some cases, up to five decades of relevant experience.

In four recent projects reviewed, there appears to have been little to no effort or intent to establish functional classification, including PFC, in advance of the final accident analyses, which can be years away. In fact, there is resistance to this approach because, if engineering judgement or early analyses prove wrong, then PFC may have missed important safety systems, or project funds may have been expended on systems that are later concluded not vital to safety.

The site rep believes that there needs to be a greater effort in LANL projects to formally establish early and iterate on a reasonably conservative set of potential safety systems, in advance of final accident analyses. The risks of using the PFC process can be addressed by timely iteration and active programmatic risk management. If managed, these risks can be less than those posed by not using the PFC process, which could lead to a major iteration late in detailed design, a major unanticipated upgrade, or a major reconstitution of system pedigree. What often occurs in these cases is that the design or facility is not corrected. Instead, the project defaults to using administrative controls over engineered safety features. This can be avoided by a proper, balanced use of the PFC process.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 15, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 15, 2002

Critical Experiments Facility (TA-18): Flattop, a spherical benchmark critical assembly, has been shutdown since February 2000, except for one special DOE-approved test. Last month, LANL submitted to DOE a positive Unreviewed Safety Question Determination (USQD) involving a Flattop interlock that is described in the safety basis but does not exist. The interlock was intended to prevent resetting the SCRAM unless the three control rods are fully retracted (their minimum reactivity position). As is, an inexperienced operator could quickly reset the control system after a SCRAM, move the safety blocks in while control rods are partially inserted, and cause an unanticipated criticality, albeit with lower reactivity than existed before the scram. Rather than install the interlock, LANL proposes adding a TSR administrative control that cautions operators not to reset the SCRAM before the control rods are fully retracted. DOE action is forthcoming.

The site rep understands that this discrepancy was first recognized in February 2000; that the missing interlock was one of eight Flattop discrepancies described 19 months ago (July 2000) in a LANL evaluation of the authorization basis design configuration; and that Flattop has operated once during this period (August 2000), which was for a special test to resolve a safety basis question on the reactivity insertion rate of the safety blocks. DOE and LANL are pursuing questions raised by these events, including timeliness and coordination among safety basis activities. Site rep weeklies, dated 1/11/02 and 2/1/02, discusses related issues.

Facility Management: LANL is pursuing standardization of practices and consolidation of facility management units. Overall, these developments are positive; however, the resulting realignments and other changes will have safety implications. As part of this effort, clarifying and strengthening the facility manager's role may be appropriate. A facility manager is in a unique and challenging position that, in many organizations, carries responsibility for all activities within the facility. His or her chances of success improve if the facility's boundaries are well-defined and manageable in scope. The facility manager then needs necessary and sufficient authority to meet these responsibilities, as well as full organizational support from above and below. Reenforcing the facility manager's role can improve efficiency and effectiveness, which will also improve safety.

Work Controls: LANL is piloting an expanded skill of the craft (SOC) approach for work control that will reduce the requirement for task hazard analyses (site rep weekly 9/14/01). LANL defines SOC work as discrete tasks to be done by either a qualified craftsman with the expertise to identify and control the hazards or by workers using a written procedure that specifies the hazards and controls. No separate, formal task hazard analysis is done when work is authorized as SOC.

The expanded approach moves away from authorizing SOC tasks by specific task type to controlling it by worker qualification (i.e., a controlled qualification criteria checklist). Preliminary feedback from the pilot includes: "facility coordinators find the [SOC approach] much more efficient to be able to provide input to the process by simply declaring work to be SOC; the craft and/or zone management then concur or amend as necessary." While some craft work can probably be safely and efficiently performed using this approach, there also appears to be cases where a simple craft evolution might have unforeseen consequences on operations and safety unless it is properly reviewed and controlled.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 22, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 22, 2002

Weapons Engineering Tritium Facility (WETF): WETF resumed gas transfer operations last week (site rep weekly 2/8/02). Corrective actions included implementing an independent verification of valve positions for tritium container loading and unloading operations, as well as a thorough rate-of-rise integrity check for gas transfers of more than 1 gram. After 30 days, the facility will reevaluate these actions. WETF is also pursuing a locking device to prevent the mechanical fittings from loosening and is evaluating potential preventive maintenance improvements for fittings and valves. The site rep believes that these are appropriate followup actions to the events reported earlier this month.

Radiography Facility: TA-8 Building 23 (TA-8-23) is a 1940s era building that is used for nondestructive testing of high explosive (HE) and nuclear components. In late 2000, DOE designated TA-8-23 as a Hazard Category 2 nuclear facility, although this facility did not have a DOE-approved authorization basis (AB). In October 2001, DOE approved a Justification for Continued Operations (JCO) for TA-8-23 subject to conditions considered equivalent to Technical Safety Requirements (TSRs). Among those was a prohibition on combined HE/radioactive material operations (site rep weekly 11/16/01). In December 2001, DOE approved a limited-term JCO that permitted radiography of two assemblies of combined HE/radioactive material (site rep weekly 12/7/02). In January 2002, DOE approved a JCO addendum that removed this restriction.

On February 14th, LANL completed a TA-8-23 readiness assessment (RA), which reported several post-start findings. Among these is the facility's backlog of unreviewed safety questions (USQ). The RA report states that AB staffing may not be adequate to keep up with the work load for a new Hazard Category 2 Facility. The LANL master schedule for AB upgrades indicates that LANL will submit a 10CFR830 compliant safety basis for TA-8-23 by May 30th. This may become challenging if the USQ backlog and facility AB staffing issues are not addressed.

Emergency Exercise: On Wednesday, DOE (SO-40) conducted a mid-day, no-notice emergency exercise at LANL, based on a postulated glovebox fire in the Chemistry and Metallurgical Research Building (CMR), Wing 5. Facility actions and external notifications were simulated. The Emergency Operations Center (EOC) was fully activated in about 20 minutes of initiating recall. Based on the information available, the postulated event was categorized as a Site Area Emergency, as expected, a few minutes after full activation.

The site rep observed the exercise from the EOC. Overall, the EOC response was proficient. The May 2000 Cerro Grande Fire experience is still fresh. Information management in the existing EOC is challenging. While facility condition reports were timely, the site rep believes that the EOC should have had quicker access to information on personnel accountability, affected room location, room radiological and chemical inventory, and any injuries or contaminated personnel. Information management should improve when the new EOC is completed (preparation of the construction site is underway). The DOE (SO-40) exercise assessment is expected in about one month.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 1, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 1, 2002

Staff Reviews: The site rep attended a Standing Management Team meeting at Pantex this week to determine the status of laboratory support for Pantex operations. Boyd, Feldman, Jordan, and Von Holle were at LANL this week reviewing chemical safety. The staff team was briefed on the status of the nearly completed LANL investigation of the chlorine dioxide explosion (site rep weekly 1/11/02). Boyd and Jordan also observed nuclear chemistry research operations in TA-48, and CMR.

Plutonium Handling Facility (TA-55): The Fire Protection Yard Main Replacement Project is intended to replace the leaking fire water loop and improve its reliability (site rep weekly 11/23/01). Progress has been slow but deliberate. The construction force began fusing the main body of the first replacement piping section in early February. Last weekend, the first section was successfully hydro-tested. A DOE readiness assessment began this week, focused on tie-in preparations and implementation of controls (e.g., controls to minimize periods of increased risk, such as during a confinement breach). Tie-in of the first section could occur as soon as next Friday (March 8th), following the readiness assessment and a series of flushes.

Weapons Engineering Tritium Facility (WETF): DOE review of the LANL proposed WETF safety basis continues (site rep weekly 1/25/02). The staff is reviewing it in parallel. LANL identified the safety class features as the facility structure, tritium containment vessels, and Pu-238 sealed sources (used for calibrating calorimetry). The proposed safety significant features include: tritium monitoring, gas containment, gas handling, and waste treatment; fire protection; environmental chamber over-temperature protection; glovebox inert and oxygen monitoring; and the uninterruptible power supply for monitoring systems.

Decontamination and Volume Reduction System (DVRS): This week, the staff (Boyd, Jordan, Keilers) toured DVRS and discussed preparations to first start it up as a radiological facility and later transition to a Hazard Category 3 (site rep weekly 1/25/02). The staff learned that shear-bailer operation could occur prior to that transition. Also, the facility is pursuing the possibility of using glovebox decontamination processes developed and used at Rocky Flats.

DVRS will require manually intensive radiological operations and warrants a rigorous startup process. A facility management self-assessment (MSA) began on January 25th. The facility manager prudently suspended it a week later due to equipment and procedure problems. The MSA is now expected to restart in mid-March and will be followed by LANL and DOE readiness assessments. Because of the unique startup strategy being pursued, the DOE Site Office Manager (acting) is the startup approval authority.

Critical Experiments Facility (TA-18): LANL is poised to begin a readiness assessment next week for relocated storage of Special Nuclear Material, subject to resolution of seismic robustness questions and DOE approval of the hazard analysis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 8, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 8, 2002

Boyd, Contardi, Hunt, Kasdorf, Leary, Malen, Plaue, and Wong were on site this week reviewing operations, 94-1 progress, inactive nuclear material storage, and the new scrap recovery line.

Plutonium Handling Facility (TA-55): The staff reviewed startup preparations for the Pu-238 scrap recovery line (site rep weekly 12/28/01). Startup is scheduled for August. The staff found the project team technically very competent, and the project proceeding in a deliberate manner. The staff raised questions on the formality of the safety basis controls, project management, and operator training, as well as on the technical basis of certain design features credited in the safety basis.

Recommendations 94-1 /2000-1: LANL discussed with the staff a new draft stabilization and packaging baseline sent to DOE last week. By the draft, LANL would qualify workers during the next 2 years, process most materials between 2004 and 2008, and complete processing in 2009. After rampup (2004), the processing schedule appears aggressive. Key assumptions are not yet documented.

LANL also indicated that safe, secure vault storage on site is near capacity and needs to be carefully managed and improved on to support current operations. Shipments off site are limited by restrictions on shipping containers and receiver sites. On-site storage demands will likely increase to support future missions and other needs. For example, DOE tasked LANL in December 2001 to identify and establish storage in FY 02 for about 350 sealed Pu-239 neutron sources that may prove difficult to disposition. Progress on 94-1 (e.g., Pu stabilization and packaging, residue disposition) would permit more efficient storage and free up vault space. Therefore, DOE and LANL would likely benefit from both a safety and a mission perspective if 94-1 objectives were vigorously pursued.

Critical Experiments Facility (TA-18): During the review of inactive TA-18 materials, LANL discussed with the staff about 30 poorly characterized drums of predominantly uranium and about 2 dozen potentially embrittled plastic containers of excess uranium solutions. Accelerated characterization and disposition of these materials appears warranted.

Also this week, the readiness assessment for the special nuclear material (SNM) relocation project was completed. A large inventory of SNM was relocated Thursday. DOE approved the project's safety basis, subject to review and approval of the seismic analysis and installation of any seismic anchorage or supports required on or before March 29th. During a tour, the staff observed anchorage embeds already being installed. The staff will review the seismic analysis when it is available.

Conduct of Operations: Properly preparing and validating procedures and then performing procedures as written are key elements of conduct of operations, which LANL has committed to implement in FY 02 (site rep weekly 8/31/01). The LANL Director has set an expectation that the quality of LANL operations match the quality of its science and technology. Last week, the staff observed programmatic personnel in a facility not performing a procedure as written. The responsible group is now pursuing validation of its procedures prior to their next performance. It may be worthwhile for other groups to consider verifying that their procedures can be and are being performed as written, as part of implementing conduct of operations into programmatic work.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 15, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 15, 2002

LANL Authorization Bases (ABs): This week, LANL proposed to DOE a new TA-18 authorization basis, which applies to the Critical Experiments Facility. The improved AB ought to address some operational issues seen in the last year. This is the second major AB submittal under the new master schedule. DOE action is forthcoming on the WETF submittal (site rep weeklies 1/25/02, 2/15/02).

Tritium Operations: Last Monday (3/4/02), tritium contamination up to 200,000 dpm/100 cm² was detected in uncontrolled spaces in the Tritium Systems Test Assembly Facility (TSTA), including the shoes of four personnel. TSTA is a Hazard Category 2 (HC-2) facility in TA-21. There were no continuous air monitor (CAM) alarms during the event. The contamination was traced to an area where process piping had earlier been removed from a glovebox inside a radiological buffer area. Local tritium contamination levels were up to 12 million dpm/100 cm².

It is not clear yet why this loss of contamination control occurred. LANL is in the process of removing contaminated equipment from TSTA in an effort to reduce source-term, downgrade TSTA to a radiological facility in 2003, and eventually inactivate the facility. The site rep understands that equipment has been removed from several gloveboxes recently without a problem, and that facility operations personnel are investigating why this event happened.

Plutonium Handling Facility (TA-55): On Wednesday, an alpha contamination event occurred in TA-55 that led to CAM alarms, two personnel with positive nasal smears, and one with skin contamination. Bioassay results are forthcoming. The event occurred when an employee removed copper vacuum tubing from a plastic waste bag and began cutting out lead-solder fittings so that the tubing would not need to be disposed of as mixed waste. The tubing was contaminated and had been previously removed from a glovebox being decommissioned.

LANL is still investigating this event and is already taking appropriate action to prevent recurrence. At this point, division management believes that personnel may not have been performing work per the applicable hazard control plan and radiological work permit and that there may have been shortcomings in training and supervision. As a result, management has stood down the team involved with the job, pending approval of a corrective action plan; directed a group all-hands meeting to discuss the event and lessons learned; and taken action to improve direct supervision and daily communication and feedback from workers on job hazards and work authorization. The site rep understands that, longer term, the facility will look at the effectiveness of worker training. LANL plans dramatic increases in staffing in this area during the next year.

Dynamic Experimentation: This week, the site rep toured a TA-16 assembly building that used to be a HC-2 facility (2000), was derated, and is expected to be declared a "temporary nuclear facility" intermittently, beginning several years from now. The facility is structurally robust. Equipment appears well-grounded. Housekeeping and combustible control look good, but fire protection (e.g., sprinkler head type) and seismic support of overhead appurtenances may warrant examination. It would be worthwhile to resolve these issues and put in place appropriate configuration management and maintenance well in advance of any future readiness assessment for nuclear operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 22, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 22, 2002

Tritium Operations: LANL is considering improvements in contamination control and monitoring in tritium facilities as a result of the uncontrolled contamination in the Tritium Systems Test Assembly Facility reported last week. LANL has indicated that thorough contamination controls are warranted for tritium system maintenance and modifications because tritium surface contamination is difficult to quickly detect. Per the facility, smear surveys were done following the job in question, and these did not detect the elevated levels. Instead, they were discovered later during a daily smear survey. The contamination had spread sufficiently that it took about a week to clean up. Possible improvements mentioned include increasing use of booties; placing a removable surface around any glovebox that has been opened; and investigating use of more-sensitive, real-time surface contamination monitors.

Plutonium Handling Facility (TA-55): Contamination control in TA-55 may warrant increased attention, particularly in the process chemistry area. Last Friday, an elevated weekly fixed head airborne sample was reported for one room in this area. The site rep understands that this has been traced to a single particle on the sample, possibly dispersed by nearby maintenance in a normally inaccessible raceway. On Saturday, workers in another room were conducting a radiological survey and discovered a brown spot where a line attaches to the top of a glovebox. Workers measured 0.5 million dpm alpha on a wet cheesecloth that had been swiped over the brown spot, and they left the room. There were bootie contaminations from this event but no continuous airborne alarms. Nasal smears were negative. Workers subsequently covered the dark spot, decontaminated and surveyed the room, and released it for operations. There may be similarities between these events and those reported in site rep weekly 12/14/01. Corrective actions discussed at that time may need reemphasis.

Critical Experiments Facility (TA-18): Last week, LANL issued a Planet Control System Design Document, describing changes being made to address reliability issues (site rep weekly 1/11/02). The key changes appear to be replacing the early 1980s vintage computer, motor controller, and amplifier with modern components similar to those used in SHEBA and Comet; shifting the platen motor power source from building power to the more-restricted, Plan 3 AC power; and making the watchdog feature that detects a computer hang-up a stand-alone function, thereby eliminating a failure mode.

DOE Independent Oversight Review: On Monday, the DOE Office of Independent Oversight and Performance Assurance (DOE-OA) began an on-site safety and emergency management inspection, which will last two weeks (site rep weekly 1/4/02). The inspection team has about two dozen members. The inspection plan emphasizes assessing DOE and LANL management performance, local self-assessment processes, and feedback and improvement mechanisms. The team is observing facility operations, primarily in the Chemistry and Metallurgical Research Building (CMR) and the Radiological Liquid Waste Facility (TA-50). It is also reviewing the functionality of selected essential safety systems (CMR fire protection and ventilation), as well as environmental protection, monitoring, and waste management. Emergency management is also being assessed by a program review and tabletop exercises involving key LANL emergency response personnel. DOE-OA plans to deliver a draft report to the site in mid-April and should have a near-final draft by the end of April.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 29, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 29, 2002

Von Holle and Martin were on site this week attending the Enhanced Surveillance Campaign 2002 Review. They also met with LANL personnel to discuss the W78 disassembly process at Pantex.

DOE Independent Oversight Review: The DOE Office of Independent Oversight and Performance Assurance (DOE-OA) completed their on-site review this week. The inspection team mentioned numerous findings, both positive and negative, during daily management briefs. From these discussions, the site rep believes that some of the more significant improvements needed are in the areas of DOE and LANL issue management and formality of self-assessments, DOE local subject matter expert staffing, LANL work control via work packages and operating procedures, DOE and LANL emergency management training, and timeliness for emergency management decisions.

In the area of vital safety systems, the team complemented the Chemistry and Metallurgical Research (CMR) Facility on improved configuration management but considered that more work is needed on the maintenance backlog, fire suppression analysis (e.g., water-hammer in external supply), and use of system engineers. The inspection team will return to validate findings the week of April 8th.

Recommendation 2000-2: The first DOE-LANL Phase II assessment begins next week (site rep weekly 12/7/01). It will cover the LANL institutional maintenance program and last about one month. The site-wide fire protection review starts the following week, and that will be followed by Phase II assessments for the Plutonium Facility (TA-55) fire alarm system, and the Radiochemistry Laboratory (TA-48) fire suppression system and confinement ventilation.

At this point, the maintenance review is the only one that appears to have a specific assessment plan developed. It will focus, at least initially, on TA-18 and CMR. The latter was just reviewed by DOE-OA during the last two weeks. The site rep believes that this team will bring a different perspective and perhaps more detailed knowledge of LANL maintenance practices and facilities. That said, it appears that DOE and LANL could improve coordination of these types of reviews.

Critical Experiments Facility (TA-18): On Thursday, LANL began the Planet control system modifications described last week to improve system reliability. This was screened as a negative Unreviewed Safety Question (site rep weekly 1/11/02).

Authorization Basis (AB): The DOE formal action on AB changes has sometimes led to confusion in the applicable LANL facilities. DOE needs to conduct technically thorough reviews; however, the occasional practice of identifying extensive technical issues and then approving AB changes and assigning new controls as equivalent to Technical Safety Requirements may be contributing to diffusion of the ABs, particularly if LANL does not then update the AB documentation. Several improvements may be warranted. One with immediate benefit would be for the responsible DOE organization to obtain DOE facility representative input before taking formal action.

Public Interaction: On Wednesday, the site rep briefed the Citizens Advisory Board on the role of the DNFSB and discussed the progress made to date and that still required in nuclear material stabilization under Board Recommendations 94-1 and 2000-1 (site rep weekly 10/12/01).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 5, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 5, 2002

The site rep attended a Standing Management Team meeting at Pantex this week to determine the status of laboratory support for Pantex Operations.

Chlorine Dioxide Event: As of Thursday (4/4/02), LANL has not yet issued the investigation report on the January chlorine dioxide explosion in TA-54 West (site rep weeklies 1/11/02, 3/1/02). The site rep believes that the conclusions may have implications on Safe Work Practices for both nuclear and non-nuclear facilities. Timely corrective actions would then be appropriate since Safe Work Practices are one of LANL's main mechanisms for implementing Integrated Safety Management.

Self-Assessment Process: During the Type A investigation of the March 2000 Pu-238 uptake event, DOE identified a need for a comprehensive review of the LANL self-assessment program. Recently, DOE completed such a review with LANL assistance. DOE concluded that LANL is making progress, but improvements are still needed, particularly in the following areas: senior management awareness of assessment results; management accountability for developing and completing corrective actions; integration of existing assessment systems, including external reviews; and sharing of assessment results. DOE observed that the program now partially meets applicable DOE policy and order requirements. LANL is currently reorganizing the Operations organization and increasing focus on performance assessment. This could provide a path forward for implementing these improvements.

Critical Experiments Facility (TA-18): LANL is installing a missing interlock on Flattop that is described in the current authorization basis but apparently was never installed (site rep weekly 2/15/02). In January, LANL proposed to DOE adding an administrative control instead of installing the interlock, because of questions on the as-built configuration and because of other administrative controls in place that should protect personnel (i.e., CASA evacuation before and during Flattop operation). In mid-March, DOE withheld approval of the proposed administrative control. DOE and LANL have since determined that the interlock could be installed using existing hardware and relays.

Authorization Basis (AB): This week, LANL submitted to DOE, on schedule, the proposed updated AB for the Plutonium Facility (TA-55). DOE action is forthcoming on the proposed ABs for TA-18 and the Weapons Engineering Tritium Facility, submitted in March and January, respectively.

High Pressure Tritium Facility (HPTF): DOE concurred last week with LANL downgrading HPTF in TA-33 from a Hazard Category 2 nuclear facility and removing it from the nuclear facility list, since it has a tritium inventory well below the 1.6 gm upper limit for a radiological facility.

HPTF began operation in 1955 and was used for filling high pressure experimental vessels and for transferring low pressure gas. In 1990, operations were halted because the facility did not meet current DOE requirements, including safety requirements. Recently, LANL has engaged in an extensive effort to deinventory and to offgas remaining systems and components via a hood and a monitored stack. The current tritium inventory is estimated to be about one-third gm, and monitored release rates are about 1 Curie (10^{-4} gm) per day.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 12, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 12, 2002

Coones and Jordan were on site this week observing activities related to Recommendation 2000-2.

Recommendation 2000-2: The 2nd and 3rd DOE-LANL Phase II assessments began this week, focused on the Radiochemistry Laboratory (TA-48) fire suppression and the Plutonium Facility (TA-55) fire alarm systems (this is a correction to the 3/29/02 report). These are really being conducted as one review, will last two weeks, and will include some site-wide program elements (e.g., wildfire). The site-wide maintenance assessment started on April 1st. The site-wide fire alarm system review is scheduled to begin in mid-June. The TA-48 confinement ventilation review was suppose to be conducted this month, but appears to be on hold.

The staff believes that the reviews this week got off to a slow start. These two assessments rely heavily on the generic criteria and review approaches (CRAD) document generated last year for Phase II assessments and appear to lack assessment-specific plans, contributing to the slow start. All three assessments that are underway may also have been affected by last-minute changes in team leadership. Currently, the two remaining Phase II assessments have no assigned team leads, a problem DOE is working to correct. Early results from the fire protection reviews indicate a need for configuration management improvements in TA-48 and for a consistent tracking system for fire-protection related deficiencies in both facilities. The staff also believes that LANL requirements need to be more specific for flame-resistant protective clothing for welders.

DOE Independent Oversight Review: The DOE Office of Independent Oversight and Performance Assurance (DOE-OA) returned to LANL this week to validate their report (site rep weekly 3/29/02). DOE-OA described LANL as vastly improved in Integrated Safety Management (ISM), compared to what was seen several years ago in the last similar review; however, opportunities for improvement exist. The DOE Site Office and LANL are preparing a corrective action plan to address findings.

Authorization Basis (AB): This week, DOE issued the Safety Evaluation Report (SER) for the Weapons Engineering Tritium Facility (WETF) upgraded AB, submitted in January. The staff intends to review the SER next week. The next step for LANL is to develop a Technical Safety Requirement (TSR) implementation plan and submit it to DOE for approval. Based on the DOE SER comments, it appears that LANL perhaps could have more thoroughly validated the proposed TSRs from an operations standpoint (e.g., operations walk-down of draft procedures in the facility with the proposed TSRs). If so, further refinement in the TSRs may be needed.

Also this week, DOE approved a Basis for Interim Operation (BIO) to permit moving and storing an irradiated target assembly in the Los Alamos Neutron Science Center (LANSCE). It will be stored at an inactive target station, considered to be Hazard Category 3 (HC-3). Total inventory is about one-fifth the HC-3 limit, and is mostly due to other sources already present (i.e., irradiated depleted uranium shielding). The target assembly is robust and consists of the inconel-jacketed tungsten target surrounded by beryllium and lead reflectors. It weighs nearly 8 tons and will be shielded by a lead and steel cask. It will be stored as a backup for the new target assembly to be installed.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 19, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 19, 2002

McConnell and Nichols were on site this week reviewing tritium facility operations.

Weapons Engineering Tritium Facility (WETF): DOE approved the new WETF authorization basis last week, subject to 16 conditions of approval. This is based on DOE review of the 151 hazard scenarios, 14 evaluation basis accidents, 11 proposed safety-related systems, 8 proposed limiting conditions of operation, and 9 programmatic controls. The dominant accidents are fires involving the entire inventory. The inventory is assumed to be mostly in tritium storage containers and, to a lesser extent, in systems within gloveboxes. The nearest site boundary is 425 meters away.

The WETF safety strategy is highly dependent on the tritium storage containers, considered to be Safety Class; however, not all the containers currently in use are as robust as assumed in the safety analysis. Therefore, DOE has imposed more restrictive inventory limits than LANL proposed, as well as a schedule by when most of the inventory will be in robust containers. Besides containerization, DOE is requiring LANL to perform an aircraft crash analysis and to investigate and address deficiencies in National Electrical Code compliance, fire protection, and on-site transportation.

Authorization Basis (AB): In response to site rep weekly 3/29/02, the DOE Site Office has identified several needs and is pursuing improvements in the AB review, approval, and verification processes.

Regarding WETF, the AB as proposed by LANL and approved by DOE appears to meet the intent of the DOE Nuclear Safety Management Rule (10 CFR 830), but not excessively. Also, when approving the WETF AB, DOE observed that there are still apparent quality issues in the LANL AB preparation and internal review processes. These need to be addressed quickly and thoroughly, given the expected pace this year of major AB submittals for nuclear facilities (about one per month).

Recommendation 2000-2: The DOE team has completed the field work for the two Phase II fire protection assessments discussed last week and expects to issue their findings within a few weeks. In a related area, an interagency wildfire management team held a public meeting this week in Los Alamos. Fuel moisture levels have been trending close to the 10 year low and are lower now than they were in April 2000, one month before the Cerro Grande fire. As a result, LANL has imposed appropriate outdoor restrictions. Longer term, LANL plans to thin about 10,000 acres before the end of FY 03.

Chemistry and Metallurgy Research Facility (CMR): DOE and LANL have nearly completed the multiple-year CMR Upgrades Project and are closing out the project. Extensive improvements have been made to the Operations Center facility monitoring system; emergency lighting and notification; HEPA filtration; duct and hood washdown systems; stack monitors; differential pressure monitors; hot cell controls; and fire alarm and suppression. Transient combustibles were also reduced. Perchlorate-contaminated HEPA filters were replaced. Work remains on the emergency personnel accountability system and internal power distribution. Estimated cost at completion is about 13 % below the \$106M project baseline (total estimated cost in late 1999). For their efforts, the project received the 2001 Deputy Secretary's Excellence Award.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 26, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 26, 2002

Plutonium Facility (TA-55): The Fire Protection Yard Main Replacement Project has been progressing relatively smoothly; however, the entire fire suppression system (old and new) was inadvertently pressurized this week while personnel were preparing to hydrotest a newly installed section. The facility is investigating the event.

Chemistry and Metallurgical Research Building (CMR): CMR is investigating a double failure that likely led to a small amount of contamination outside controlled spaces. On Wednesday, one Wing 7 room had a continuous airborne monitor (CAM) alarm, indicating contamination in a controlled space. The room was secured. Early Thursday morning, a programmable logic controller (PLC) failed, resulting in Wing 7 supply and exhaust ventilation shutting down (a safety-related system). Ventilation was restored, but subsequent surveys discovered contamination outside the door to the room that had the CAM alarm. The facility is preparing a recovery plan.

CMR also reported this week that four plutonium oxide sample vials fell to the floor as they were being removed from a hood. The oxide was double-contained, within inner and outer glass vials. The vials were in a plastic container. The plastic container's lid came loose as it was being lifted. The outer glass vials broke for two of the samples, leaving the inner glass vials as the single barrier protecting personnel in the room. CMR is treating this as a near-miss for personnel uptake and is taking appropriate actions.

Weapons Engineering Tritium Facility (WETF): This week, DOE advised LANL that higher temperature-rated seals need to be used on tritium storage containers (i.e., rated at 482 °F). As reported last week, robust containers are one of the more important engineered features in WETF. DOE indicated willingness to consider alternatives if proposed by LANL.

Authorization Basis (AB): Overall, DOE and LANL have a thorough AB preparation, review, and approval process, but there are some weaknesses that could affect safe and efficient operations. Readiness assessments (RAs) are done before starting up new operations or implementing AB changes. Several people involved here with the AB preparation and review process believe that missteps made during the AB preparation phase should be recognized and could be corrected during the RA phase. The site rep believes that RAs are unlikely to provide that assurance. While an RA team may judge whether an approved safety control is adequately implemented, it is unlikely to question the approved basis for that control. Also, when AB deficiencies are recognized at the RA phase, most facilities find the necessary corrective actions highly disruptive. Those actions may require time-consuming engineered backfits, procedure changes, and operator retraining. Such backfit activities rarely result in solutions as acceptable as those that are developed in advance.

In another area, the site rep has observed that the periodic AB update process is not being rigorously managed because of the high priority assigned on achieving full AB upgrades by April 2003. While the priorities are appropriate, lack of rigor in maintaining updates appears to have caused operational problems in the past. Such problems may occur this next year until the full upgrades are in place.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 3, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 3, 2002

Laboratory Support for Pantex Operations: The site rep attended a Standing Management Team meeting at Pantex this week. The W-88 Step 2 project is expected to establish its baseline early next month (i.e., cost, schedule, scope); however, at this critical juncture, it appears to be coping with loss of key project personnel (Pantex, DOE), as well as reduced LANL support in recent weeks.

Recommendations 94-1/2000-1: The site rep understands that DOE and LANL are considering a flat out-year budget that does not support the draft stabilization schedule discussed with the staff in March (i.e., ramping up, processing most of the material between 2004 and 2008, and completing processing in 2009). Such a budget would likely extend the schedule for stabilizing legacy materials into the next decade. Without stabilization and packaging or disposition, the risks associated with these materials can only be expected to increase with time.

Applying full resources to LANL 94-1 activities would reduce longer-term costs and permit more efficient material storage, freeing up vault space (site rep weekly 3/8/02). The latter improves not only safety but also LANL's ability to support high-priority national security missions. The resources required at LANL to achieve timely stabilization appear to be an order of magnitude less than required for 94-1 activities at some other DOE sites (e.g., Savannah River Site, Hanford). DOE and LANL would likely benefit in multiple ways if 94-1 objectives were vigorously pursued.

Recommendation 2000-2: DOE and LANL have three Phase 2 assessments that are either underway or with completed field work: two fire protection assessments and an institutional maintenance assessment. Collectively, these Phase 2 review teams have or will assess the Plutonium Facility (TA-55), Radiochemistry Laboratory (TA-48), Chemistry and Metallurgical Research (CMR) Building, and Critical Experiments Facility (TA-18). Except for TA-18, facility walk-downs are complete.

No reports are issued yet; however, these assessments have identified issues with inspection, testing, and maintenance of fire protection systems at both the facility and institutional level, particularly with the frequencies and data records for these activities. Complicating matters is that, between 1998 and 2000, LANL proposed and DOE approved equivalencies to the applicable codes (NFPA-25, NFPA-72) that reduced many inspection, test, and maintenance frequencies. Some of the issues now being raised may impact previous assumptions that formed the bases for reducing the frequencies.

Based on preliminary oral feedback from these assessments, LANL began last week facility-specific evaluation of the issues. This is proactive. Also, the DOE Site Office this week directed LANL to take corrective actions such as developing an NFPA-25 assessment program for nuclear facilities, reporting periodically the mean-time-to-repair for fire protection system impairments, and expediting development of a plan to implement a comprehensive maintenance history program.

NMED Cleanup Order: On Wednesday, the New Mexico Environmental Department (NMED) issued a draft order to DOE and LANL, containing environmental investigation, cleanup, and reporting requirements, and a compliance schedule (CY02 - CY11). NMED expects to issue the final order following a 60-day public comment period.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 10, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 10, 2002

Jordan, Martin, Quirk, and Roarty were on site this week reviewing the critical experiments facility (TA-18) proposed authorization basis, machine modifications, SNM inventory, and operations.

Chlorine Dioxide Event: LANL progress on addressing the January chlorine dioxide explosion in TA-54 West and implementing corrective actions appears to be lagging. The investigation report is not yet issued. When issued, it may have implications on laboratory work control, Safe Work Practices, and Integrated Safety Management (site rep weeklies 1/11/02, 3/1/02, 4/5/02).

Authorization Basis (AB): Due to escalating resource estimates, DOE and LANL are considering broader use of Bases of Interim Operation (BIOs) to bring nuclear facility ABs into compliance with the Nuclear Safety Management rule (10 CFR 830) by April 2003. DOE already planned to use BIOs for the Chemistry and Metallurgical Research building (CMR) and the critical experiments facility (TA-18). New candidates for BIOs include the radiochemistry laboratory (TA-48), the waste characterization and reduction facility, and possibly others.

Critical Experiments Facility (TA-18): The staff is reviewing TA-18 operations, inventory, and proposed AB changes. Overall, TA-18 is making progress on addressing issues reported earlier this year. Godiva and Comet are working well. Planet has been shutdown since November 2001. Control system upgrades are in place and will be tested next week. Flattop has been inoperable since February 2000. Its upgraded control rod drive system and missing interlock are installed. LANL anticipates restart in June. SHEBA has been inoperable since August 2000 due to the flammable gas generation question. LANL has submitted an Unreviewed Safety Question Determination to DOE and anticipates restart in July. The gas generation issue may require modifications to resolve (e.g., instrumentation to confirm head-space flow and inerting).

The upgraded AB proposed by LANL in March is still under review by DOE. Overall, it appears to be an improvement but will require further clarification and supporting equipment upgrades. Regarding the special nuclear material (SNM) inventory, TA-18 appears to have made a good start at identifying materials no longer required and has proposed to DOE an active material management program as an AB administrative control. Some excess uranium material has already been shipped. Progress is being made toward near-term disposition of excess SHEBA uranium solutions, now stored in potentially embrittled plastic containers. In about two months, LANL expects disposition plans for roughly 30 drums of poorly characterized uranium-based material. CMR receipt capability and throughput appears to be the rate-controlling step for disposition of some excess uranium in TA-18.

Decontamination and Volume Reduction System (DVRS): DVRS will require manually intensive radiological operations and will process packages of increasing hazard with time (site rep weekly 3/1/02). DOE and LANL plan to start up DVRS in phases: first as a low-hazard, radiological facility, upgrading later to a Hazard Category 3 and possibly even Hazard Category 2 nuclear facility. The site rep understands that LANL has resubmitted the hazard analysis to DOE and plans to begin its readiness assessment (RA) next week. A DOE RA is scheduled for the end of June.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 17, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
J. J. McConnell, Deputy Technical Director
FROM: C. Keilers
SUBJECT: Los Alamos Report for Week Ending May 17, 2002

Site representative C. Keilers was in Washington, D.C., Monday through Thursday. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 24, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 24, 2002

The site rep office was closed this week. This report is provided for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 31, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 31, 2002

Gwal, Jordan, Martin, White, and Collier (OE) were on site last week reviewing lightning protection.

Lightning Protection: The Board staff team last week observed that LANL is making progress overall in complying with NFPA 780 requirements on facility lightning protection. However, several issues remain open. For example, the frequency of facility inspections does not always comply with either NFPA 780 requirements or the LANL Operations and Maintenance Manual. Deficiencies found in inspections do not always appear to be repaired on a timely basis. Impacts to the lightning protection systems are not always considered when changes are made to the roof structures or appurtenances. In the new authorization basis for the Weapons Engineering Tritium Facility (WETF), DOE and LANL rated the lightning protection system as safety class but that system has not been adequately inspected or maintained. Also, the new WETF Technical Safety Requirements (TSRs) list the NFPA 780 lightning protection system as a design feature requiring annual in-service inspection. Given this system is safety class, a surveillance requirement, possibly to more stringent standards than used in other facilities, may be warranted. The staff is pursuing these issues with DOE and LANL.

Dual Axis Radiographic Hydrodynamic Test Facility (DARHT): DOE and LANL have categorized DARHT as a moderate hazard non-nuclear facility that may occasionally be required to perform a nuclear activity (reference: DAHRT Final EIS, 8/95). The staff has been reviewing the additional hazards posed during such activities and the development of controls. During last week's review, the staff observed that little progress has been made toward engineered lightning protection controls that would address a future hazard at the DARHT firing point even though this hazard had been identified long ago. Other plans for this activity appear well considered. DARHT is now evaluating replacing gravel at the firing point with a concrete pad as part of beryllium remediation. It may be cost-effective and efficient to include lightning protection controls in the design of the new concrete pad. This appears to be a worthwhile opportunity to enhance safety. This condition could have been recognized sooner if DOE and LANL made more effective use of preliminary function classification to iterate early-on between safety analyses and design, as discussed in site rep weekly 2/8/02.

Decontamination and Volume Reduction System (DVRS): The management self-assessment and LANL readiness assessment (RA) are complete. The DOE RA is scheduled to begin June 24th. The site rep understands that the LANL RA had 5 pre-starts, 8 post-starts, and 37 observations. While there are several positive observations, it appears from the findings that the LANL RA may have been more of a "management-assist" than typical and that several of the post-starts and observations may involve worker safety issues and formality of preparation, process, and operations that warrant action before startup. DOE and LANL are pursuing resolution of these issues.

Recommendation 2000-2: More attention appears to be needed on jump-starting the delayed Phase II assessment of the Radiochemistry Laboratory (TA-48, RC-1) ventilation system. This assessment was put on hold in early April due to lack of assigned team leadership (site rep weekly 4/12/02). The reports for the two fire protection reviews are near completion. The institutional maintenance review is continuing, and in the site rep's opinion, is progressing slowly but satisfactorily.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 7, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 7, 2002

The site rep was in training this week, Monday through Wednesday, and attended the Standing Management Team meeting at Pantex, Thursday and Friday.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 14, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 14, 2002

Chlorine Dioxide Event: The site rep understands that LANL issued the investigation report this week, five months after the event (site rep weeklies 1/11/02, 5/10/02).

Recommendation 2000-2: DOE/LANL Phase II assessments have identified weaknesses in the LANL program for inspection, testing, and maintenance for fire protection systems (site rep weekly 5/3/02). While present conditions do not constitute an imminent hazard, DOE and LANL have begun to move quickly to understand and correct these weaknesses in advance of issuance of the final assessment reports. In particular, LANL has begun a review of inspection, testing, and maintenance procedures for fire detection, alarm, and suppression systems, and on May 30th, issued a path forward to further investigate and correct deficiencies during the next few months. Overall, the site rep has been impressed with the speed and frankness in addressing these emergent issues.

Annual Emergency Exercise: The annual emergency response exercise occurred last Wednesday, focused on the Weapons Engineering Tritium Facility (WETF). The scenario simulated a fire, tritium release, and several highly exposed, injured personnel. The site rep understands that overall the exercise went well and that opportunities for improvements were identified, including: communications, simulation, incident command post timeliness, and resource allocation and commitment to the exercise (e.g., police, fire department, radiation protection personnel).

Critical Experiments Facility (TA-18): On May 28th, LANL management authorized restart of the Planet critical assembly. Planet has been shutdown longer than 5 months for control system upgrades (site rep weeklies 1/11/02, 5/10/02). LANL conducted a management self-assessment and a readiness assessment (RA) before startup authorization. Pre-start conditions addressed include updating and verifying as-built control system drawings and completing TSR surveillance requirements for calibration of SCRAM settings and nuclear instrumentation. Post-start conditions to be addressed include updating the Planet system design description and crew qualification training material. Based on the Planet upgrade experience, LANL identified needs to improve documentation of changes during the design and development stages for new projects, as well as the qualification records for personnel performing design, quality, and verification functions.

Waste Management: As part of Cerro Grande fire rehabilitation, DOE and LANL are pursuing several risk reduction activities in the waste management areas. For example, TA-54 has a large, distributed transuranic (TRU) waste inventory, intended for WIPP. DOE and LANL have estimated that about 2,000 drums of high wattage waste constitute about 60% of the accessible (i.e., above-ground) and potentially dispersible source-term. DOE is pursuing an approach to accelerate shipment of the high wattage drums; considering a plan to accelerate shipment of the remaining TRU waste inventories; and evaluating a proposal to build a fire-rated industrial building for TRU waste storage – the High Activity Waste Storage Facility. In the radioactive liquid waste area (TA-50 - hazard category 3), the Cerro Grande rehabilitation efforts include a membrane process unit, pump house, influent storage (an additional 300,000 gallons), and ventilation upgrades. DOE and LANL have made recent improvements in program liaison, coordination, and strategic planning of these activities, which should increase the chances of success.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 21, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 21, 2002

Nichols was on site last week reviewing the Unreviewed Safety Question (USQ) process.

Lightning Protection: The lightning protection issues previously discussed continue to warrant attention (site rep weekly 5/31/02). On the positive side, DOE has pursued with LANL having a utility pole grounding cable survey conducted at LANL nuclear facilities. The site rep understands that 25% had unsatisfactory high resistance (4 of 16 poles). This may warrant corrective action.

Authorization Basis (AB): Overall, DOE and LANL have a thorough AB preparation and review process, but there is room for improvement. Last week, the staff reviewed a small sampling of USQ documentation, and observed the LANL USQ training course, and found these to be excellent. In other areas, the Board staff has observed that improvements may be needed, particularly in functional classification, mapping from functional classification to controls (i.e., either engineered features or technical safety requirements), and then implementing appropriate controls. The site rep continues to pursue these areas in need of improvement.

Plutonium Facility (TA-55): The Fire Protection Yard Main Replacement Project is intended to replace the leaking fire water loop and improve system reliability. The project is running several weeks behind due to emergent problems, as well as AB constraints that prohibit performing too many complex activities in parallel (site rep weekly 10/19/01). Also, a polyethylene pipe section unexpectedly fractured while it was being sawed this week. LANL and the piping manufacturer are investigating. Meanwhile, the existing loop continues to occasionally leak. Last week, an approximately 1000 gal/day leak to an admin building occurred and was repaired. Overall, LANL appears to be well-managing the risks associated with the current system by maintaining fire water availability. Completing this project on a timely basis continues to warrant management attention.

Critical Experiments Facility (TA-18): This week, LANL authorized startup of Flattop following a successful readiness assessment. SHEBA (the fissile solution machine) is now the only one of the five critical assemblies that is not operational. Flattop has been inoperational since February 2000 due to problems with the control rod drive system. A sticking control rod issue has been resolved by mounting the drive system to the underside of the table. Previously, it sat on the floor. Also, a missing interlock has been installed and tested successfully. It prevents SCRAM reset until all control rods are fully retracted. LANL had proposed using an administrative control instead of installing the interlock (site rep weekly 2/15/02), but pursued the engineered control based on DOE feedback. The site rep understands that it took four attempts before the interlock was successfully installed: twice due to inadequacies in configuration management (i.e., as-built records) and the third time due to improper restoration of removed connections. With DOE encouragement, TA-18 has learned from this experience and improved configuration management, as well as hired system engineers, and improved document control. TA-18 continues to pursue configuration control improvements.

Decontamination and Volume Reduction System (DVRS): The DOE readiness assessment was to start next week but has slipped to the week of July 15th (site rep weekly 5/31/02).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 28, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 28, 2002

The site rep was at Pantex this week to assess the status of laboratory support for Pantex operations.

Chlorine Dioxide Event: On June 14th, LANL issued their investigation report on the January liquid chlorine dioxide explosion in a non-nuclear facility (site rep weekly 1/11/02). The report indicates that, based on informal hazard analysis and peer review, personnel modified the experiment to produce a higher concentration product, including increasing the chlorine feed concentration to 100%. The revised experiment exceeded conditions assumed in the Hazard Control Plan (e.g., 4% chlorine feed limit). While personnel were sensitive to some increased hazards (particularly, exothermic gas generation), they missed the fact that the changes made could lead to condensation in a vessel downstream of the gas generators. The liquid phase is energetic and unstable.

The LANL investigation determined that the root cause was performance of the experiment without adequately following the LANL Safe Work Practices, which is the LANL mechanism for implementing Integrated Safety Management (ISM) into programmatic work. The report concludes with seven judgements of need. Some are specific to the affected LANL division while others involve institutional changes (e.g., changes to the Laboratory Implementing Requirements - LIRs). The latter includes improving peer review requirements, clarifying pressure safety and packaging & transportation requirements, and consolidating hazard analyses into one process so that consistent identification and communication of hazards occurs among all personnel involved in the work. LANL stated that corrective actions, both planned and completed, will be submitted to DOE by the appropriate organizations. The Board's staff is reviewing the LANL report, since it will likely have implications on both nuclear and non-nuclear programmatic work at LANL.

Recommendation 2000-2: In the process of conducting the Phase II maintenance review, TA-18 (Critical Experiments Facility) has determined that the fire alarm and detection functional tests may not have been performed since September 1999, based on lack of records. The tests are required annually by the Safety Analysis Report. TA-18 has terminated experimental operations, stationed fire-watches, and is scheduling to test all the TA-18 detectors this week. Operations will resume once testing in each building is complete. LANL believes that the annual tests were inadvertently omitted in 1999 when preventive maintenance scheduling was transferred from one database to another (i.e., from the Facility Maintenance System to Passport).

TA-18 Flood Retention Structure (FRS): Progress has been made in addressing questions raised in a Board letter (11/5/01) on the FRS, but several actions remain incomplete. The site rep understands that DOE has contracted with the Army Corp of Engineers to inspect the structure, currently scheduled for the week of July 22nd. Core drilling of the roller compacted concrete is done. Results are forthcoming. Additional drilling is underway upstream and downstream to determine if a sand and gravel layer exists beneath the foundation. Slopes have been seeded for erosion control. The outlet side is being excavated to install rock gabions. This work was impacted by heavy rain the evening of June 21st. Similar erosion control improvements are planned on the inlet side.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 5, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 5, 2002

The site rep was in training Monday and Tuesday of this week.

Plutonium Facility (TA-55): The following are noteworthy:

- C On Monday (7/1/02), DOE signed out its response to the Board's letter on the new Pu-238 Scrap Recovery Line (4/23/02). To the site rep's knowledge, DOE and LANL have pursued few, if any, safety improvements in response to the Board's letter – such as, full consideration for engineered controls over administrative controls, even for those administrative controls that DOE approved as Safety Class. Also, the DOE and LANL plan is to incorporate those administrative controls into the Technical Safety Requirements during the next normal revision, not prior to startup of the new line (i.e., September 2002).
- C The LANL readiness assessment (RA) for the new Pu-238 Scrap Recovery Line starts next week. The DOE RA is expected in early to mid August. DOE and LANL appear to be placing a high reliance on the RA teams identifying any safety issues, not only in operations, but also in the design and the authorization basis areas.
- C Last Thursday, personnel inadvertently dropped a double-contained can of plutonium oxide during a bag-out operation. While the can remained intact, the dispersed contamination from the can's surface was sufficient to set off continuous airborne monitors (CAMs) in several rooms, leading 15 people to evacuate these rooms to the corridor. Two individuals had low-level positive nasal smears (i.e., anticipate minimal health consequences). The site rep understands that personnel involved did not confirm the integrity of the bag-out bag prior to the operation, as required by procedure.
- C Last Friday, PF-4 (plutonium operations) had a partial loss of ventilation when five fan motors tripped during maintenance on the control system. Zone 1 ventilation (i.e., for gloveboxes) continued operating. LANL is investigating to determine the cause.
- C Site rep weekly 6/21/02 reported polyethylene piping for the Fire Protection Yard Main Replacement Project that unexpectedly fractured while it was being cut. The site rep now understands that the piping has normally been cut with a chain saw but was cut in this case with a regular saw (i.e., sharper notch). The piping vendor has reviewed the fractured piping, observed that the polyethylene piping can fail in a non-ductile manner in certain instances of high localized stress, and believes that the fracture surface appearance does not indicate an anomaly. As an independent check, LANL has also had a Savannah River Site (SRS) piping expert review the vendor's report. That expert observed that the reported strength properties are within specification and that the fracture shear area was comparable to the cleavage area, indicating ductile behavior. DOE and LANL are pursuing closure of this question.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 12, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 12, 2002

The site rep was at Pantex part of this week, discussing laboratory support for Pantex operations.

Authorization Basis (AB): Both DOE and LANL need to improve integration between operations and AB activities, as well as tracking AB issues to closure. This is a recurring issue. Recent examples are as follows:

- C LANL conducted a special operation in the hazard category 2 Radiography Facility (TA-8-23) after DOE approved related AB changes but before DOE validated that the AB controls were in place. DOE validation is a standing requirement, typically reiterated in DOE AB approval memos to LANL.
- C LANL was two days late submitting a Weapons Engineering Tritium Facility (WETF) transportation plan required by the DOE Safety Evaluation Report (SER). The plan involves installing vehicle barriers and speed limit signs, and referencing the applicable Laboratory Implementing Requirement (LIR). It appears that DOE considers this a violation of SER conditions of approval equivalent to Technical Safety Requirements (TSRs).
- C DOE approval of the TA-18 material relocation project AB was contingent on DOE also approving related seismic analyses. LANL has completed the analyses, but to the site rep's knowledge, DOE has not yet taken action on these analyses (site rep weekly 3/8/02).

Plutonium Facility (TA-55): The LANL Readiness Assessment (RA) for the Pu-238 Scrap Recovery Line started Wednesday and continues into next week. DOE and LANL expect their RA teams to identify safety issues beyond those associated with operations. The site rep now understands that further procedure changes are anticipated as a result of the step-by-step walk-downs by the LANL RA team. This raises questions on the extent of pre-RA procedure validation.

This week, the site rep reviewed some of the current procedures. It is challenging to determine if all the AB controls are incorporated and to assure that they will be retained in future revisions. The controls are not yet captured in Technical Safety Requirements (TSRs). Some procedure steps implementing AB requirements are indicated as such, but not all. There is no apparent mapping (e.g., a linking database) between each AB requirement and the implementing procedure step(s).

Several AB controls are embedded in the Master Equipment List (MEL) maintenance schedule. This includes the Safety Class controls that resin is covered with solution, checked weekly, and that the resin is within its 5-year operational life, checked semiannually. The site rep has found no dose limits imposed on the resin. Under some conditions, it appears that a Pu238-loaded resin column without flow might dry out in less than a week. DOE and LANL are relying on the auto-elution system to prevent dry-out but consider it to be defense in depth. The MEL also requires the facility to report a non-conformance if the schedules cannot be met. The site rep believes that a non-conformance report may not generate the visibility and response that potentially violating a Safety Class control should warrant.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 19, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 19, 2002

The Board and a staff team were on site this week, reviewing the application of safety management standards to high priority defense nuclear projects.

Plutonium Facility (TA-55): The laboratory readiness assessment (RA) was completed this week for the new Pu-238 Scrap Recovery Line. The site rep understands that the RA team identified improvements that are needed in procedures and in quality assurance. The DOE RA is expected to occur in mid-August. Startup is scheduled for September.

LANL has evaluated the recent loss of PF-4 room and corridor ventilation (site rep weekly 7/5/02). The loss occurred when five fan motors tripped during the replacement of a ventilation control system backup power supply. LANL has determined the replacement power supply was defective.

DOE and LANL are exploring the possibility of conducting radiography operations in PF-41. This building was previously designated but never used as the Nuclear Materials Storage Facility (NMSF). It appears that PF-41 may be pursued as a replacement for the current Radiography Facility (TA-8-23) – a Hazard Category 2 facility, located in a 1940s era building, and used for nondestructive testing of high explosive (HE) and nuclear components. Logistically, there are advantages to using PF-41 to radiograph components made in PF-4. At this time, it is unclear whether the scope also includes HE components. The latter would introduce a new, unevaluated hazard inside the fence of TA-55. DOE is discussing the possibilities with the site rep.

Decontamination and Volume Reduction System (DVRS): The DOE RA was completed this week, and the RA report is expected next Friday (site rep weekly 6/21/02). The RA scope covers startup as a radiological facility. After a period of operation, DOE and LANL expect to complete further readiness assessment activities (possibly ORRs) and transition DVRS to Hazard Category 3 and potentially Hazard Category 2. One DOE finding involves clearly demonstrating that the hazard control plans implement the safe work practice requirements (i.e., Integrated Safety Management). Other tentative DOE RA pre-start findings include improving:

- C configuration management (e.g., putting set points in the Facility Design Description)
- C operations formality (e.g., daily pre-op checks on alarms)
- C emergency management (e.g., update pre-fire plans, as well as site maps to show DVRS)
- C fire protection (e.g., install seismic bracing shown on drawings, NFPA 25/72 inspections)
- C worker safety (e.g., consider heat stress factors, Be hazard characterization)

The site rep believes that DVRS startup is important since it addresses risks associated with radioactive waste forms stored in several hundred fiber-glass reinforced plywood boxes. It is equally important to identify the safety systems likely to be needed to support future operations, and then implement appropriate configuration management. To the site rep's knowledge, this has not been done, and DOE and LANL will likely default to administrative controls. DVRS might benefit from preliminary functional classification, similar to other activities discussed (site rep weekly 5/31/02).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 26, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 26, 2002

Plutonium Facility (TA-55): The DOE readiness assessment (RA) for the new Pu-238 scrap recovery line is tentatively scheduled to begin August 19th.

Decommissioning Activities: A LANL subcontractor is preparing to open and non-destructively characterize a pair of buried, 50,000 gal tanks in TA-21 containing radioactive sludge. Estimated transuranic inventory is 200-400 gm (12-25 Ci). This exceeds the threshold for Hazard Category 3 (HC-3) and is a quarter to half the HC-2 threshold.

The tanks were used between 1945 and the mid-1970s as liquid radioactive waste receiver tanks, and they have been inactive for two decades. Standing liquid wastes were pumped out when TA-21 plutonium operations ceased. The plan has been to excavate to each tank's opening, lift the cover with a backhoe, allow the tank to naturally ventilate, monitor the tank head-space for combustibles and airborne radioactivity, and then complete characterization activities.

Questions arose this week on the hazards, the adequacy of controls, and the assessment of readiness to conduct this operation. In particular, it appears that the possibility that the tanks are sealed, allowing flammable gases to accumulate, can not be ruled out at this time. It also appears that better contamination control during excavation and filtered ventilation to prevent an airborne release would be appropriate. The site rep understands these questions are being pursued.

Chemistry and Metallurgical Research Building (CMR): CMR is celebrating its 50th anniversary this week. It continues to play a key role in actinide research, analytical chemistry, and material characterization. CMR is also likely key to disposition of the excess uranium solutions now at TA-18 (SHEBA fuel) and the 9 large spherical vessels containing SNM at TA-55. The latter is discussed in the new 94-1 Implementation Plan submitted by DOE this week.

Last week, the Secretary of Energy approved the mission need (CD-0) for the CMR Replacement Project. Conceptual design, preliminary hazard analysis, and NEPA activities are scheduled to begin shortly. Holmes and Narver is leading the architect-engineer services team during this phase. Estimated completion of conceptual and preliminary design phases are in 8/03 and 9/04, respectively. The scope potentially includes current CMR operations (except hot cells), as well as similar actinide chemistry activities now done in TA-55, new storage vault(s), large vessel activities, and contingency space for future missions. The schedule range for completion is 9-14 years. DOE will establish the project baseline (cost, schedule, and scope) at the end of preliminary design.

Radiography Facility (TA-8-23): TA-8-23 is currently operating under a Justification for Continued Operation (site rep weekly 2/22/02). LANL expects to submit a safety basis in September. TA-8-23 is more than 50 years old, and lacks seismic, confinement, and engineered fire suppression features. As discussed last week, DOE and LANL are considering shifting radiography operations to TA-55 (PF-41-NMSF). Based on discussion with DOE, it appears likely that radiography of either high explosive or high heat (Pu-238) components will only be permitted in TA-8-23.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 2, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 2, 2002

Decommissioning Activities: DOE has provided comments and LANL management has increased attention on ensuring that the tank characterization activity discussed last week will be safely conducted and that pre-start readiness will be adequately assessed.

Plutonium Facility (TA-55): Last Wednesday night, PF-4 shutdown all ventilation in a controlled manner in order to repair a minor instrument air leak. While ventilation was shutdown, the facility was depending on confinement integrity without differential pressure to prevent a release. This is permitted by the Authorization Basis (AB). Following the repair (about 1 hour), TA-55 restored ventilation, confirmed no release of radioactivity, and returned to normal operation. LANL is planning system upgrades to eliminate this single-point failure mode in the future.

There were options physically available to perform this minor repair without shutting down ventilation. Specifically, either process air or nitrogen could have been valved in through an existing cross-connect and thereby maintained instrument air capacity while the repair was made. These options were not pursued because of a DOE AB requirement to keep process air isolated from instrument air. Nuclear facilities are expected to strictly adhere to these requirements; however, in this case, this may have put the facility into a potentially more vulnerable position. It may have been better if DOE and LANL had evaluated the relative risks of the options available on a timely basis that supported facility operations and then pursued the least risk alternative, revising the AB if necessary and appropriate, possibly even on a temporary basis.

Lightning Monitoring: Last Friday, the Radiography Facility (TA-8-23) discovered that it had operated that day and been unaware of a one-hour lightning warning. The facility's AB requires action during a lightning warning if certain types of operations are being conducted. By chance, none of those operations were underway, and Friday's operation actually was completed in the morning, while the lightning warning occurred in the afternoon. To meet the AB requirement during special operations (and as good practice at other times), TA-8-23 has an informal agreement with another LANL division (DX) to be notified when lightning conditions arise. However, no notification was made last Friday. The facility is now pursuing a formal agreement on notification. There are other possible improvements (e.g., an auto-dial alert system).

Longer-term, LANL intends to delete the notification requirement from the facility's AB. LANL believes that notification provides little additional safety over the "Faraday-cage like" building and the periodic verification of compliance to the applicable standard (NFPA-780). The site rep believes that there may be transient operations (e.g., vehicle loading or unloading) when lightning notification and safely securing operations may be appropriate AB requirements.

Critical Experiments Facility (TA-18): This week, DOE issued the Safety Evaluation Report (SER) for the new TA-18 AB, submitted by LANL in March (site rep weekly 5/10/02).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 9, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 9, 2002

Authorization Basis (AB): DOE and LANL are updating numerous ABs this year; however, plans for verifying their implementation appear highly preliminary and not resource-loaded. Particularly on the DOE side, the site rep believes that increased coordination and rigor are warranted.

Facility Operations and Maintenance: On Thursday, LANL announced that a team led by Kellogg Brown and Root Inc. will replace Johnson Controls Northern New Mexico (JCNNM) as the site services contractor. Others on the team are Shaw Infrastructure Inc. and Los Alamos Technical Associates Inc. Transition begins October 1st. The contract is for 5 years and valued at \$145M/yr.

Plutonium Facility (TA-55): TA-55 violated a Technical Safety Requirement (TSR) on Thursday when the facility took one building exhaust fan out of service for maintenance and did not verify operability of its complementary fan and plenum within one hour. Operability was confirmed within about 4 hours. DOE and LANL are pursuing why this occurred.

DOE and LANL have slipped the final readiness assessment for the new Pu-238 scrap recovery line to allow time to address issues raised in a Board letter (4/23/02). LANL has told the site rep that they are considering engineered solutions in place of administrative controls and that they will declare readiness only after senior management is satisfied with how these issues are addressed.

Radiochemistry Laboratory (TA-48): The current TA-48 authorization basis for perchlorate operations consists of a DOE approval letter (2/01), a Justification for Continued Operation (JCO), and a hazard control plan (HCP). The DOE approval letter included specific requirements, as TSR-level, for 10 minute washdowns of the glove box fume hood and the ventilation ducts after fuming operations. The HCP requires weekly ventilation duct washdowns of "about 10 minutes," regardless of whether fuming operations were done that week or not.

DOE and LANL have been investigating this week to determine whether all of these requirements have been met, particularly whether washdowns of 10 minute duration are being done after fuming operations. LANL documentation to show compliance is poor. At this time, it appears possible that a repeated violation of a TSR-level requirement in the DOE approval letter may have occurred.

Critical Experiments Facility (TA-18): TA-18 is making progress on reducing the excess material inventory (site rep weeklies 3/8/02, 5/10/02). The facility recently shipped several special nuclear material (SNM) items to TA-55 and most of the Omega West reactor fuel inventory to Oakridge. Eight fuel rods remain and are expected to be repackaged and shipped by the end of August.

Next week, LANL will also likely start shipping excess uranium solutions (SHEBA fuel) to the Chemistry and Metallurgical Research Building (CMR), one bottle at a time. At CMR, the solutions will be converted to uranyl salt and then shipped back to TA-18 for storage and potential future use. The solutions are now stored in about two dozen plastic bottles offering limited protection. They will be transferred to new bottles and shipped in 6M containers for safety reasons. TA-18 is also working with CMR to develop a path-forward to address about 30 poorly characterized drums of uranium.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 16, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 16, 2002

The site rep was off site Monday through Thursday.

Plutonium Facility (TA-55): TA-55 began tying in the new fire water main on two sides of PF-4 last weekend and expects to complete these tie-ins today. While substantial progress has been made to date, the fire water main replacement project is experiencing increased cost and delay. Without changes, it is now expected to be completed after the site services contract shifts to a new contractor on October 1st. The site rep understands that a transition plan is being developed. It appears that the remaining work may be accomplished on an extended schedule, possibly with a transition management team, or it may be reduced in scope, resulting in an improved but less capable replacement system than originally intended.

Radiochemistry Laboratory (TA-48): Last week, DOE approved a new TA-48 authorization basis (AB) for a 2 year interim period. It consists of a Basis for Interim Operation (BIO), Technical Safety Requirements (TSRs), and the DOE approval letter. It identifies several safety-significant systems (e.g., gloveboxes, containers, hot cell shielding, fire barriers, flammable gas inerting), several safety-related administrative programs, and one limiting condition for operation, which is to keep the actinide inventory less than about one-fifth the Hazard Category 3 (HC-3) upper limit.

TA-48 is 46 years old. It does not meet current requirements, particularly for fire protection and seismic; therefore, DOE requested cost-benefit analyses for upgrades. TA-48 also uses hazardous materials, such as perchloric acid, natural gas, and propane, that are administratively controlled. During the next 2 years, LANL is pursuing reducing the radiological inventory and downgrading TA-48 from HC-3 to a radiological facility. Options being considered include relocating actinide research operations to a HC-2 facility: either the Chemistry and Metallurgical Research Facility (CMR) or the Radioactive Materials, Research, Operations and Demonstration Facility (TA-50-37).

Readiness Assessments: DOE and LANL are making needed improvements to their process for readiness assessments (RAs) and operational readiness reviews (ORRs). The process now is more expert-based than standards-based. Requirements are captured in the DOE startup/restart order (DOE O425.1B), a DOE-Albuquerque supplementary directive issued in March 2001, and LANL operational notices referencing DOE requirements, issued in August 2000 and January 2002.

Weaknesses in the DOE/LANL process (as well as absence of key individuals) may have contributed to LANL recently performing an evolution in a HC-2 facility before DOE validated that the controls were in place (site rep weekly 7/12/02). Also, some uncertainty exists on when and how DOE and LANL will validate the phased implementation of new TSRs approved as part of the AB upgrade effort. This appears to have delayed ORRs for startup of a new addition to the Weapons Engineering Tritium Facility (WETF). Other nuclear facilities here are expected to have upgraded ABs approved during the next 8 months, and they can all be expected to face similar issues. Better coordination in developing TSR implementation plans might help. LANL has prepared draft institutional procedures on the RA process. DOE and LANL expect to finalize these procedures by September 30th.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 23, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 23, 2002

Authorization Basis (AB): DOE and LANL are increasingly concerned with the pace of Technical Safety Requirement (TSR) violations or near-violations (e.g., site rep weekly 8/9/02 discusses two). This is not a new issue. The site rep previously reported on a thorough LANL TSR performance review that resulted in sound recommendations on how to improve (site rep weekly 9/7/01). If facilities were pursuing these improvements, it is reasonable to expect that the number of violations reported would increase in the near term but the significance of the events should decrease. This does not seem to be the case here; however, reporting TSR violations should not be discouraged. Reporting leads to lessons-learned that can improve the process.

It may be appropriate for DOE and LANL to systematically review the recent events, update the previous LANL study, and pursue with vigor implementing improvements in TSR performance and formality of operations. Some of this is underway. That said, ambiguous communications, diffuse AB requirements, over-reliance on key individuals, inattention, incomplete documentation, and management level of awareness all appear to have played a role in recent events. Some problems are traceable to both DOE and LANL. The current AB upgrade effort provides an opportunity to improve the TSRs by ensuring they not only form a complete set from a safety standpoint, but also are operationally clear, correct, concise, and assembled in one place (i.e., operator-friendly). More and broader attention may be warranted on developing, implementing, and verifying these new controls.

Radiography Facility (TA-8-23): DOE has performed few readiness assessments (RAs) at LANL in the last year. Most recent RAs have been done by LANL and observed by a DOE facility representative. This week, DOE performed a readiness assessment (RA) on the Radiography Facility under its current AB – a Justification for Continued Operation. The RA team reviewed procedures and walked through radiographing a special nuclear material (SNM) item. Tentative findings and observations include the needs for documented certification of high explosive handlers; improved formality of radiological operations and TSR completion; and better preparation and drills, as well as clarified responsibilities, for responding to an SNM drop. Longer term, the facility expects to submit to DOE a new AB in September, which will require separate validation. The site rep expects the pace for this type of DOE and LANL readiness assessment, one focused on AB changes, will increase.

Infrastructure: LANL has a large number of pressure, vacuum, and cryogenic systems that pose a hazard in varying degrees. Many of these systems have little, if any, documentation indicating systematic inspection by a certified inspector. In 1999, LANL issued a Laboratory Implementation Requirement (LIR) capturing current pressure safety criteria. LANL is nearing completion of an effort to catalog these systems per the LIR, and is about to begin a multi-year screening effort. Detailed inspections are expected to be performed concurrent with screening on a risk-prioritized basis.

Decontamination and Volume Reduction System (DVRS): DOE and LANL expect to authorize DVRS startup as a radiological facility soon. Operations could begin next week (site rep weekly 7/19/02). Seismic bracing of fire protection piping has been downgraded from a pre-start finding and remains to be completed. The initial plywood boxes to be processed contain low source-term items.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 30, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 30, 2002

Wildfires: Two major wildfires broke out Monday west of Los Alamos in the Jemez mountains. The fires were slowed by rain on Wednesday and should be fully contained this weekend.

Plutonium Facility (TA-55): The Fire Protection Yard Main Replacement Project is progressing and is receiving increased management attention because of the previously reported cost/schedule issues. DOE and LANL anticipate rebaselining the project next month with no reduction in final system capabilities (site rep weekly 8/16/02).

Critical Experiments Facility (TA-18): Last week, DOE approved the seismic analysis to support the material relocation project that was authorized in March (site rep weeklies 3/8/02, 7/12/02). LANL sized the anchorage based on an equivalent static analysis and peak acceleration assuming 5% damping. DOE has concluded that the storage system is capable of withstanding a Performance Category 3 (PC-3) seismic event, given that the anchorage is installed as designed to prevent tipping. LANL has installed and confirmed the anchorage is as designed. As-built drawings are being prepared. One remaining question is the need for a dynamic analysis to confirm assumptions made in the static analysis. Longer-term, LANL is considering other storage enhancements that, if implemented, might reduce or eliminate the need for this storage system.

Waste Management: Operators manned the Radioactive Liquid Waste (RLW) Treatment Facility (TA-50) during the 2000 Cerro Grande fire to manage storage and prevent an untreated release. As part of the rehabilitation project, DOE and LANL are now considering upgrades to provide remote monitoring and control capabilities, new influent storage tanks, and a new pump station, to be housed in a separate 10,000 ft² addition.

The preliminary safety analysis indicates that this would be a Hazard Category 3 (HC-3) nuclear operation. A number of controls are described, but no safety-significant systems are identified. The actual inventory relies on generator facilities meeting a restrictive waste acceptance criterion. The existing RLW Treatment Facility is now a HC-3 operation, although the potential exists that DOE and LANL will categorize it as HC-2 after the new Authorization Basis is submitted next month. This might impact design requirements for the new addition.

The new addition would consist of a metal building above grade and a concrete vault structure below grade (26 feet), permitting gravity flow. Six horizontal storage tanks (300,000 gal total) and a multi-level pump room would be housed in the below-grade vault. New double-wall piping would tie the addition into the existing facility. Design criteria are based on PC-2 seismic/wind hazards. The design is nearly complete and underwent an external independent review this week. DOE and LANL intend to pursue awarding a design-build contract in November, and to complete the project and authorize operations in FY-03. Overall, this appears to be a well-run project that should improve the facility's safety, as well as the robustness of LANL's RLW complex to upset conditions.

Quality Assurance: Slow progress is being made in improving institutional quality assurance at LANL. The Board's staff is planning a review of this area, as it affects safety, in October.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 6, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 6, 2002

The site rep was at Pantex this week to assess the status of laboratory support for Pantex operations.

Recommendation 2000-2: Last year, DOE and LANL identified five Phase II assessments to be conducted (site rep weekly 12/7/01). Three are complete, and two are remaining. Specifically, DOE has reported results for the Plutonium Facility (TA-55) fire alarm system; the Radiochemistry Laboratory (TA-48) fire sprinkler system; and the site-wide maintenance program. The TA-48 ventilation assessment was postponed and is now scheduled to start the end of this month. The site-wide fire alarm system is planned to be reviewed when sufficient progress is made on the partial system replacement project. That assessment is now anticipated in December.

Fire Protection: The completed DOE/LANL Phase II assessments identified weaknesses in the LANL program for inspection, testing, and maintenance for fire protection systems (site rep weekly 6/14/02). While these weaknesses do not constitute an imminent hazard, LANL has prepared and is executing a corrective action plan. It appears progress is being made. LANL has completed an initial review of applicable inspection and maintenance procedures, identified improvements, and implemented compensatory measures. LANL has also developed a new surveillance procedure to improve and standardize fire protection inspections at the facility and institutional levels. Specific deficiencies found are being entered into an issue tracking system. LANL is also beginning to track mean-time-to-repair for fire protection impairments in nuclear facilities. The site rep believes that these issues are receiving and continue to warrant close management attention.

Integrated Safety Management (ISM): On June 14th, LANL issued their investigation report on the January liquid chlorine dioxide explosion in a non-nuclear facility (site rep weeklies 1/11/02, 6/28/02). The LANL investigation determined that the root cause was performance of the experiment without adequately following the LANL safe work practices, which is the LANL mechanism for implementing ISM into programmatic work.

The site rep believes that LANL conducted a technically thorough investigation. While corrective actions have been underway since the incident occurred, to the site rep's knowledge, a consolidated corrective action plan has yet to be issued. It remains unclear that a complete set of corrective actions has been identified and the extent to which they are being pursued. This likely has implications on both nuclear and non-nuclear programmatic work.

Facility Operations: LANL has a facility revitalization project with objectives that include improving productivity, integrating facility management, and optimizing safe, secure, cost-effective operations and maintenance. As part of this effort, LANL is close to implementing a more centralized management structure. A key element is that facility managers will report to an institutional lead manager. Prior to 1995, LANL had such a central organization. LANL is now trying to gain the benefits of centralized management while retaining the responsiveness of a distributed organization. Under the new system, roles and responsibilities will be defined in facility service agreements. Divisions will remain responsible for some elements, such as the authorization basis. Implementation is expected to begin next month and continue through the next year.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 13, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 13, 2002

Critical Experiments Facility (TA-18): The LANL independent Reactor Safety Committee reviewed TA-18 this week. In its closeout, the Committee observed that TA-18 is working on national priority missions; morale is high; and facility operations, management, and coordination have improved during the last 2 years. The pending relocation decision is a concern of many – particularly the consistency of vision, the continuity of mission, and the sustainability of national asset capabilities. Operationally, 4 of the 5 critical assemblies are up; 2 returned to operation in June. SHEBA remains down, but the facility has a plan to restart it in a few months. Configuration management is improving. Earlier this year, TA-18 hired 3 systems engineers with mechanical, electrical, and instrumentation/control expertise. The Committee's report is forthcoming.

Last week, DOE approved the LANL plan to implement the new TA-18 safety basis, approved by DOE in July (site rep weekly 8/9/02). The safety basis hazard analysis identified about 400 scenarios, of which about 100 challenged the evaluation guidelines. Because of similarities, these were grouped into 21 evaluation basis accidents. To address these accidents, the facility now has 11 safety class and 19 safety significant systems. DOE elevated SNM containers to safety class, since the buildings do not meet Performance Category 3 (PC-3) seismic/wind requirements. Other safety class features include safety shutdown mechanisms, seismically qualified storage configurations, shielding, building structure, the Flood Retention Structure, and one assembly's controls and seismic restraints. Some safety class features are yet to be installed – such as, a new in-core temperature measurement system – and are being addressed in the interim by compensatory measures.

TA-18 has determined the changes in hardware and procedures required, has prioritized the changes, and is managing implementation like a project (e.g., using a work breakdown structure). The facility has also prepared a cross-walk that links the new safety basis controls to the systems performing the safety functions, and to the relevant operations, maintenance, and surveillance procedures. High priority is assigned to safety basis training and certain modifications: in-core instrumentation, sample well closures, hydraulic fluid spray shields, and robust containers. A number of studies also are high priority, including those on automatic seismic isolation valves for natural gas lines, Flood Retention Structure maintenance, SCRAM response time testing improvements, and cost/benefit analysis for potential upgrades (e.g., building seismic). LANL expects to complete most high priority items during the next 3-6 months, and the longer term items during the next 18 months.

Authorization Basis (AB): DOE has 3 major upgrade packages for action, applicable to the following Hazard Category 2 (HC-2) facilities and activities: the TA-55 Plutonium Facility, submitted in April; site-wide transportation, submitted in August; and the TA-8-23 Radiography Facility, submitted last week. DOE is also evaluating a LANL request to downgrade one of the two TA-21 tritium facilities to HC-3 in preparation for deactivation. The other TA-21 tritium facility will likely be handled similarly, pending transfer of operations to the TA-16 Weapons Engineering Tritium Facility (WETF). Looking ahead, LANL anticipates submitting upgrade packages for the TA-50 Radioactive Liquid Waste Treatment Facility within the next two weeks; the TA-54 Waste Storage & Disposal Facility (Area G) in October; and the TA-50 Waste Characterization, Reduction, and Repackaging Facility (WCRR) in November.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 20, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 20, 2002

White (DNFSB staff) was on site this week observing a DOE lightning protection review.

Lightning Protection: The DOE lightning protection review followed up previous DOE reviews of the last 2 years, as well as staff observations discussed in a Board letter (8/6/02). These reviews have driven improvements, albeit slow, in the LANL lightning protection program. Progress has been hampered somewhat by informal issue transmittal, tracking, and closure by DOE and LANL.

DOE and LANL recently designated the Weapons Engineering Tritium Facility (WETF) lightning protection system as safety class, which is unique at LANL (site rep weekly 5/31/02). The DOE team questioned the appropriateness of designating NFPA 780 systems as authorization basis (AB) controls. For WETF, LANL has addressed many of the deficiencies found during the staff's May review and reinspected the system. However, during a tour this week, one air-terminal was discovered to be disconnected, illustrating the needs for clear criteria, frequent inspection, and roof top configuration control. WETF also needs to consider instrument line surge suppression. The WETF system's operability and surveillance requirements, and inspection acceptance criteria need better definition, given the safety class designation. Also, the Chemistry and Metallurgical Research Facility (CMR) system still has deficiencies that were observed during the staff's May review, particularly lack of roof perimeter air terminals. These need resolution.

Decommissioning Activities: This week, LANL conducted a management self assessment (MSA) of a subcontractor's plan to open and non-destructively characterize a pair of buried radioactive sludge tanks in TA-21 (site rep weekly 7/26/02). Estimated transuranic inventory is 200-400 gm (12-25 Ci). Safety controls are substantially improved. Regarding the potential for flammable gases and a puff release, the subcontractor believes that the tanks are not sealed and pressurized, and, if they were sealed, the lower flammable limit would not be exceeded. As precautions, the subcontractor is planning on periodically monitoring, hand excavating with non-sparking tools, and remotely opening each tank. The possibility of gas sampling before opening is being considered if an existing vent can be found. The MSA team's report is expected on Monday. DOE is reviewing the process concurrently. If approved, excavation could start next Friday (9/27/02), and characterization could be completed during the following 2 weeks

Plutonium Facility (TA-55): Last Friday morning, PF-4 shut down all ventilation in a controlled manner in order to perform annual calibration on instrument air system switches. While ventilation was shutdown, the facility was depending on confinement integrity without differential pressure to prevent a release, as permitted by the AB. Following the evolution (about 3.5 hours), TA-55 restored ventilation, confirmed no radioactivity released, and returned to normal operations. This is the second time in two months that TA-55 has had to rely on this passive filtration mode for confinement due to a minor evolution. It is driven by existing AB requirements to keep process air and nitrogen isolated from instrument air. As discussed before (site rep weekly 8/2/02), there are options. The site rep understands that LANL is examining options to decrease reliance on the passive mode and improve reliability of the instrument air system.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 27, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 27, 2002

Burnfield, Contardi, and Jordan were on site this week reviewing the internal dosimetry program, Recommendation 2000-2 status (vital safety systems), and the chlorine dioxide event followup.

Authorization Basis (AB): Last Friday, DOE provided LANL comments on the proposed on-site Transportation Safety Document, which will require its resubmittal (site rep weekly 9/13/02). DOE stated that this package was one of the first in the complex developed to meet the Nuclear Safety Management rule (10 CFR 830, subpart B); that there is little precedence for the document and its associated Technical Safety Requirements (TSRs); and that DOE headquarters also has seen questions from many sites on how to achieve a compliant Transportation Safety Document. That said, the issues raised by DOE appear to be fundamental, involving identification of hazards, derivation of a complete set of controls, quantitative justification of controls, and linkage between accident analysis and TSRs. LANL is revising the document with increased focus on quality and plans to resubmit it shortly.

Plutonium Facility (TA-55): DOE has been reviewing the TA-55 AB upgrade package since April. The site rep understands that the review cycle has been extended for the following reasons: (a) allow a DOE-LANL iteration on the proposed TSRs; (b) allow LANL to complete/evaluate fire suppression hydraulic calculations that may affect TSR setpoints; (c) allow LANL to address DNFSB issues on the new Pu-238 scrap recovery line (Board letter 4/23/02); and (d) allow LANL to improve the Transportation Safety Document. These activities are in process. The need for the fire suppression calculations is driven by issues raised by the staff in December 2001 (site rep weekly 12/21/01). In January, DOE and LANL linked these issues to the AB upgrade submittal, but the issues have since lingered. The Pu-238 scrap recovery line issues are the topic of a separate LANL process hazard analysis, expected now sometime within the next couple of months.

Integrated Safety Management: Last Friday, DOE provided LANL comments on a draft corrective action plan in response to the January liquid chlorine dioxide explosion in a non-nuclear facility (site rep weeklies 1/11/02, 6/28/02, 9/6/02). DOE observed that, while some actions have been taken, a significant length of time has lapsed between the event and the development of the corrective actions. DOE emphasized that the plan needs to capture the full scope of actions required; it needs deliverables that constitute objective evidence; and it must be formally managed and tracked to closure. Several DOE comments indicate that the site-wide implications ought to be considered, which affects nuclear facilities. In discussions with DOE and the staff this week, LANL described the actions being taken by the affected division and at the institutional level. Particularly, LANL has identified several groups that have demonstrated superior performance in Safe Work Practices. LANL is forming a team of working-level managers from those groups to identify opportunities to improve hazard identification, risk categorization, work control, training, and other areas related to the safety of programmatic work. DOE and LANL expect the corrective action plan to be finalized in mid-October.

Critical Experiments Facility (TA-18): Erosion control improvements have been pursued for the Flood Retention Structure, such as downstream gabion baskets; turf matting; and contouring and hydroseeding disturbed areas. Upstream stabilization improvements are scheduled to begin this Fall (e.g., partial spoil pile removal). Concrete core drilling is done, and a report is forthcoming.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 4, 2002

TO: J. K. Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 4, 2002

The site representative was at DNFSB-Headquarters in Washington, D.C. this week. This report is submitted for continuity purposes only.

cc
Board Members

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 11, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 11, 2002

Recommendations 94-1/2000-1: LANL has placed the unsheltered containers on cradles intended to prevent their motion during an earthquake.

Radioactive Liquid Waste Treatment Facility (RLWTF): On Tuesday, DOE provided LANL comments on the proposed new RLWTF authorization basis (AB). Since 1963, the TA-50 RLWTF has collected, treated, and disposed of LANL radioactive and other liquid wastes. LANL anticipates a line item for a replacement facility in FY 06 and decommissioning the current facility tentatively in 2010. The facility currently operates as a Hazard Category 3 (HC-3). DOE and LANL are taking less credit for segmentation in the new AB and are pursuing HC-2.

LANL proposed no safety class systems, based on low predicted consequences to the public from the bounding accident – a seismic induced fire (i.e., about 10% of the evaluation guidelines). As safety significant, LANL recommended the fire suppression system, the transuranic waste tanks/piping, and the transuranic caustic storage tank vents. The facility's safety posture depends on generator facilities not exceeding limits, and LANL discussed a source term limit (120 Ci alpha) as a Technical Safety Requirement (TSR). DOE considers the AB needs improvements before it can be approved, particularly in controlling the inventory, analyzing the aircraft crash accident and fire suppression effectiveness, and evaluating seismic and other natural phenomena hazards against Performance Category 2 requirements. LANL is working on the resubmittal.

Authorization Basis (AB): The DOE site office AB team has assigned highest priority to achieving safety bases that are compliant with the DOE Nuclear Safety Management Rule (10 CFR 830) by April 2003, but resources are limited. Consequently, several other activities with AB implications are being affected: such as the LANL facility management realignment, the TA-21 radioactive tank characterization, and the TA-50 RLW tank upgrades (see site rep weeklies 9/6/02, 9/20/02, and 8/30/02, respectively).

The facility management realignment is motivated by real needs, but key questions exist on execution: particularly on the chain of command and the roles and responsibilities for the AB and for AB-designated safety systems. The TA-21 tank characterization begins to address a legacy waste issue that has persisted for decades. The TA-50 tank upgrades address lessons learned during the Cerro Grande fire, when the RLWTF had to be continuously manned. Similar impacts for other emergent operational or programmatic issues may occur between now and April 2003.

Chemistry and Metallurgical Research Building Replacement Project (CMRR): Geotechnical /seismic investigation fieldwork could begin October 21st, pending receipt of permits. The investigation focuses on a primary and two alternate locations. The scope includes 2 deep and 4 shallow seismic characterization borings (~600' and 150' deep, respectively), and 45 geotechnical characterization borings (50'-100' deep). Most of the latter are arranged in a 100' by 100' grid pattern over the primary location. Existing boring data is also used, which includes one deep boring. LANL intends that this effort address all the potential design data needs. The staff is reviewing the plan.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 18, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 18, 2002

Martin, Schapira, and Stevenson (OE) were here this week reviewing quality assurance.

Quality Assurance (QA): LANL is making incremental progress in improving institutional QA (site rep weeklies 8/30/02, 1/11/02, 10/19/01). For example, the Institutional Quality Management Implementation Plan has been in development for more than 5 months and, although improved, continues to be draft. The draft plan calls for a 2 year implementation schedule. Several divisions and projects need quality programs in place sooner and are putting programs in place now – independent of the institutional effort. The primary mechanism intended to coordinate the institutional effort with the divisions and projects is a policy-making Steering Group and a lower-tier Working Group. The Steering Group has met several times since the Board's last visit (7/18/02). The Working Group, charged with refining and coordinating implementation details, first met last week and still appears to lack definitive direction and assigned membership.

On the positive side, higher-tier documents to standardize procurement quality have been developed, and a computerized system is to be implemented in December. Also, some LANL divisions with nuclear facilities have established formal QA programs (NMT) or plan to do so within the next 6 months (DX, ESA). However, these efforts have not been coordinated with the institutional effort. The likelihood of disparate programs persisting in the future could be reduced if such coordination took place and if these division had representatives on the Working Group. While improving QA has senior DOE/LANL management attention, the rate of progress on the institutional program during the last year appears inconsistent with this being assigned a high priority.

Integrated Safety Management (ISM): Increased attention may be warranted to personnel complying with safety requirements (i.e., formality of operations), based on the following isolated events: (1) About 2 months ago, two technicians in one facility experienced mild electrical shocks in two separate events – one attributed to equipment failure and the other to a lock-out-tag-out failure. DOE and LANL have followed up. (2) On September 26th, two craft personnel accessed a radiography facility roof while intermittent radiography operations were being conducted and contrary to access controls. Event reconstruction and preliminary dose assessments indicate no dose was received. (3) More recently, a subcontractor damaged a gas line while modifying a non-nuclear new-construction facility. The damage was discovered later when the gas line was pressurized. (4) Also recently, one nuclear facility had a room become contaminated due to poor waste handling practices, effectively shutting down that room's operations. Occupants discovered the room was contaminated one evening, but it wasn't reported until next morning. In the interim, the room was an unposted contamination area. The site rep has discussed these events with DOE/LANL management.

Chemistry and Metallurgical Research Building (CMR): CMR has completed ventilation repairs to Wing 3 and is restoring it to normal operations. All CMR wings will then be operational. Wing 3 hoods are still out of service, but will be systematically function-checked. Individual processes will be started up after the process hazards are reviewed and readiness confirmed according to division procedures. Wing 3 will be primarily used for uranium operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 25, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 25, 2002

Authorization Basis (AB): DOE and LANL are updating numerous ABs this year. Implementation and verification appear to warrant more management attention, as well as more rigorous planning, coordination, and resource-loading (site rep weeklies 7/12/02, 8/9/02).

The Weapons Engineering Tritium Facility (WETF) is the first LANL facility with an updated AB. This week, WETF temporarily secured operations because of overdue commitments for implementing new Technical Safety Requirements (TSRs). In July, DOE and LANL agreed upon the implementation schedule. About half the commitments were due this week. Last week, WETF proposed slipping about half of the commitments, based on recent operational and programmatic demands, as well as on a slip in the contractor operational readiness review (ORR) – intended, in part, to verify AB implementation. This ORR is now scheduled to start Nov 12th. DOE has informed LANL the proposed schedule changes are unacceptable. LANL has requested clarification.

The Critical Experiments Facility (TA-18) is the second LANL facility with a major updated AB. While implementation is well planned (site rep weekly 9/13/02), it remains to be seen whether it will be successful. Longer term, LANL has plans to establish an Operations Support Group to assist nuclear facilities in formality of operations and AB implementation. That initiative appears to be lagging due to funding issues.

Integrated Safety Management (ISM): The site rep understands that LANL has an independent team reviewing the event, reported last week, involving crafts personnel accessing a radiography facility roof while intermittent operations were being conducted. This is positive.

On October 10th, DOE concurred with the LANL corrective action plans for the January liquid chlorine dioxide explosion in a non-nuclear facility (site rep weekly 9/27/02). The affected LANL division has completed about half of their corrective actions. Also, LANL is forming a team to review hazard analyses processes, to identify best industry practices (based on a study of outside organizations), and to recommend improvements. If fully pursued, this should lead to institutional improvements to both LANL hazard analysis tools and safe work practices. The latter is LANL's mechanism to implement ISM into programmatic work for both nuclear and non-nuclear operations.

Critical Experiments Facility (TA-18): Last week, LANL announced that a criticality experiment had been completed in the Planet assembly involving a 6 kg nickel-clad neptunium-237 (Np-237) sphere and about 60 kg of highly enriched uranium. Preliminary data reportedly shows that the critical mass for Np-237 is less than expected based on computer models. Future experiments will determine the Np-237 critical mass with various reflectors. This series of experiments was 12 years in preparation and was done in support of DOE programs for criticality safety, non-proliferation, and emergency response. TA-18 has the only operational general-purpose machines in the United States capable of these types of experiments.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 1, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 1, 2002

The site rep was off site Monday through Thursday.

Plutonium Facility (TA-55): The Fire Protection Yard Main Replacement Project continues to make progress and is receiving increased management attention because of previously reported cost/schedule issues (site rep weekly 8/30/02). PF-4 work is completed. East pumphouse and water tank improvements should be completed within a few weeks. Two major sections of loop piping and two sets of lead-in piping remain. DOE expects the entire replacement system (i.e., connection to all the buildings) to be operational in December.

Waste Management: DOE-EM and LANL have committed to accelerating LANL characterization and offsite shipment of Transuranic (TRU) and Mixed Low Level (MLLW) legacy waste by 20 years (i.e., from 2030 to 2010). In particular, they are working to accelerate shipment of about 2,000 drums of higher-wattage TRU waste from TA-54 to WIPP by the end of FY04. This effort – referred to as the "Quick-to-WIPP" initiative – will result in a significant risk reduction for TA-54 once it is completed. While these 2,000 drums comprise about 8% by number of the TA-54 TRU drums, they are about 60% of the TA-54 accessible (above-ground) and potentially-dispersible TRU inventory.

WIPP shipments must be accelerated to achieve the planned TRU waste shipping schedule and the Quick-to-WIPP risk reduction. Two WIPP shipments were completed in FY02. LANL and the DOE Carlsbad Field Office are working to complete more than 90 shipments in FY03. In October, LANL made 3 shipments and plans another shipment next week. Future challenges include upgrading the Authorization Basis (AB) for existing waste characterization, packaging, and loading operations, as well as for new operations involving a modular unit for visual examination/repackaging and two full characterization lines.

Readiness Assessments: DOE and LANL are making needed improvements to their process for readiness assessments (RAs) and operational readiness reviews (ORRs). The site rep previously reported that the process is more expert-based than standards-based; that weaknesses in the process may have contributed to a nuclear facility performing an evolution in July before DOE validated that approved controls were in place; and that uncertainty exists in how the process will be used to validate the phased implementation of new Technical Safety Requirements (site rep weekly 8/16/02).

DOE has reviewed and LANL has issued formal institutional requirements for startup and restart of facilities and activities (LIR 300-00-08.0). A LANL supporting guidance document is nearly completed. The DOE Site Office is also formalizing its internal roles and responsibilities for assessing readiness. The site rep understands that facility coordinators will receive training on the new requirements next week. While there remains much to be done in this area (particularly for assessing the new AB implementations), this constitutes progress.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 8, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 8, 2002

Weapons Engineering Tritium Facility (WETF): WETF is in the process of transition from an old authorization basis (AB) to a new, improved one. On October 25th, the site rep reported that WETF temporarily secured operations because of overdue commitments for implementing new Technical Safety Requirements (TSRs). This action was driven by an AB compliance issue and did not constitute an emergent safety issue, since the facility continues to operate safely under the previous AB. However, it demonstrates the difficulties that can arise during the process of TSR development, implementation, and verification. A facility may need to operate for an extended period under an old AB, while developing procedures, training personnel, and finally demonstrating capability to comply with a new one. During this period, there is potential for confusion.

WETF is currently conducting a management self-assessment (MSA) for both starting up Building 450 and implementing the new TSRs. WETF management believes that the facility is close to meeting the overdue commitments and that it will demonstrate implementation during a contractor operational readiness review, scheduled to begin shortly. Next week, a DNFSB staff team will be on site reviewing the status of TSR implementation at LANL facilities, including WETF.

Plutonium Facility (TA-55): On August 9th, the site rep reported that LANL is considering engineered solutions in place of administrative controls for the new Pu-238 scrap recovery line and that DOE/LANL had slipped the project to allow time to address issues raised in a Board letter (4/23/02).

While progress was made in August and September, the project may now be backsliding. For example, the site rep learned this week that the ion exchanger reservoir concept is no longer being pursued based on results from a challenging and potentially questionable resin dryout calculation. Resin dryout could lead to conditions conducive to an energetic reaction. The significance of such a reaction is being reevaluated but was previously deemed to require Safety Class controls. The reservoir concept was a relatively straightforward engineered feature intended to extend the period before resin dryout, although it perhaps needed refinement to expand the range of upset scenarios it addressed. For the same reasons, the project is also not considering automatic detection or alarms that might provide early indication of leaks or losses leading to resin dryout. On another issue, the project has not examined alternatives nor substantiated cursory estimates for modifications to address the solution transfer strategy questions (i.e., their proposed use of temporary flexible tubing).

On the positive side, the project expects, within a week or two, to submit to DOE a revised process hazard analysis (PrHA). The site rep has been told that the PrHA will address all the questions and issues, include a more thorough examination of the hazards, and propose better safety controls and engineered features. The project has been proceeding at risk in parallel with the revised PrHA development. Before it can proceed to readiness assessments, the PrHA will be reviewed by the responsible LANL division, by an independent LANL team (the Office of Authorization Basis), and by the DOE Site Office. Given the potential weaknesses discussed above, this should represent a good, thorough test of the DOE/LANL authorization basis review and approval process. The site rep is communicating concerns with the direction of this project with DOE/LANL management.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 15, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 15, 2002

Bamdad, Jordan, and Martin were here this week reviewing Technical Safety Requirement (TSR) implementation. Also, a DOE Price-Anderson Office of Enforcement team was here reviewing recent TSR non-compliances and radiological events in defense nuclear facilities.

Authorization Basis (AB): LANL is quickly standing up the new Operations Support Group to assist nuclear facilities in consistently implementing new TSRs and improving formality of operations (site rep weekly 10/25/02). The Weapons Engineering Tritium Facility (WETF) is the first at LANL to be implementing new TSRs, followed closely by TA-18 (the Critical Experiments Facility). Coordination and planning for WETF have been problematic, but several key issues appear to have been resolved on Thursday. The current plan is that LANL will verify implementation of most of the TSRs during the upcoming LANL operational readiness review (ORR) and consider phasing in the new TSRs in a controlled manner soon thereafter. DOE will observe the LANL ORR verification. The previous plan was to implement the new TSRs all at once after the DOE ORR, now scheduled for January. While there are differences in verification strategy, the phased-in approach is similar to that taken by TA-18 and is advantageous if properly sequenced. It places more rigorous operational controls in place sooner and could reduce the potential for confusion caused by operating to one set of rules while practicing to another for an extended period.

Weapons Engineering Tritium Facility (WETF): Besides improved operational controls, the new WETF AB mandates using improved tritium storage containers and considering upgrades to fire walls that are currently 1 hour rated (site rep weeklies 8/10/01, 4/19/02, 4/26/02). In fact, 65% of the inventory is suppose to be in improved containers by April 2003. Last April, DOE advised LANL that higher temperature-rated seals need to be used on tritium storage containers and that alternatives could be considered. It appears that, based on progress made, increased management attention may be warranted on reaching agreement and aggressively pursuing engineered features that more fully address WETF fire scenarios and thereby achieving the intent of the new AB.

Integrated Safety Management: LANL has investigated several recent events and identified personnel not following existing requirements as a cause or a contributor to these events (e.g., site rep weeklies 10/18/02, 10/25/02). While corrective actions have been taken in each case in the affected facility, there is an increasing recognition here among management that the needs exist to (1) clearly identify management expectations and (2) possibly extend actions to other facilities or institutionally. Also being considered is the need to improve trending and evaluation of lower-tier events that could be precursors to more significant events or serious accidents, thereby increasing visibility to management of emergent safety trends. If pursued, these would be positive actions.

Plutonium Facility: The site rep understands that LANL expects the revised process hazard analysis for the Pu-238 scrap recovery line to be submitted to DOE on December 2nd.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 22, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 22, 2002

Pajarito Laboratory (TA-18): TA-18 has secured higher-energy radiography and radioactive source operations pending determination of why two people had unanticipated, elevated gamma dosimetry results in October. The results were less than one-fifth of the federal annual limit (5 Rem) but appear high for this type of operation if it is properly controlled. LANL is also reviewing relevant hazard control plans to ensure hazards are properly identified and appropriate controls are in place.

Also, progress has stalled in reducing the TA-18 inventory of excess SHEBA uranium solutions (site rep weekly 8/9/02). In August, TA-18 started to ship these solutions, one bottle at a time, to the Chemistry and Metallurgical Research Building (CMR) to be converted into salt, packaged, and returned to TA-18. CMR has had operational problems with the conversion, including continuous air monitor alarms. CMR is addressing the problems and planning a management self-assessment before resuming this activity. LANL anticipates relocating this operation within CMR in January to make room for new cleanout equipment for the large metal vessels under Recommendations 94-1 /00-1. While progress on cleaning out the large vessels has been long in coming, this is likely to further delay conversion of the TA-18 excess solutions. Close coordination appears warranted.

Weapons Engineering Tritium Facility (WETF): The LANL operational readiness review (ORR) for Building 450 startup and TSR implementation began this week. The site rep understands that the ORR team is doing a thorough job, but that the ORR is being extended. This has raised good questions on the facility's state of readiness and whether the ORR is shifting to a management-assist. The DOE Site Office is pursuing these questions. Also this week, the DOE Site Office approved with comment a WETF fire hazard analysis crosswalk, a fire suppression system failure modes and effects analysis, and an electrical code inspection/replacement program. These evaluations were required as conditions of approval in the DOE Safety Evaluation Report in April. These should increase focus on fire protection upgrades that could enhance facility safety.

Decommissioning Activities: LANL is updating neutron activation calculations and hazard analyses and controls for Omega West Reactor (OWR) decontamination and decommissioning (D&D), following last Friday's determination that radionuclide inventory may exceed the Hazard Category 3 (HC-3) level. The activation products (e.g., tritium, cobalt-60) are likely bound to some degree within the material matrix of the vessel and its components, including a beryllium reflector. DOE/LANL downgraded OWR to a radiological facility in 1995, possibly based on low expected dispersability. Currently, the reactor area is contained within a tent with HEPA filtration and will receive a weekly combustible material survey. The reactor itself is capped with a metal plate. LANL has secured D&D operations in the reactor area but resumed such operations in the adjacent office and laboratory, which are separated from the reactor area by a berm. The DOE Site Office has pointed out that this demonstrates the need for vigilance before downgrading nuclear facilities. LANL has several facilities (e.g., TA-21 tritium facilities) which are being considered for downgrading and D&D.

Chemistry and Metallurgical Research Building Replacement Project (CMRR): Geotechnical/seismic investigation fieldwork began last Friday (site rep weekly 10/11/02).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 29, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 29, 2002

The laboratory was closed Thursday and Friday.

Radiochemistry Laboratory (TA-48): TA-48 is operating as a Hazard Category 3 (HC-3) nuclear facility under a justification for continued operation (JCO). In August, DOE approved a new TA-48 authorization basis (AB) for a 2 year interim period, consisting of a Basis for Interim Operation (BIO) and Technical Safety Requirements (TSRs), as discussed in site rep weekly 8/16/02.

Last Friday, DOE approved the TA-48 TSR implementation plan. The site rep understands that implementation is to be essentially completed by mid-January 2003 and ready for verification. This schedule appears compressed, and the effort has not started well. On October 2nd, the facility reported to DOE that counting facility propane sensors had been reset from 30% to 25% LFL, consistent with the DOE approval memo, but mid-November inspections determined that the reported change had not been made. Thorough verification of TSR implementation appears warranted.

Authorization Basis (AB): On November 8th, the DOE Site Office approved the LANL on-site transportation safety document (TSD) and associated TSRs (site rep weekly 9/27/02). The DOE preference is for LANL shipments to fully comply with Department of Transportation (DOT) requirements. However, in some cases, DOT certified or equivalent packages are not available due to physical configuration or other reasons. The TSD provides a framework for those cases and for the development of on-site, activity-specific controls that ensure the level of overall safety is maintained. These controls are to be captured in DOE-approved transportation plans. DOE directed that existing transportation plans be reviewed in the context of the new AB (e.g., vehicle speed and weather limitations), and resubmitted for approval. Implementation is also to be verified.

Facility Operations: DOE is close to acting on a LANL proposed site-wide JCO that would allow a major facility management realignment (site rep weeklies 9/6/02, 10/11/02). The proposed realignment involves consolidating numerous facility management organizations under a single, institutional lead manager. The goal is that this unified organization would then move forward to identify, plan, and implement needed organizational improvements while minimally impacting nuclear facility operations. LANL has stated that roles and responsibilities during the transition would remain consistent with current, specific AB requirements.

Specifically, each owning division leader would continue to be responsible for the AB and AB compliance, for the division's facilities and buildings, and for programmatic equipment and operations. The division leader would delegate authority for the building envelope to the institutional lead manager, which would then pass to the deployed facility manager. Facility Service Agreements are being developed to define roles, responsibilities, authority, and accountability. LANL will also conduct readiness reviews prior to realignment. Before the JCO expires (4/10/03), LANL will review the organizational changes against facility AB documents to determine what changes, if any, are necessary to the ABs.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 6, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 6, 2002

Hadjian, Jordan, Jones, Ralston, and Rizzo (OE) were on site this week reviewing the CMRR geotechnical investigation, the LANL ground motion design criteria, the TA-18 flood retention structure, and the status of new projects, including the new Emergency Operations Center.

Facility Operations: The DOE site office has approved the LANL facility management realignment proposal discussed last week. DOE requested more details be provided within 30 days.

Critical Experiments Facility (TA-18): DOE and LANL have designated the flood retention structure (FRS) as safety class, but resolution of the Board's structural questions of a year ago has been slow (site rep weeklies 9/13/02, 6/28/02, 12/28/01, 11/9/01). Results from Army Corps of Engineers testing of the roller-compacted concrete are now expected in March 2003. Preliminarily, it appears that the concrete long-term durability (e.g., 2 decades) may be affected by alkali-silicate reactions leading to micro-cracking. The period of increased flood risk may also extend beyond the original 3 year estimate, due to recent drought and inhibited post-fire recovery. Low rainfall also means little measured runoff data to substantiate flood models, increasing uncertainty in projections. Timely completion of testing and analyses appears warranted to confirm FRS adequacy for an extended period.

Plutonium Facility (TA-55): Last week, DOE requested LANL resubmit a process hazard analysis for a TA-55 laser ablation experiment. The experiment involves eroding a plutonium (Pu) metal sample using a low-energy pulse laser, reacting the released Pu with a gas, depositing it on a cryogenic surface, and studying the frozen matrix with an infrared spectrometer. The Pu sample is loaded into a custom-made assembly, called a cryohead, while inside a glovebox or hood. The cryohead is removed from the glovebox and mounted on the spectrometer, thereby becoming the primary containment. LANL declared the experiment a positive Unreviewed Safety Question Determination (USQD) based on use of a containment not described in the authorization basis. DOE requested that LANL determine the maximum amount of Pu that could be vaporized by the laser (rather than assume the entire sample is vaporized in an unmitigated accident) and provide rationale for designating the cryohead as a safety-significant design feature, requiring TSR controls.

Waste Management: The TA-54 Radioassay and Nondestructive Testing facility (RANT) is key to the Quick-to-WIPP risk reduction program, since it is used to load shipping containers for WIPP (site rep weekly 11/1/02). RANT is currently a Hazard Category 3 (HC-3) nuclear facility and doesn't meet Performance Category 2 seismic requirements. To support Quick-to-WIPP, LANL has proposed raising RANT's inventory limit seven-fold (i.e., to 6 kg Pu equivalent) and operating RANT as HC-2 under a limited-life Basis for Interim Operation (BIO). This BIO would expire on June 1, 2003 or when a full RANT BIO is implemented, whichever occurs first. The proposed interim controls are primarily administrative. DOE action may occur quickly since LANL would like to initiate higher-inventory shipments within a few weeks. The full BIO is expected in March 2003 and may propose upgrades, including seismic.

Weapons Engineering Tritium Facility (WETF): The LANL Operational Readiness Review (ORR) resumed this week and will likely be completed by December 17th. WETF used the break last week as an opportunity to improve operations with respect to earlier ORR team observations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 13, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 13, 2002

The site rep was off-site this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 20, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 20, 2002

Jordan was on site this week reviewing the status of the TA-18 mission relocation conceptual design.

DOE-NNSA Management: Effective today, the NNSA Los Alamos Site Office reports directly to headquarters. NNSA expects this office's staff to increase from 75 to 95 personnel by October 2004 to support the increased local mission. Staffing plans are due in January. NNSA has also set an objective that its work force will be certified to ISO 9001 (a quality management standard) in 2004.

Weapons Engineering Tritium Facility (WETF): The LANL Operational Readiness Review (ORR) was completed last week. The ORR team briefed their findings this week and will issue their report early next month. The scope included Building 450 startup and new authorization basis implementation (i.e., new Technical Safety Requirements - TSRs). During the 3-week review, the team identified about 46 pre-start findings, 11 post-start findings, and 45 observations. WETF has been closing pre-starts as the ORR progressed. About 2 dozen remain open, mainly involving TSR implementation and related operator training and qualification. Four safety system surveillance procedures also need to be rewritten and were not reviewed by the ORR team. In January, WETF plans to bring in the new LANL Operations Support Group to mentor the facility (site rep weekly 11/15/02). Timing of the LANL declaration of readiness and the DOE ORR are both open.

The site rep believes that WETF has been working hard to get the new TSRs implemented, but much remains to be done. Longer-term, LANL needs to improve the readiness assessment process – particularly, broad-based understanding of the process – to be consistent with DOE requirements.

Radiochemistry Laboratory (TA-48): The Recommendation 2000-2 Phase II confinement ventilation review is complete. The review team found issues with the as-built configuration, the configuration and maintenance management programs, and conduct of operations. The report concluded that the facility was unable to fully demonstrate operability and reliability of confinement ventilation commensurate with the facility's Hazard Category 3 (HC-3) rating.

TA-48 is 46 years old and was designated a HC-3 nuclear facility in recent years, apparently with few substantive changes. Since August 2000, it has operating under a Justification for Continued Operation. In August 2002, DOE approved a two-year interim authorization basis that LANL has committed to implement by February 2003. LANL has also committed to reducing inventory and downgrading TA-48 to a radiological facility within 2 years. LANL may expedite this due to recent events. Given the nature of the Phase II findings, as well as fire protection, electrical, and seismic deficiencies, it appears that improvements may be needed, even if the facility is down-graded, if it is to operate as a radiological facility for an extended period (site rep weeklies 8/16/02, 11/29/02).

Plutonium Facility (TA-55): LANL has delayed submittal of the revised process hazard analysis (PrHA)

for the Pu-238 scrap recovery line. LANL independent review of the PrHA is underway.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 27, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 27, 2002

The laboratory was closed Wednesday through Friday.

Plutonium Facility (TA-55): On December 17th, NNSA sent LANL a preliminary notice of violation for unauthorized TRU waste staging and storage in PF-185 (site rep weeklies 8/24/01, 9/7/01).

Authorization Basis (AB): On December 11th, the NNSA site office established a standard site boundary for safety analyses. NNSA has observed several variations on the assumed site boundary in dose calculations for postulated nuclear facility accidents. The standard site boundary appears more conservative than that assumed in some prior analyses - particularly, the use of the full length of East Jemez Road in addition to the Royal Crest Trailer Park boundary.

The site boundary question is complicated since LANL has commercial ventures on site and public access roads passing through the site. Per DOE STD-3009, NNSA considers such roads to be within the site boundary if NNSA or LANL has the capability to control the road during an emergency. By agreement, commercial ventures on LANL property are subject to LANL emergency evacuation procedures and are not considered public receptors. NNSA expects the standard site boundary to be incorporated in the next annual update of nuclear facility safety analyses, if not made sooner.

Pajarito Laboratory (TA-18): The site rep understands that the unanticipated gamma dosimetry results for two individuals in October have been traced to an evolution that was conducted off site (site rep weekly 11/22/02). It appears that the dosimetry results may not represent actual doses to the individuals, but this is still being investigated. Weaknesses in controls may have contributed to this event (e.g., dosimetry requirements during off-site activities and during betatron operations).

Decommissioning Activities: LANL is pursuing removal of reactor components from the Omega West Reactor (site rep weekly 11/22/02). The radioactive inventory is principally tritium and cobalt-60 in the beryllium reflector and its supporting steel and aluminum framework. Estimated contact radiation levels are 1,100 R/hr, necessitating short-duration and remote operations.

NNSA has specified a number of administrative controls at the safety-significant level, including: minimize local combustible loading; secure unrelated local operations; secure operations if there is a loss of ventilation; inspect and certify lifting and rigging equipment; reevaluate rigging if remote video inspection identifies reflector damage occurring during the lift; remove as single unit to minimize releases; and ship in a shielded cask and dispose in TA-54 within one day of packaging.

Waste Management: NNSA and LANL have identified weaknesses in interpretation of surveillance requirements for the TA-50 Waste Characterization, Reduction, and Repackaging Facility (WCRR), a HC-2 nuclear facility. The weaknesses mainly involve the frequency and extent of inspections verifying waste drum inventory. LANL is invoking stricter data recording on daily drum movements and will revise operations and facility procedures by end of February. Longer-term, LANL is preparing a proposed updated authorization basis for WCRR operations that may address the weaknesses.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 3, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 3, 2003

The laboratory was closed Monday through Wednesday.

LANL Management: University of California (UC) has announced the resignation of the LANL Director and Principal Deputy Director, effective January 6th. An interim Director has been appointed.

Waste Management: NNSA has approved the limited-life Basis of Interim Operation (BIO) for the TA-54 Radioassay and Nondestructive Testing facility – RANT (site rep weekly 12/6/02). This allows RANT to package Hazard Category 2 inventories of waste for expedited shipment to WIPP during the next 6 months. NNSA estimates this will reduce TA-54 (Area G) risks nearly 30 percent.

Authorization Basis (AB): NNSA and LANL face challenges in upgrading ABs before April 2003 per the Nuclear Safety Management rule (10 CFR 830) – particularly for solid and liquid radioactive waste operations (TA-50, TA-54) and for the Plutonium Facility (TA-55). Progress has slowed since September (site rep weekly 9/13/02). The site rep understands that LANL anticipates making submittals for the TA-50 Waste Characterization, Reduction, and Repackaging Facility (WCRR), the TA-50 Radioactive Liquid Waste Treatment Facility, and the TA-54 Waste Storage & Disposal Facility (Area G) within the next few weeks.

The TA-55 AB upgrade appears problematic, and its current status is unclear. LANL made a massive submittal in April 2002 (i.e., about 6,500 pages). NNSA provided informal comments last summer, and LANL began an iteration on the Technical Safety Requirements. In September, NNSA and LANL indicated a delay was occurring to allow finishing fire suppression hydraulic analyses and to satisfy competing demands – including revisions to analyses for the Pu-238 scrap recovery line and for LANL site-wide transportation (site rep weekly 9/27/02). During the extended review process, key reviewers appear to have become unavailable. The TA-55 AB was last revised in 1996. This submittal is suppose to address a number of issues, including Board issues, that have risen in the interim.

Critical Experiments Facility (TA-18): NNSA has decided to relocate the TA-18 security category I/II activities to the Device Assembly Facility (DAF) at the Nevada Test Site (NTS). This includes four of the five critical assemblies, 2.4 MT of special nuclear material (SNM), and about 10 MT of thorium and natural and depleted uranium. The record of decision (ROD) was signed on December 5th and distributed more recently. NNSA also announced that the security category III/IV activities, including the Solution High Energy Burst Assembly (SHEBA), would be addressed in a separate ROD in 2003. The drivers for relocation are the increasingly high security costs and aging infrastructure at TA-18. Considering the alternatives, the ROD indicates that the DAF option offered the least construction risk (considering facility age, design complexity, and extent of modifications) but has potential for higher material transportation and life-cycle costs. The latter is due to the campaign mode contemplated. The site rep understands that the tentative project milestones are conceptual design (10/03); preliminary design (10/04); construction start (10/05); construction completion (4/08); move completion (2009). A few of the challenges are maintaining key criticality training and research capabilities, including key personnel, thorough this transition.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 10, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 10, 2003

Von Holle was on site this week reviewing preliminary safety analyses for an experiment and potential improvements in safe work practices. Also, the site rep attended a Standing Management Team meeting in Albuquerque to determine the status of laboratory support for Pantex operations.

Radiochemistry Laboratory (TA-48): LANL has temporarily suspended operations in the TA-48 Alpha Wing and is reducing radioactive inventory as a result of the 2000-2 Phase II confinement ventilation review and recurring issues with formality of operations (site rep weekly 12/20/02). With this week's shipments, LANL believes the current inventory is about 75 % of the Hazard Category 3 (HC-3) lower limit, which may permit TA-48 to be downgraded to a radiological facility. NNSA and LANL are currently pursuing two tracks in parallel: (a) evaluate mission impact, inventory, and the inventory management system to support a likely LANL proposal to downgrade TA-48 and (b) pursue implementation of the HC-3 authorization basis by February 5th, as previously planned.

The site rep believes the TA-48 issues extend beyond the confinement ventilation system, considering cumulatively last year's two Phase II assessments (i.e., fire suppression, confinement ventilation), the NNSA safety evaluation report findings (e.g., seismic, fire protection), and occurrence reports (e.g., perchlorate controls, circuit breaker arcing). It may be worthwhile for TA-48 to improve formality of operations and then demonstrate they can appropriately control hazards and the inventory, maintain safety systems in an operational status, and apply adequate controls (e.g., meet 10 CFR 835), even if the facility is downgraded to the radiological facility level. Longer term, the safety issues raised in the NNSA safety evaluation report still appear to warrant being addressed.

NNSA Technical Staffing: NNSA technical staffing issues raised by the Board more than a year ago persist at this site, particularly a shortage of local qualified subject matter experts (ref: Board letter 10/10/01). For example, given the scale of LANL activities, the NNSA site office would appear to rate a full-time emergency management specialist. Instead, emergency management is a collateral duty of the single site office industrial hygienist. The DOE Office of Assessment identified this as a weakness last year. Also, LANL facility maintenance practices are a well-recognized area needing improvement, as previously reported. The NNSA site office currently lacks even a part-time maintenance specialist. Additionally, the site office authorization basis team is tasked with technically reviewing extensive ABs for plutonium and radioactive waste facility operations. Several of these ABs are already submitted or to be submitted during the next few months. This team is currently understaffed by one-third and is being supervised, on an acting basis as a collateral duty, by another site office manager. NNSA is now reviewing complex-wide federal staffing needs, including the needs of this site office (site rep weekly 12/20/02).

Integrated Safety Management (ISM): LANL has formed a team to review hazard analyses processes, to identify best industry practices (based on a study of outside organizations), and to recommend improvements. This was a corrective action from the January 2002 liquid chlorine dioxide explosion in a non-nuclear facility (site rep weekly 10/25/02). The site rep understands that the team is considering improvements to institutional requirements for initial risk determination, independent and management review, hazard assessment training, and other areas. This is positive.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 17, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 17, 2003

Safety-Related Infrastructure: On January 9th, DOE directed LANL to deobligate remaining Cerro Grande appropriation funds, currently estimated at \$75M. The impact is still being evaluated; however, it appears far-reaching and will likely result in cancellation of projects that address significant vulnerabilities identified during and after the Cerro Grande fire (May 2000) – such as partial site-wide fire alarm system replacement and radioactive liquid waste facility upgrades.

The site-wide fire alarm project was intended to address significant vulnerabilities with the current system, which is about 2 decades old and an order of magnitude more complex than originally intended. It did not evolve in a controlled manner. It is a shared system with other demands that often automatically have higher signal transmission priority. LANL has reported numerous problems with the system, including a 2001 event when it took about 15 minutes for a fire alarm signal to reach the central alarm station. While LANL has compensatory measures in place (e.g., operator training to both pull the alarm and call 911), the current system suffers from reliability issues that appear to adversely impact not only life-safety but also timely emergency response for nuclear facilities.

The radioactive liquid waste facility upgrades are part of waste management risk mitigation. This facility is nearly 4 decades old and had to be manned during the Cerro Grande fire to prevent environmental release of low-level radioactive and chemical liquid waste. The upgrade project would have added a new pumping station, new influent monitoring and control capability, and new influent storage capability – reducing the probability of a radioactive/chemical environmental release.

Plutonium Facility (TA-55): Last Wednesday, a worker was opening an inner container of Pu-238 in a glovebox using vise grips and “felt” the outer container grab the glovebox glove. The worker observed a spot on the glove, closed his fist, and alerted others. Radiological controls personnel responded. Non-involved personnel evacuated the room. Personnel remaining in the room donned respirators. The worker then withdrew his hand from the glovebox while Radcon personnel simultaneously rolled up his surgeon’s glove. During the event, there were no airborne monitor alarms and no measurable release of contamination. Nasal smears were negative. The site rep believes that the immediate actions and followup review by the facility were thorough and appropriate. This reflects well on the facility’s training and preparation. However, the consequences of this event could have been more significant if the worker had been less observant (i.e., Pu-238 contamination release into a room with personnel not in respirators). While operators appear to have followed procedures (e.g., can edges were taped), it may be appropriate to confirm that sufficient actions are being taken to prevent glove-tears, particularly for Pu-238 operations.

Authorization Basis (AB): LANL has submitted for NNSA approval the TA-54 (Area G) updated AB, the TA-55 updated technical safety requirements (TSRs), and the TA-55 revised process hazard analysis for the new Pu-238 scrap recovery line (site rep weeklies 12/20/02, 1/3/03). Also, NNSA has approved downgrading the Radioactive Materials, Research, Operations and Demonstration Facility (RAMROD) from Hazard Category 2 (HC-2) to a radiological facility, based on an estimated Pu holdup less than one-quarter the radiological facility limit. RAMROD has been in cold standby for 3 years and will be used for personnel training and process development for plutonium operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 24, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 24, 2003

Safety-Related Infrastructure: Senator Pete Domenici's office issued a press release this afternoon indicating DOE will restore the \$75M Cerro Grande recovery funding suspended on January 9th.

Radiochemistry Laboratory (TA-48): This week, LANL began a readiness assessment (RA) to verify implementation of the new TA-48 authorization basis for Hazard Category 3 nuclear operations (site rep weekly 1/10/03). One key area being assessed is the facility's ability to manage and control its radioactive inventory and thereby assure that assumptions made in accident analyses are not violated. Inventory management and control is also a key factor if TA-48 is to be downgraded to a radiological facility in the near future. The site rep understands that the LANL RA team is identifying problems in this and other areas. A staff review of TA-48 is scheduled for next Thursday.

Plutonium Facility (TA-55): The Fire Protection Yard Main Replacement Project is nearly completed. Last Sunday, workers removed the cross-over valve between the old and new fire water loops and placed TA-55 buildings entirely on the new loop. This eliminates the possibility of some accident scenarios involving a rupture of the old loop impairing the new loop. Seismic upgrades on the two pump houses and associated tanks are also complete. Remaining work primarily involves removing old components, grouting the old loop in place, and backfilling trenches.

Decommissioning Activities: The Omega West beryllium reflector was successfully removed from the reactor in one piece earlier this month and is scheduled to be shipped to TA-54 in mid-March (site rep weekly 12/27/02). While radiation levels were 3 to 5 times higher than expected (i.e., 5,000 R/hr), the highest individual exposure was 40 mrem – an indicator of a well-executed activity. Workers this past weekend were removing other reactor internals, and again found radiation levels about 5 times higher than expected (about 3 R/hr). They proceeded with the job, and collectively received a dose higher than originally expected. Two workers may have received doses of about a Rem each. Generally, Omega West decommissioning activities have gone well, but the level of radiological protection supervision and the work suspension limits (i.e., when to stop and reassess) may warrant review.

Authorization Basis (AB): The NNSA Site Office has rejected the TA-54 (Area G) AB upgrade package, submitted by LANL on January 10th. The primary issues appear to be level of completeness and adequacy of addressing previous NNSA comments. NNSA and LANL have concluded that the current TA-55 AB complies with the nuclear safety management rule (10 CFR 830) and have postponed action on that update. In the last week, LANL submitted the packages for the TA-50 Radioactive Liquid Waste Treatment Facility and for the TA-50 Waste Characterization, Reduction, and Repackaging Facility (WCRR). Currently, a high-quality upgrade for TA-54 appears to be the limiting step for LANL reaching the milestone of having submitted compliant ABs by April 2003.

Radiation Protection: Last week, the NNSA Site Office formally raised questions on an apparent low level of objective evidence supporting a LANL triennial assessment of occupational radiation protection. NNSA informally requested supporting documentation in November and December and is pursuing this in order to validate the LANL assessment process and results.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 7, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 7, 2003

Facility Operations and Maintenance: LANL completed transition this week to the new support services contractor, KSL (site rep weekly 8/9/02). The site rep has met the KSL senior management. They bring fresh perspective on facility maintenance practices and appear dedicated to worker safety.

Radiochemistry Laboratory (TA-48): NNSA has directed LANL to operate TA-48 using the safety basis approved last August, subject to two conditions: only operations necessary to reduce the radioactive inventory to below Hazard Category 3 (HC-3) levels are permitted in the Alpha Wing and the Basement Vault; and normal operations are permitted in other areas provided the inventory is below HC-3 levels. TA-48 is receiving help in strengthening the inventory control program from the new LANL Operations Support Group, OSG (site rep weekly 11/15/02). The OSG is thinly manned but making a difference here and in other facilities at LANL.

Critical Experiments Facility (TA-18): This week, LANL restarted the Solution High Energy Burst Assembly (SHEBA), which has been down since August 2000 due to a flammable gas generation question (site rep weeklies 5/10/02, 9/13/02). SHEBA is operating under Technical Safety Requirements (TSRs) approved last summer and verified to be in place by a LANL readiness assessment last November. The TSRs include two limiting conditions of operation that control flammable gas. One is an integrated power limit (i.e., total fissions in one day). The other requires the nitrogen cover gas system to have a specified flow, based on daily measurements. The accident analysis indicates that the power limit is sufficient to prevent conditions conducive to a detonation or deflagration. The TSRs also require periodically verifying that cover gas flow is sufficient to limit oxygen and hydrogen gas concentrations to less than 1 % by volume.

Design Criteria: Last week, NNSA directed LANL to prepare a corrective action plan for addressing issues identified in a crosswalk of LANL engineering processes to DOE criteria on explosive and nonreactor nuclear facility safety (DOE G 420.1-1). The focus is mainly on improving institution requirements for construction project management, including requirements for systems engineering, fire hazard analyses, defense-in-depth, and software quality assurance.

Decommissioning Activities: LANL and the Omega West Reactor D&D subcontractor have agreed to stricter hold-point and communication controls as a result of the event 2 weeks ago when work proceeded after radiation levels were found that were greater than expected (site rep weekly 1/24/03). This job involved removing interlaced graphite bricks in a confined area that had radiation levels up to 20 R/hr. Based on review of the event with LANL and the subcontractor, it does not appear that a less man-rem intensive approach would have worked that didn't generate other challenging hazards (e.g., profuse airborne graphite dust with activation products). LANL is receiving advanced notice of planned radiological work, hold points, and projected doses. Hold points and reevaluation occur now when an activity's radiological conditions exceed those expected by 20% or more. Within a few days, the subcontractor expects to complete removal of reactor internals and begin biological shield removal and radioactive waste shipments. The latter will continue until mid-March when the Be reflector will be shipped to TA-54. Decommissioning is expected to be done this summer. Overall, the project appears to be well-managed and to be using appropriate radiological controls.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 14, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 14, 2003

Facility Operations: LANL is proceeding with facility management realignment and consolidation under a site-wide Justification for Continued Operation, JCO (site rep weekly 11/29/02). The goal is that this unified organization would identify, plan, and implement needed improvements while minimally impacting nuclear facility operations. This effort appears well-motivated and is intended to address real institutional needs. The JCO expires in April and may require attention to ensure it is adequately closed out by that time.

LANL has stated that roles and responsibilities during this transition would remain consistent with current, specific AB requirements. The site rep has observed that several key personnel in facility operations (e.g., from TA-55, CMR) are being transferred to other LANL areas that need assistance. While this addresses institutional needs, less-experienced personnel may now be called upon to recognize and respond to emergent conditions in these facilities. This aspect is worth considering in the timing and selection of these transfers. Longer term, LANL management appears to recognize the needs for improvements in succession planning, training, and mentoring of operations personnel.

Authorization Basis (AB): The site rep believes that the NNSA site office and LANL can achieve the April 10th deadline for AB upgrades here, but it is going to be tight. It depends on quality of LANL analysis and documentation and ability of NNSA to spot issues and provide feedback early.

Last week, LANL resubmitted the TA-54 (Area G) AB upgrade package, which was revised to address NNSA comments (site rep weekly 1/24/03). This week, NNSA sent back the Radiography Facility (TA-8-23) AB package, which LANL submitted last September. The Radiography Facility is in an older building (1940s era). It was added to the nuclear facility list in 2000 and has been operating to a JCO. The building lacks seismic, confinement, and engineered fire suppression features and is heated by a natural gas fired boiler. This facility radiographs high explosive and nuclear components, including sealed heat sources containing Pu-238 oxide. NNSA raised several issues involving the conservatism in natural gas deflagration calculations and the completeness of analyses and of the proposed controls, particularly for the heat sources.

Longer term, NNSA and LANL are beginning to plan for how to maintain and continuously improve the ABs. The site rep believes that the annual update process here previously has been ineffective and thereby contributed to past AB violations, AB near-misses, and AB-operations interface issues. LANL appears to be moving toward an improved, resource-loaded annual update process.

Waste Management: The TA-54 Radioassay and Nondestructive Testing facility (RANT) is key to the Quick-to-WIPP risk reduction program, since it is used to load WIPP shipping containers (site rep weekly 12/6/02). RANT is approved to operate as a Hazard Category 2 (HC-2) under a limited Basis for Interim Operation (BIO) that expires on June 1, 2003. DOE is conducting a readiness assessment (RA) next week to verify implementation of this limited BIO. The site rep understands that the full BIO has slipped to late April, leaving about 1 month for its review, approval, implementation, and verification (i.e., RAs). Timing appears problematic and worthy of management attention to ensure an adequate, implemented RANT safety basis while best supporting the Quick-to-WIPP program.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 21, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 21, 2003

Martin, Stevenson (OE), and Von Holle were on site this week observing a LANL design review for a dynamic experiment confinement system.

Plutonium Facility (TA-55): Last Saturday, TA-55 shut down ventilation in a controlled manner for 6 hours due to an emergent need to secure instrument air. This was a planned shutdown. After restoring ventilation and completing confirmatory surveys, the facility resumed normal operations. On Wednesday, TA-55 determined that a large number of weekly fixed head airborne samples were reading high, based on preliminary counts. At this time, there are not any other indications of a significant contamination release (e.g., no continuous airborne alarms after ventilation restored, no elevated airborne monitor readings, no elevated contamination readings from daily radcon surveys, no trend of contamination found on personnel exiting rooms). LANL is investigating this event.

Instrument air reliability and its impact on confinement ventilation is a recurring issue. LANL is replacing the instrument air compressors to improve reliability. As previously discussed, alternatives are available that could improve confinement ventilation reliability, such as using process air or nitrogen as a backup to instrument air (site rep weekly 1/31/03).

Recommendation 2000-2: One Phase II assessment remains to be done at LANL. The site rep understands that the design for the partial site-wide fire alarm system replacement has nearly reached the stage where DOE and LANL anticipate conducting this remaining assessment. Timing is open.

Recommendations 94-1/2000-1: LANL has begun to systematically sort and package unneeded lower-risk residues for disposal at WIPP. This will reduce inventory and handling risks, improving safety, as well as lower costs, permit more efficient storage, and free up vault space, improving LANL's ability to support high-priority national security missions (site rep weekly 5/3/02).

Quality Assurance (QA): While much remains to be done, progress is being made in institutional quality assurance (site rep weekly 10/18/02). In January, NNSA agreed that LANL had resolved earlier comments on the institutional quality management implementation plan. NNSA still has concerns on the current QA reporting structure and is closely monitoring progress. This plan has been in development for awhile and appears to be a starting point. LANL has also completed a current program description, has nearly completed a gap analysis, and is refining planning and cost estimates. There continues to be a pressing need to achieve these improvements. For example, an NNSA facility rep recently reported an ejected connection during a non-radioactive vessel test, due in part to weaknesses in quality assurance.

Backfit Analysis: University of California has suggested that the LLNL backfit analysis methodology be considered here to decide if hardware modifications, procedure changes, or compensatory measures are warranted when a new standard is invoked. LLNL has a formal process that involves establishing an assessment team knowledgeable of a nuclear facility's safety systems, performing a gap analysis and a more detailed alternatives analysis, and submitting recommendations to the responsible Associate Director for approval and to the NNSA Site Office for concurrence. This could lead to improvements in LANL engineering processes and in achieving compliance with DOE criteria on explosive and nonreactor nuclear facility safety (DOE G 420.1-1).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 3, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 28, 2003

The site representative was at DNFSB-Headquarters in Washington, D.C. This report is submitted for continuity purposes only.

cc
Board Members

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 7, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 7, 2003

Facility Operations: LANL has established a Nuclear Safety Executive Board to elevate the details and closure of emergent nuclear safety issues to senior management attention.

Nuclear Materials Management: NNSA and LANL have made progress in nuclear material management. However, a significant inventory of excess material is here or is planned to be shipped here soon that lacks a clear disposition path (Board ltr 5/20/02, site rep weekly 3/8/02).

There are successes. TA-18 has shipped about 0.5 MT of uranium-based materials to Oak Ridge and continues shipments. This includes old CMR material and Omega West Reactor fuel (site rep weekly 8/9/02). CMR has also resumed processing TA-18 excess uranium solutions (SHEBA fuel) and has processed about one-quarter of those solutions. This activity will likely be interrupted to relocate equipment within CMR (site rep weekly 11/22/02). LANL also plans to characterize 34 questionable drums of excess uranium this year and disposition them during the next two years.

There are also problems. LANL excess nuclear materials without a current disposition path include: about 0.5 MT of fuel-grade plutonium (Pu) and Pu contaminated highly enriched uranium (HEU); some non-MOX specification plutonium; about 5,000 transuranic sealed neutron sources; and a small inventory of U-233. The U-233 has been waiting awhile for Oak Ridge containers. The sealed sources are among those being actively recovered from around the US by the Off-Site Source Recovery Project (OSRP). Most of the 5,000 sources already here have been consolidated into about 300 waste drums; however, they currently have no pathway out of LANL, primarily because of programmatic issues involving eligibility for WIPP. The other materials also have no clear pathway, primarily because of programmatic issues affecting multiple DOE sites. These issues involve resource allocation, consistent material definitions and requirements, and coordination between sites (both NNSA and DOE-EM) that have similar excess materials.

Plutonium Facility (TA-55): TA-55 continues to thoroughly investigate the numerous high fixed head airborne samples reported in site rep weekly 2/21/03.

On Saturday 2/22/03, two pipe fitters received a possible inhalation dose, based on positive nasal smears (37 dpm alpha max), and had skin contamination (500 dpm alpha max). This resulted when they opened a leaking steam condensate line for repair with insufficient radiological controls. The workers were in one-pair of anti-c's but without respirators. The work authorization did not require respirators, a Radiological Work Permit (RWP), or assign radcon coverage. During work planning, the assumption was made that no contamination was present – based on no detectable activity in leaked water and no contamination found when the system was last opened, which was more than a year ago. This system is in the PF-4 basement near the ceiling and connected to a lab room. NNSA and LANL recognize it should have been treated as potentially contaminated.

The facility's immediate and supplemental actions appear appropriate. Involved personnel were decontaminated and placed in a diagnostic bioassay program. Facility management has reviewed this event with appropriate personnel and has directed that no intrusive work without an RWP may be performed unless it is specifically approved by facility management. TA-55 is still considering what permanent improvements need to be implemented in this area.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 14, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 14, 2003

The staff held a video conference with NNSA and LANL on Friday on LANL fire protection.

Plutonium Facility (TA-55): TA-55 has nearly completed the investigation of the numerous high fixed head samples reported in site rep weekly 2/21/03. The LANL technical review appears thorough. PF-4 ventilation was secured in a controlled manner for 6 hours on Saturday 2/15/03 due to an emergent need to secure instrument air. While ventilation was secured, the blowers for the fixed head air sampling system continued to operate, providing a motive force. This system discharges into a ventilation recirculation system at a point upstream of the HEPA filters. Idling the recirculation system while running the fixed head air sampling system led to backflow into lab rooms from contaminated ductwork, thus providing the source term. Rooms involved with aqueous operations tended to have the higher samples, which is expected. These operations produce easily distributed, fine particle oxides that are now present in the ducts from legacy events. Improvements to prevent recurrence are still being considered. One worthwhile improvement would be to increase instrument air reliability – including a possible backup – and thereby minimize the need for securing confinement ventilation.

Nuclear Materials: LANL has recently identified several unrelated cases of unknown or poorly characterized nuclear materials including: 8 drums containing either tritium (5), plutonium (1), or hazardous chemicals (2) in TA-41; 2 casks with unknown contents in TA-48; 26 unknown samples and one Cm-244 sample in a cooler in a trailer in TA-59. Additionally, the site rep understands there are several drums of problematic legacy tritium material from TA-33 stored in WETF, some poorly characterized containers in CMR, and the 34 drums in TA-18 discussed last week.

Some of these materials have caused problems. For example, the TA-33 material was the source of an unanticipated room and stack release of tritium from WETF in January 2001. The TA-59 samples provided the source term for an event two weeks ago when a LANL employee's badge became contaminated (120,000 dpm alpha) and contamination was taken off-site. Subsequently, elevated contamination levels were found in the van in which the employee was working. Results so far indicate no health consequences, but this appears fortuitous. Material control and radcon practices for this operation appear weak. In all these cases once identified, LANL appears to have put in place appropriate interim controls for the current configuration. Disposition planning may need more attention in an integrated sense at the institutional level. Longer term, a more disciplined, comprehensive effort may be needed to find, characterize, track, and then timely disposition such materials.

Recommendation 2000-2: NNSA and LANL have finalized a corrective action plan to address fire protection system issues identified last year as part of the Recommendation 2000-2 Phase II assessments (site rep weekly 9/6/02). Some of these corrective actions rely on institutional improvements anticipated during the next 2 years, such as implementation of LANL maintenance and engineering program manuals and procedures to standardize facility operations. This is part of the Facility Revitalization Project. The remaining LANL Phase II assessment will be focused on the site-wide fire alarm system and is scheduled to begin next month. It assumes completion of the partial system upgrade. Preliminary design of the partial system upgrade is essentially complete, but project baselining and start of detailed design are slipping until July due to a change to a design-bid-build acquisition strategy.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 21, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 21, 2003

Leary (OE), Rosen, and Tontodonato were here this week reviewing nuclear material stabilization.

Recommendations 94-1/00-1: Since 1995, LANL has stabilized about 59 % of its 94-1 excess and programmatic inventory and achieved significant risk reduction. About 4,850 items remain to be stabilized and packaged or disposed as waste (site rep weekly 5/3/02). During the last 2 years, LANL has developed and nearly finalized a comprehensive, resource-loaded plan to stabilize the remaining items by late 2010, based on level out-year funding with escalation (about \$11M per yr). The staff has not seen details of this plan, which is expected to be complete in a couple of months; however, it appears that LANL is already executing to it and making better progress on both repackaging programmatic material and stabilizing and/or discarding excess material. Progress is also apparent in development of a STD-3013 outer can welder and in design of equipment for large vessel clean-out. The latter is to be installed in the Chemistry and Metallurgical Research Building (CMR), Wing 9.

There may also be opportunities for acceleration. Some higher-risk materials, based on isotopic content, will not be stabilized until the 2007-2010 period, due to delays in equipment design, installation, and startup for the high exposure line. This line's glovebox shells are already in place. The delay appears mainly due to priorities assigned last year to meet the level out-year budget. LANL intends to work some of these materials in the existing lines as the opportunity arises, such as before the TA-55 annual inventory and line clean-out each December. LANL has also begun to systematically sort and package the lower-risk residues for disposal at WIPP. LANL should be in a better position to improve processes and accelerate the schedule after gaining more experience in both direct discard of lower-risk items and use of existing lines to address the higher-risk materials.

Integrated Safety Management: Close attention continues to be warranted on personnel following safety requirements (i.e., formality of operations), on adequate work planning to meet requirements, and on improving on-floor supervision with emphasis on safety requirements when appropriate (site rep weeklies 10/18/02, 11/15/02, 1/10/03). Institutionally, LANL has taken positive steps at the group level to improve supervision. The site rep also understands that the LANL team reviewing safe work practices institutionally has identified needed improvements in requirements, but that most of the benefit is likely to come from better implementation. This may apply not only to programmatic work, but also facility, maintenance, and construction activities. Facility work is controlled through a different process than that being reviewed by the LANL team but may benefit from the same recommendations. Much could be gained by a few well-planned initiatives to ensure personnel understand and comply with safety requirements, including maybe simplifying some requirements to achieve this end. The staff is planning a review week after next of LANL work planning, performance, and feedback that will examine this area.

Nuclear Materials Management: More attention may be warranted to characterizing the 34 questionable drums of excess uranium in TA-18, as well as processing TA-18's excess uranium solutions (SHEBA fuel). Plans exist but appear to need better coordination. The operation to convert the excess uranium solutions to salt is being displaced from CMR Wing 9 to make room for the large vessel clean out operation discussed above. Currently, it appears it will be restarted in a couple of months in Wing 5 at limited throughput and then moved to Wing 3 toward the end of the fiscal year. In the last week, LANL has identified resources that should help keep this on track.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 28, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 28, 2003

Authorization Basis (AB): As of this week, NNSA considers that 13 out of the 18 LANL nuclear facilities have AB's compliant with the Nuclear Safety Management rule (10 CFR 830). NNSA has provided formal comments to LANL on proposed ABs for the remaining five. Of these, the site rep believes that the AB for TA-54 (Area G) appears to face the most challenges. NNSA considers the current TA-55 AB to be compliant and will finish review of a major revision to it after April 10th.

Plutonium Facility (TA-55): PF-4 had an unanticipated one-minute loss of ventilation yesterday, interrupting operations for about an hour. It appears that a construction worker may have inadvertently secured cooling water to one of the new instrument air compressors. The compressor self-monitors cooling water pressure and shut down. It is unclear why the backup compressor did not start up. There were no radiological consequences from this event.

Decommissioning Activities: The beryllium reflector from Omega West Reactor was shipped to TA-54 this week and placed in an underground shaft. Transportation and disposal went smoothly and were completed within the 24 hour period specified in the AB. This shipment removes the principal remaining source term from Omega West – specifically, the activation products bound within the reflector and associated framework. The reflector had contact radiation levels up to 5,000 R/hr when it was removed from the reactor in January (site rep weekly 1/24/03).

Nuclear Materials: Site rep weekly 2/14/03 discussed 8 poorly characterized drums in TA-41 containing either tritium (5), plutonium (1), or hazardous chemicals (2). TA-41 is located in Los Alamos Canyon. This week, LANL shipped the drum thought to contain the highest inventory to a facility where it can be safely dispositioned (LANL estimate: 14,000 curies tritium). LANL has adequate controls in place for the remaining drums. Plans for their disposition continue.

Radiochemistry Laboratory (TA-48): While progress is being made, TA-48 faces challenges operating within its Hazard Category 3 authorization basis (site rep weekly 2/7/03). Earlier this month, TA-48 received an irradiated target shipment before notifying NNSA and before allowing NNSA to complete a required inventory verification. Also, last Wednesday, a natural gas valve was left open near the hot cells, leading to a facility evacuation. Because of the hazard, the natural gas system is considered safety-significant in the AB, but formal operating procedures and controls are lacking. The facility first recognize the AB implications of this event late this week.

Weapons Engineering Tritium Facility (WETF): The WETF safety strategy is highly dependent on the tritium storage containers, considered Safety Class. Last April, NNSA required WETF to place 65% of its inventory in improved containers by April 2003. NNSA and LANL still have not reached closure on use of improved tritium storage containers with higher temperature rated seals.

Timing also remains open for the DOE Operations Readiness Review (ORR) covering Building 450 startup and new AB implementation (site rep weekly 12/20/02). The site rep understands that the LANL ORR report is also still not finalized, nearly 4 months after that ORR. The issues are well known, and LANL appears to have a reasonable plan to implement the AB and prepare for the ORR.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 4, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. Keilers
SUBJECT: Los Alamos Report for Week Ending April 4, 2003

Keilers was off site this week. Anderson, Burnfield, Jordan, Volgenau (OE), and Von Holle were on site reviewing safety aspects of work planning and work performance.

Plutonium Facility (TA-55): The TA-55 authorization basis (AB) considers the fire suppression system to be safety significant because it protects workers and provides defense in depth for safety class systems. However, there are long-standing questions on the adequacy of flow to hydraulically remote sprinkler heads in PF-4 (site rep weeklies 11/2/01, 12/7/01, 12/23/01). LANL has asserted previously that the original design requirements were not based on actual risk factors, such as combustible content. These design requirements are included in the current AB. In December 2001, NNSA agreed with LANL that this condition did not constitute an imminent safety concern. Further action was postponed to allow key personnel to focus on site-wide AB upgrades during the last year in order to comply with the Nuclear Safety Management rule (10 CFR 830). The AB upgrades are now nearly complete.

Recently, LANL informed the staff that 40 of the approximately 970 PF-4 sprinkler heads would not deliver the minimum flow density specified in both the original design and the AB (i.e., NFPA-13, Ordinary Hazard Group II), and 10 of these would not meet a less stringent standard typically specified for chemical laboratories (Ordinary Hazard Group I). The site rep understands that the affected sprinkler heads are spread among several laboratory rooms and tend to be a small fraction (e.g., 10 %) in any particular room. LANL appears now to be considering facility modifications to address this condition. Since these issues have been long-standing and involve the AB, it appears that timely progress toward closure would be appropriate.

Lighting Protection: NNSA approved last month a LANL corrective action plan that is intended to address lightning protection issues raised in a Board letter dated August 6, 2002. Since last September, NNSA and LANL have improved the formality of issue transmittal, tracking, and closure on these and other lightning protection issues identified during the last 2 years (site rep weekly 9/20/02).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 11, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 11, 2003

On Friday, the site rep attended a meeting in Albuquerque on lab support for Pantex operations.

Integrated Safety Management (ISM): Last Friday (4/4/03), an employee was burned in a non-nuclear facility when a thermoplastic and aluminum compound he was removing from a petri-dish flash-ignited within an open hood. LANL is investigating. There may be parallels between this event and the chlorine dioxide explosion last year (site rep weeklies 1/11/02, 10/25/02). If so, this could indicate continued weaknesses in work controls for programmatic activities – particularly, in the LANL system of safe work practices. Institutionally, safe work practices are one of the main mechanisms for LANL implementing ISM in both nuclear and non-nuclear facilities. LANL's investigation of last year's event was thorough but institutional followup is still incomplete.

Chemistry and Metallurgical Research Building (CMR): Last Thursday (4/3/03), CMR Wing 5 had a partial ventilation shutdown, possibly due to crafts personnel inadvertently bumping a switch. This was a skill-of-craft job. There may be parallels to the TA-55 loss-of-ventilation two weeks ago when a worker inadvertently secured cooling water to a compressor (site rep weekly 3/28/03). In both cases, safety systems were impacted. On the positive side, the CMR operations center saw the ventilation fluctuation and decided to evacuate the wing since the fluctuation was unexpected. LANL systematically investigated the problem on Friday and returned the wing to normal operations.

Radiochemistry Laboratory (TA-48): On March 26th, two people picked up contamination on their clothing while performing elution in the hot cells. It appears the contamination resulted when pump lines were removed. Since this is similar to an event earlier this year, TA-48 has stopped this activity until it can be investigated and proper controls can be implemented. This is positive.

On March 19th, TA-48 had a natural gas leak near the hot cells due to a valve left open, detected by smell; however, the facility did not enter its emergency procedures and did not evacuate (correction to site rep weekly 3/28/03). The facility believes that an unsafe condition was a potential but did not actually exist – because the leak was isolated within 30-35 minutes after detection and, if gas were uniformly distributed, it would have been more than 18 hours before the space reached the lower explosive limit. This logic appears incorrect because of gradients and potential ignition sources. The event raises questions in addition to those involving the adequacy of procedures and controls for the natural gas system, considered safety-significant under the TA-48 authorization basis. The contrast to CMR's conservative response to the less hazardous condition discussed above is noteworthy.

Nuclear Material Management: LANL has recently identified several unrelated cases of unknown or poorly characterized nuclear materials (site rep weekly 3/14/02). While acknowledging the positive that these items are being found, NNSA has questioned the process used to identify and track such legacy items. NNSA has asked LANL to report on how these issues are being addressed, whether they constitute an institutional issue, and whether enhanced standards or requirements are needed.

In the TA-48 case, one of the two questionable casks was in a posted radioactive material storage area that is located right next to a shed containing propane bottles, a forklift, and other combustibles. NNSA is pursuing this possible hazard with facility management. The questionable cask has been relocated.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 18, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending Apr 18, 2003

Quirk was here this week reviewing TA-18 instrumentation & control and software quality assurance.

Authorization Basis (AB): LANL met the April 10th deadline to submit AB upgrades, per the Nuclear Safety Management rule (10 CFR 830). NNSA is currently reviewing the proposed upgrades for waste operations (TA-50, TA-54), radiography (TA-8-23), and facility management realignment (site-wide). Nuclear facilities continue to operate under previous ABs during the NNSA review.

Preliminary Notice of Violation (PNOV): Last Thursday, NNSA sent LANL a PNOV for several nuclear safety issues that arose last year. Specific events involve the following facilities (refer to site rep weekly of date in parenthesis for details): the Critical Experiments Facility (1/11/02, 2/15/02), Plutonium Facility (3/15/02), Radiochemistry Laboratory (8/9/02), and non-nuclear radiography facility (10/18/02). NNSA also identified examples where LANL processes for identifying causes and correcting quality problems were not effective - a longstanding institutional issue. Based on the longstanding nature, NNSA considered escalating the severity level of the quality improvement findings; however, NNSA decided against this because of significant commitments LANL has made to strengthen senior management and implement site-wide improvements to quality processes. While it's in the early stages, the site rep has seen progress in this area.

Critical Experiments Facility (TA-18): Last July, DOE approved a new TA-18 AB that includes 11 newly designated Safety Class systems – intended to address about 100 hazard scenarios that challenge the evaluation guidelines (site rep weekly 9/13/02). Among these systems are the existing scram chains and the new in-core temperature monitoring systems. The latter are in design now. They are intended to provide a signal to the existing scram chains and thereby prevent fuel and irradiated samples from melting and partially vaporizing during a rapid, uncontrolled reactivity insertion while in delayed critical mode. Such an event hypothetically leads to TA-18's highest consequence accident, unless prevented by a scram. LANL has compensatory measures in place until the monitoring systems are installed (e.g., sample size limits, reduced neutron flux trip set points).

There appear to be significant engineering challenges to developing a temperature-based scram system that is capable of measuring peak temperature during a fast transient; has adequate response time; has justified trip set points; meets standard Safety Class requirements (e.g., separation); and can be shown, via combined analysis and test, to satisfy the AB functional requirements. While the design is being competently executed, neither the new in-core system, as currently envisioned, nor the existing scram system appear to fully meet standard Safety Class requirements. The shortfalls warrant justification. An independent design review, perhaps by the LANL Reactor Safety Committee, may be helpful at identifying improvements (TA-18 agreed). To address some challenges, TA-18 is having to develop engineering procedures that are currently not specified fully at the institutional level, such as: Safety Class guidance, back-fit guidance, commercial item dedication, and independent design reviews.

Weapons Engineering Tritium Facility (WETF): On Tuesday, WETF had a tritium release into a glovebox and from there into a process room. The room was evacuated, operations were secured, and the tritium (about 0.7 Ci) was exhausted to the environment via an approved stack. Health consequences were minimal (2 mrem to the effected worker). LANL has appropriately investigated this event and identified potential weaknesses that need to be reviewed and corrected.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 25, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 25, 2003

Radiochemistry Laboratory (TA-48): NNSA has agreed with LANL that TA-48 can operate under the approved Hazard Category 3 safety basis with specific constraints until May 15th or until NNSA has verified the inventory (site rep weekly 2/7/03). Two pertinent questions now involve the facility's residual inventory (i.e., holdup) and the adequacy of the facility's inventory control practices. Pending resolution, LANL would like to downgrade TA-48 to a radiological facility; however, both the path forward to address the above questions and the details of whatever is to replace the current safety basis appear open at this time. While, it may be possible to downgrade TA-48, the remaining worker hazards are significant enough to warrant LANL and NNSA attention.

Dual Axis Radiographic Hydrodynamic Test Facility (DAHRT): LANL is celebrating its 60th anniversary, and ceremonies this week included dedication of DAHRT. DAHRT consists of two flash x-ray machines at right angles to a high explosive firing site. It can be used to capture time-resolved stereo images of weapon component mockups at the moment of implosion. The first axis began operation in Fall 2000 and has been used for 6 major experiments. In March, NNSA approved closeout of the construction phase, which includes the second axis. LANL expects to complete second axis commissioning in late 2004. DOE and LANL have categorized DARHT as a moderate hazard non-nuclear facility that may occasionally be required to perform a nuclear activity.

Plutonium Facility (TA-55): This week, LANL submitted documentation to NNSA to demonstrate that TA-55 has manufactured a nuclear weapons pit, QUAL-1, using fully qualified processes. NNSA is reviewing the package. If accepted, this culminates a 6 year LANL-wide effort to restore the nation's ability to manufacture certifiable pits that meet all quality requirements. The last such pit was made at Rocky Flats 14 years ago. Since February 1998, LANL has made 18 pits in the development leading up to QUAL-1. LANL now plans to make about 6 pits per year to support certification efforts and plans to develop capability to make about 10 stockpile pits a year by 2007.

Radiography Facility (TA-8-23): NNSA has agreed with LANL that TA-8-23 can operate under its current Justification for Continued Operation (JCO) until September 2nd or until NNSA approves the new safety basis proposed by LANL to comply with 10 CFR 830. TA-8-23 is a Hazard Category 2 nuclear facility. It is more than 50 years old, is heated by natural gas, and lacks seismic, confinement, and engineered fire suppression features. TA-8-23 also has radiographic inspection capabilities that are unique at LANL and support national security missions. To address some hazard scenarios, LANL has committed to remove the natural gas from the facility by May 15th and to shutoff the natural gas at the supply valve in the interim. This is positive.

Critical Experiments Facility (TA-18): Similar to TA-8-23, TA-18 also has Hazard Category 2 nuclear operations in buildings heated by natural gas. To address this, the TA-18 safety basis includes automatic gas shutoff valves as controls to prevent a follow-on explosion after a seismic event. The site rep understands that TA-18 is now also considering removing natural gas.

Recommendation 2000-2: The one remaining LANL Phase II assessment will be focused on the site-wide fire alarm system and is scheduled to begin May 12th. It assumes completion of the partial site-wide system upgrade, which is in preliminary design (site rep weekly 3/14/03).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 2, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 2, 2003

LANL Management: DOE has decided to compete the LANL contract, now held by University of California, when it expires in Sep 2005. In testimony, NNSA has stated that the failures at LANL are real but are also the failures of a few, and that the vast majority of LANL personnel continue to perform in an exceptional manner. NNSA also stated that it is difficult to see how any organization could have done more to deal with that problem than the University of California has since Dec 2002.

During this same period, the site rep has seen positive LANL initiatives to improve nuclear safety. This includes establishment of a Nuclear Safety Executive Board to increase senior management visibility to emergent nuclear safety issues, as well as startup of an operational mentoring program to provide guidance and training to LANL management at multiple levels in critical nuclear safety elements, formality of operations, and work control.

Weapons Engineering Tritium Facility (WETF): The WETF safety strategy depends on tritium storage containers, considered to be Safety Class. The safety basis assumes the containers are capable of withstanding 120 C. A year ago, NNSA advised LANL to pursue higher temperature seals on these containers (i.e., 250 C) to increase thermal margin. This was based on DNFSB staff input and lack of any apparent reason not to pursue high temperature seals. Last week, WETF provided NNSA a review on why higher temperature seals should not be mandated for all the containers. WETF stated that these are secondary containers; they have other components (e.g., a pressure gage) that would likely fail at temperatures less than 250 C; and the higher temperature seals are harder to use and have higher leakage incidence than polymer seals. The component temperature limits mentioned are inconsistent with those in a LANL March 2000 container study. NNSA is evaluating this information, as well as LANL progress in increasing the WETF inventory that is in improved containers (e.g., rated at 120 C).

Pantex Support: The site rep attended the Standing Management Team (SMT) meeting at Pantex Thursday to determine the status of laboratory support for Pantex operations. The SMT includes experienced federal, laboratory, and Pantex contractor personnel and has been responsible for defining and managing requirements for integrated safety improvements for Pantex nuclear weapon processes (i.e., SS-21, IWAP). While not always effective in the past, the SMT has emerged as a vehicle for NNSA to manage, leverage, and prioritize multiple-contractor resources and thereby achieve timely resolution of issues and timely implementation of safety improvements.

Under the NNSA re-engineering, it appears that NNSA is now on a path to reduce the federal role in the SMT and to reduce the SMT's integration function. This may be problematic for several reasons: (1) Contractors would be expected to determine and assign priorities among themselves within the bounds of their own contracts. This could result in each contractor firmly advocating a course that most efficiently meets his own contract; however, that course may not be most efficient for the overall NNSA complex or in the best interest of timely implementation of safety improvements. (2) It's unlikely federal management could evaluate and referee such situations on a timely basis without continuous active technical engagement by federal staff. Lack of such engagement could slow down timely implementation of safety improvements. (3) The SMT has added visibility to emergent issues on individual projects and appropriately asked if they apply to other projects. Reduced emphasis on integration would likely reduce pressure for individual projects to benefit from such lessons learned.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 9, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 9, 2003

Integrated Safety Management: LANL management is reviewing recent recommendations by a LANL team for potential improvements in institutional safe work practices (site rep weeklies 10/25/02, 3/21/03). Safe work practices are the formal mechanism that LANL uses to implement ISM into programmatic (i.e., non-facility) work.

Decommissioning Activities: In January, LANL reported that environmental sites here contain radionuclide inventories that have not been categorized per the Nuclear Safety Management Rule (10 CFR 830). LANL proposed categorizing and controlling inactive waste sites as less than Hazard Category 3 (HC-3) using methodology approved last September by DOE-EM for EM sites. Last week, the NNSA Site Office non-concurred with the LANL proposal.

This week, LANL informed NNSA that the two TA-21 General's Tanks may contain a kg of plutonium requiring categorization as HC-2 but that they are not a hazard now in their present buried configuration. These tanks were used between 1945 and the mid-1970s as liquid radioactive waste receiver tanks. They have been inactive for two decades and need to be characterized (site rep weeklies 9/20/02, 10/11/02). LANL is preparing a safety analysis for characterization activities.

Waste Operations: TA-54 is a HC-2 nuclear facility used for solid waste operations, including storing and shipping transuranic (TRU) waste to WIPP. It is currently storing about 20,000 TRU waste drum-equivalents in fabric dome storage, containing more than 0.1 MCi Pu-239 equivalent. Nearly two-thirds of this inventory is in 2,000 higher wattage drums that, last year, DOE and LANL committed to having off-site by the end of FY 04. This is the Quick-to-WIPP initiative. Progress so far has been slow – only 15 of these drums have shipped since December.

The TA-54 Radioassay and Nondestructive Testing facility (RANT) is key to the Quick-to-WIPP initiative, since it is used to load shipping containers for WIPP. NNSA has extended from June 1 to September 4 the authorization for RANT to operate as a HC-2 under a Limited Life Basis for Interim Operation (site rep weekly 2/14/03).

Last month, LANL submitted the TA-54 updated safety basis, to comply with 10 CFR 830. The analyses of the postulated accident scenarios predict high consequences for extremely low probability events, primarily because they postulate that the highest source term drums are collocated and participate in the accident. Based on the analysis, LANL proposes that TRU waste containers, container banding, domes, and dome door restraints as safety class and the lightning protection system as safety significant. LANL also proposes technical safety requirements including inventory limits (in total and by dome) intended to control and distribute the inventory. This may be an area requiring more rigor. Meanwhile, more attention on accelerating the Quick-to-WIPP initiative appears appropriate.

Chemistry and Metallurgy Research Building Replacement (CMRR) Project: The draft environmental impact statement (EIS) was distributed this week. The Notice of Availability will be published in the Federal Register next week. The comment period runs to June 30. The Final EIS and a Record of Decision are scheduled for Nov 2003 and Jan 2004, respectively.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 16, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
J. J. McConnell, Deputy Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 16, 2003

The site representatives were at DNFSB-Headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 23, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 23, 2003

Work Controls: Last Monday, LANL reported that 9 people received small tritium uptakes (up to 8.3 mrem) when cutting and removing copper piping in the Ion Beam Facility (TA-3-16) and that this was an activity outside the scope of the skill-of-craft work package used to authorize the job.

The Ion Beam Facility is an excess, shutdown facility awaiting disposition. The authorized work included general upkeep and removing loose items for salvage. The workers were removing piping to get to a shield wall. Their intent was to remove part of the wall and thereby gain forklift access to salvage a large pedestal magnet. The room had been downgraded to radiologically uncontrolled status, although tritium contamination had been found in other similar systems in the building and other equipment in the room. During post-job surveys, radcon personnel found tritium contamination inside the pipes – identifying the hazard after the work. LANL management has stopped this job, directed a stand-down of such surveillance and maintenance activities at LANL excess facilities, and is reviewing surveillance and maintenance work requests for similar problems. LANL is also performing a causal analysis of this and similar events to ensure common factors are identified and institutional improvements are pursued.

Plutonium Facility (TA-55): TA-55 reported a Technical Safety Requirement (TSR) violation this week because un-calibrated differential pressure gauges are being used to confirm that HEPA filters are unplugged. TA-55 has a TSR to periodically confirm that differential pressure across filter plenums are within specification. The TSR surveillance procedure requires verifying gauge calibration. The NNSA facility reps recently observed daily rounds and determined that the gauges are not calibrated. LANL previously recognized this condition for about 68 gauges and has been planning to correct it. On Tuesday, NNSA approved continued operation with the un-calibrated gauges. LANL plans to replace the gauges with calibrated ones by June 30th.

On Tuesday, TA-55 had a low-level personnel contamination event when replacement heater elements were moved from one room to another via an introduction hood, glovebox lines, and the trolley system. The source remains to be determined. Seven glove box gloves in two different rooms had contamination but were apparently intact. LANL lines of inquiry include: self-survey requirements during glovebox work within a single line, between lines, and between rooms; worker compliance with these requirements; and the practicality of avoiding skin contact to anti-Cs at the conclusion of work.

The NNSA Site Office has assigned priority to complete by June 1st its review of the process hazard analysis (PrHA) for the new Pu-238 scrap recovery line (site rep weekly 1/17/03). LANL has stated that a need exists for about 9 kg of clean Pu-238 by Sep 04 and that LANL has 1 kg from running the bench-scale unit (a high man-rem activity) and maybe another kg from other sources. LANL has indicated that meeting this schedule requires near-term PrHA approval, Jul-Aug readiness assessments, Sep-Oct startup, and then “sprint mode” operation (i.e., 8 kg/yr rate) for at least part of the remaining period.

Radiochemistry Laboratory (TA-48): The NNSA Site Office has extended LANL authorization to operate TA-48 under the approved Hazard Category 3 safety basis until today (site rep weekly 4/25/03).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 30, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 30, 2003

Nichols, Martin, and Von Holle were on site this week reviewing LANL processes for developing weapons response data, which are vital inputs to Pantex safety analyses.

Plutonium Facility (TA-55): On Tuesday, LANL submitted to NNSA a revised process hazard analysis (PrHA) for the Pu-238 scrap recovery line. Changes were made to incorporate recent NNSA informal comments. On Thursday, NNSA approved with comments the revised PrHA. NNSA and LANL will have a schedule for readiness assessments and startup in about a week.

Substantive changes from the LANL January submittal are: (1) one of the five analyzed accidents had higher consequences (ball mill jar ejection), and the predicted dissolver deflagration energy increased; (2) the dissolver pot is safety significant; and (3) explicit proposed Technical Safety Requirements (TSRs) were withdrawn, although there are descriptions of what is considered to be TSR-level controls.

NNSA and LANL assert that public safety is assured by the existing building structure and confinement, and glovebox seismic integrity (i.e., safety class). They also assert that worker safety is assured by new features: unique ion exchange (IX) resin type, IX rupture disk, ball mill containers, ball mill steel lid and latch (i.e., safety significant). There are also new administrative controls: glovebox Pu-238 and combustible inventory limits, monthly IX liquid level inspection, resin replacement requirements (dose, dryness, age), and dissolver argon flow and pre-op test requirements. The ball mill lid interlock, IX exterior steel mesh, and IX auto-elution system are defense-in-depth.

Recommendation 2000-2: NNSA has completed the Phase II assessment of the site wide fire alarm system, including the partial system upgrade currently in design. This is the last Phase II assessment at LANL. The report is imminent. The assessment team observed that the system has about 22,000 alarm points and 250 fire control panels of numerous brands. About 80% of the panels need to be replaced or modified to resolve major signal delay issues (site rep weekly 1/17/03). The team made several suggestions including standardizing on one or two panel designs, as well as considering an additional project to upgrade 75-100 buildings not in the current project. Fewer panel designs should simplify maintenance and reduce life-cycle costs, since it reduces requirements for training, vendor services, and spare parts. LANL needs on-site expertise in these systems since fire alarm vendor support in many cases is 100 miles away.

The team also observed that many facilities are not scheduling fire system maintenance on time, resulting in only part of the required maintenance being accomplished. NNSA and LANL recognize that this is unsatisfactory. Improving maintenance priorities and efficiency is one of the main drivers for the LANL facility management realignment now underway (site rep weekly 2/14/03).

Radiochemistry Laboratory (TA-48): NNSA has downgraded TA-48 from Hazard Category 3 to a moderate hazard radiological facility, based on a LANL analysis, an NNSA facility walk-down, and a LANL demonstration of inventory controls. TA-48 is also in the process of restarting two facility areas that had higher inventories earlier in the year (site rep weeklies 1/31/03, 4/25/03).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 6, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 6, 2003

Broderick, Gwal, Jordan, and White were here reviewing electrical and lightning protection systems.

Weapons Engineering Tritium Facility (WETF): During the next 2-3 months, WETF intends to transition to its new authorization basis (AB), which was approved in April 2002. The new AB mandates several systems as safety class – intended to protect the public. These include tritium storage containers and the NFPA 780 lightning protection system. Questions have lingered for more than a year on the adequacy of these systems to perform safety class functions: such as, the high temperature sealing requirements for the tritium storage containers and the level of operability required for the lightning protection system (site rep weeklies 4/26/02, 5/31/02, 11/15/02, Board letter 8/6/02). In March, a lightning protection consultant to LANL reported on the system and concluded that it is unlikely to prevent arcing in areas used for tritium handling and storage (i.e., fulfill its safety class function), but that the containers themselves are robust to lightning effects. Given that WETF is operating now and in transition to the new AB, it appears worthwhile for NNSA and LANL to assign high priority to quickly addressing these issues.

Lightning Protection Systems: NNSA and LANL are increasingly relying on NFPA 780 lightning protection systems as safety-related engineered controls for nuclear facilities. This may be inappropriate, particularly for safety class systems. Besides WETF, the new Critical Experiments Facility (TA-18) AB specifies an NFPA 780 system as safety class, and the proposed TA-54 waste operations AB would specify an NFPA 780 system as safety significant. A Board letter last August and a DOE headquarters on-site review last September questioned the appropriateness of depending on NFPA-780 systems for nuclear facility controls (site rep weekly 9/20/02). These appear to be examples where more in-depth design/backfit review is warranted to ensure each engineered control will perform its designated safety function and that practical operability requirements are defined.

Plutonium Facility (TA-55): On Tuesday, TA-55 reported a high fixed head air sample reading (53 DAC-hrs weekly sample) in a room that was subsequently found to have a small nearby area of removable contamination. LANL is investigating what work was recently performed in this room.

Also on Tuesday, a worker opened a container of Pu-238 via a glovebox glove and then discovered contamination on one of his surgeon's gloves. RadCon personnel responded. After personnel surveys, the room was evacuated and controlled. Subsequent investigation identified a relatively new glove with a tear (installed in April). Two local fixed head air samples were elevated (max: 472 DAC-hrs daily sample), but there were no skin contaminations, and nasal swipes were negative. The 5 affected personnel are being placed on diagnostic bioassay. The site rep observes that there was a similar Pu-238 glove tear in January (site rep weekly 1/17/03). It may be appropriate to confirm that sufficient controls are in place to prevent glove-tears, particularly for Pu-238 operations.

Chemistry and Metallurgical Research Building (CMR): The CMR AB specifies that ventilation is safety significant because it protects the public and worker from releases from spills and moderate fires (along with safety class fire suppression). However, the electrical power needed to run ventilation is general service and doesn't have a diesel generator backup. Functional classification of electric power, as well as emergency lighting to facilitate evacuation, may warrant reconsideration.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 13, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 13, 2003

Plutonium Facility (TA-55): On Tuesday, TA-55 reported another failed glovebox glove in the Pu-238 operations (see last week's report). The worker discovered the failed glove while monitoring his surgeon gloved hand after closing an interconnecting spool-piece door between two gloveboxes. Radcon responded and detected in excess of 1M dpm on the worker's left gloved hand. Like last week, the room was evacuated and controlled. Subsequent investigation identified this was an older glove (installed in October 2000). All fixed head samples in the room were elevated. The one at the workstation with the failed glove read 1065 DAC-hrs (daily sample). There were no continuous airborne monitoring alarms, and no skin contaminations. One worker had an elevated nasal smear. The 5 affected workers are being placed in diagnostic bioassay. On Wednesday, the site rep toured the space with LANL and a DOE facility rep. It appears that this glove failed by being mechanically pinched. A piece of glove was visible, wedged in the threads of the spool-piece door closure.

Because of repeated glove failures, TA-55 has started an investigation to determine if there are any common causes between the Pu-238 related failures. This appears necessary but insufficient. LANL recognizes that the gloves are the weakest link in the safety-significant glovebox confinement system. LANL thoroughly investigates each failure, and periodically has pursued means to reduce failures. The site rep believes LANL could be well-served by implementing a continuous improvement effort for glovebox gloves and glovebox operations to minimize these failures. Areas to consider may include engineering, quality assurance, and operator training. Several DOE sites rely on glovebox operations, likely have similar issues, and could all benefit from active sharing of lessons learned.

Radiochemistry Laboratory (TA-48): Two weeks ago, NNSA downgraded TA-48 to a radiological facility (site rep weekly 5/30/03). On Thursday, TA-48 reported that their inventory exceeded the radiological facility limit. This resulted from a data entry error in the material control database for a Pu-238 sample. TA-48 has frozen material receipts and has suspended its Pu-238 operations. The site rep believes that LANL has better facilities for Pu-238 chemistry than TA-48. Given the tiny amount of Pu-238 a radiological facility can handle before exceeding material-at-risk limits (i.e., max: 36 mg – provided there is no other source term), it isn't clear why these operations should be conducted in TA-48 in its present status as a radiological facility. These activities could be a hold-over from TA-48 operations up to two weeks ago as a Hazard Category 3 nuclear facility.

Chemistry and Metallurgical Research Building Replacement Project (CMRR): On Monday and Tuesday, the site rep attended an NNSA/LANL workshop on the CMRR Project. This project is intended to replace the aging CMR Building and maintain LANL capabilities in actinide analytical chemistry and material characterization, as well as increase LANL secure vault space. It is about midway through the conceptual design phase (roughly, 3% design stage). LANL estimates the cost range is \$420M - \$955M and schedule range is 9 - 14 years. Near-term schedule includes layout selection in September, record of decision next January, and start of preliminary design next March.

Quality Assurance: DOE Office of Assessments (DOE-OA) is conducting a complex-wide review of suspect counterfeit item controls and practices. A DOE-OA team was here this week and completed its field investigative work on NNSA Site Office and LANL practices.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 20, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 20, 2003

Plutonium Facility (TA-55): Last Thursday, two TA-55 workers had skin contamination as a result of a glovebox glove failure in Pu-239 aqueous operations. The workers discovered the contamination when they frisked their hands and feet at the lab room exit. Radcon personnel responded and controlled the room. One worker had a positive nasal smear. One fixed head air sample was elevated (16 DAC-hrs). The two workers were decontaminated and placed on diagnostic bioassay. This is similar to other recent events (site rep weeklies 5/23/03, 6/6/03, 6/13/03).

Because of recent glove failures, TA-55 management curtailed non-essential glovebox work. TA-55 has approximately 7,000 pairs of glovebox gloves and recognizes that they constitute the weakest link in its glovebox confinement system – an engineered control. There is a high reliance on administrative controls, particularly proper frisking at the glovebox after removing hands from the gloves. During the curtailment, the facility is training workers on recent experiences, best glovebox practices, glove inspection; inspecting frequently used gloves (those not requiring step-ladder access); inspecting each glovebox for sources of acute insult to gloves (i.e., pinch points, sharp objects, heat/abrasion sources); and performing a sampling inspection on newer gloves.

Recommendations 94-1/00-1: LANL is making progress in design and procurement of large vessel clean-out equipment for the Chemistry and Metallurgical Research Building (CMR) Wing 9 – a Recommendation 94-1 milestone (site rep weekly 3/21/03). Equipment is now being procured. However, the safety analysis, including preliminary functional classification, is lagging. It is being worked, but programmatic risk (i.e., cost, schedule, scope) is increased until it is satisfactorily shown that the safety analysis and the design are sound and in phase with each other.

Weapons Engineering Tritium Facility (WETF): The WETF safety strategy depends on tritium storage containers, considered to be Safety Class (site rep weeklies 6/6/03, 5/2/03). The safety basis assumes the containers are capable of withstanding 120 C. NNSA has directed LANL to pursue higher temperature container seals (i.e., 250 C) to increase thermal margin; however, new questions are emerging that cast doubt on container high-temperature performance (i.e., above 120 C), such as pressure gage integrity and decreasing container material strength with temperature. It appears prudent to address these questions quickly, given the importance of the containers. A worthwhile objective at this point may be to increase overall thermal margin, if practical, but retain a lower temperature rating for safety analysis that is consistent with current uncertainties in the failure modes.

Authorization Basis (AB): Last Fall, the NNSA Site Office approved the LANL on-site transportation safety document (TSD) and associated Technical Safety Requirements – TSRs (site rep weekly 11/29/02). NNSA prefers that LANL shipments fully comply with Department of Transportation (DOT) requirements. However, in some cases, such packages are not available. The TSD provides a framework for developing controls that ensure overall safety. LANL intends to capture and propose the activity-specific controls in transportation plans for NNSA approval.

Progress on these transportation plans has been slow. They play a key role in specifying the controls that NNSA and LANL are depending on for specific shipments – to the point where they may need to be considered, all or in part, as the TSRs for specific shipments. There is some confusion on this aspect, which may warrant clarification.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 27, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 27, 2003

Anderson, Batherson, Daniels, Hunt, Jordan, and Winters were on site this week reviewing radioactive waste management and decontamination and decommissioning activities. The site rep was off site this week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 3, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 3, 2003

Critical Experiments Facility (TA-18): NNSA has suspended work on the TA-18 mission relocation to the Nevada Test Site because of recent increases in the projected costs to complete the project (site rep weekly 1/3/03). The project has reached the 90 % conceptual design stage (i.e., about 4 % overall design). NNSA has begun several assessments to find the cause of the increases, and plans to complete these assessments and determine a path forward by the end of this month.

Plutonium Facility (TA-55): The LANL and NNSA readiness assessments (RAs) for the Pu-238 scrap recovery line are tentatively scheduled for next week (7/7-11/03) and early August (8/4-8/03), respectively, but this appears optimistic. It's not yet clear to the site rep that the scope for either RA has been fully defined; procedures updated, verified, and validated; personnel trained on the updates; and readiness reviewed by TA-55 management via demonstration. These may be complete or could occur quickly, leading to a declaration of readiness for the LANL RA. The site rep intends to observe portions of the LANL RA when it occurs.

Engineered Controls: As required by 10 CFR 830, LANL has updated LANL nuclear facility authorization bases, including engineered controls. NNSA action on some updates is pending. NNSA and LANL need to apply more attention to ensuring that all the engineered controls selected have clearly defined safety functions, that they will fulfill those functions, and that they constitute a complete set. Some other sites have systematic approaches to engineered controls institutionalized in "Conduct of Engineering" manuals. LANL has a solid effort started to develop a similar approach, but it will take time to implement. Meanwhile, the site rep believes uncertainty exists here on whether some designated engineered controls will fully meet the intent. The staff has identified several examples including: WETF lightning protection and containers, CMR electrical power/ventilation, TA-18 flood retention structure and new temperature scram system, TA-55 fire suppression and Pu-238 safety systems (e.g., site rep weeklies 11/8/02, 12/6/02, 4/4/03, 4/18/03, 6/6/03). To the site rep's knowledge, issues from only one system from this list are resolved or nearly resolved.

Contamination Events: Regarding recent glovebox glove failures, TA-55 completed near-term actions and resumed non-essential glovebox work the week of June 20th (site rep weekly 6/20/03). Longer-term actions continue. Last week, a Pu-238 worker had contamination found and removed from a fingernail. Contamination was then found in two glovebox gloves in use less than a year. In an unrelated event, an airborne release occurred in one room, traced to a glovebox door actuator leak.

Also last week, the Chemistry and Metallurgical Research building (CMR) reported high fixed head air samples for two consecutive weeks in one room in early June (e.g., 67 DAC-hrs, weekly sample). CMR was unable to link these to particular events but did find elevated surface contamination on hood tops and supports (i.e., 20-70 dpm alpha on half the swipes). It appears close management continues to be warranted at CMR to contamination control and tracking fixed head sample results.

Tritium Facilities: NNSA has downgraded the Tritium Systems Test Assembly Facility (TA-21-155) from Hazard Category 2 to a radiological facility, based on less than 0.5 g tritium inventory. This building originally supported the Rover program and, between 1984 and 2000, was used for fusion research. It has been de-inventoried and prepared for surveillance and maintenance mode and later decommissioning. High inventory components have been removed. Remaining components have residual inventory and are vented to the building. Stack effluent averages less than 1 Ci/day released.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 11, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 11, 2003

Stevenson and Von Holle were on site this week reviewing dynamic experimentation.

Pantex Support: The site rep attended the Standing Management Team (SMT) meeting at Pantex on Friday to determine the status of laboratory support for Pantex operations, including LANL support. The SMT is responsible for defining and managing requirements for seamless safety improvements (i.e., SS-21) for Pantex nuclear weapons processes. In June 2002, the SMT approved slipping completion of SS-21 for the W-88 from April 2004 to July 2004, due to scope growth from (a) accelerating bay tooling by 1 year (i.e., to 5/03 – still incomplete) and (b) incorporating a developmental primary assembly process specified by LANL that month. (Pantex site rep weekly 6/28/02).

This week, the W-88 SS-21 project informed the SMT that, because of delays in developing the new primary assembly process (a quality improvement), this safety-enhancement project is not expected to be completed until January 2006. This is a 17 month delay from the SMT approved baseline (7/04) and a 20 month delay from the original schedule (4/04). It is also beyond authorization basis and nuclear explosive safety study exemptions granted by NNSA (7/04 and 9/04, respectively), which will require NNSA to either suspend operations or extend the exemptions. It impacts availability of W-88 surveillance data. Per the project, even if the safety and quality improvements are decoupled now, the safety improvements would still be late – March 2005, an 11 month delay from the original schedule.

Price-Anderson Enforcement Letter: DOE Office of Enforcement (DOE-OE) informed LANL this week of its concern that LANL nuclear safety continues on a negative trend. DOE-OE observed that work control breakdowns that led to the recent Ion Beam Facility contamination resemble those that occurred in a TA-55 event in March 2002, raising questions on effectiveness of corrective actions. Also, the recurring TA-55 airborne releases, due mainly to glovebox glove failures, could indicate quality and work control issues. TA-48 exceeding its inventory limit as a radiological facility was also a flagged concern. DOE-OE took no action now because of LANL senior management commitment and because improvements being made will take time to be effective. They did state that escalated enforcement would be considered if non-compliances to the nuclear safety rule (10 CFR 830) occur at LANL (site rep weeklies 3/15/02, 4/18/03, 5/23/03, 6/13/03, 6/20/03 discuss the events above).

Plutonium Facility (TA-55): The LANL readiness assessment (RA) for the Pu-238 scrap recovery line began Monday. LANL expects it to conclude next week. Nearly all the procedures were updated between last Tuesday and Thursday (7/1-3/03), and management declared readiness. The RA team is the same as last July, and is using the same plan of action and implementation plan. This week, the team reviewed documents (e.g., closure of previous findings), walked down the line, and observed comminution and dissolution. These were demonstrated by the subject matter experts (PhDs) who are training the crew and who will supervise the operation after startup. Currently, the RA team does not consider the other operations significantly different than those observed last year, and does not plan to have those demonstrated again. In effect, this RA is a continuation of the RA of a year ago, focusing on the corrective actions from the last RA and on the subsequent changes due to the updated process hazard analysis, as identified informally by the individual team members within their areas of responsibility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 18, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 18, 2003

Shuffler was on site this week providing site rep assistance and observed plutonium and tritium processing, analytical chemistry, critical assemblies inspection, and solid/liquid waste operations.

Plutonium Facility (TA-55): The NNSA readiness assessment (RA) for the new Pu-238 scrap recovery line is scheduled to begin the week of August 4th. The LANL RA is in the report writing phase. The team expects to conduct a management out-brief and issue their report on or about July 29th. LANL considers that there has been only one RA – the one starting last week, and that last July's RA was never completed. While preliminary findings have not been disseminated, LANL seems confident that they will be ready for the NNSA RA the week of August 4th.

Waste Operations: DOE and LANL progress on the Quick-to-WIPP initiative is slow but improving – 51 of the 2,000 drums in this inventory have been shipped this FY, along with about 830 other drums. DOE and LANL expect to accelerate the pace. LANL was making about one WIPP shipment per week in March, went to two per week in May, and expects to go to three per week next month. For comparison, LANL only made two WIPP shipments in FY 02. Quick-to-WIPP shipments take longer to prepare, because of a shipping container evacuate and backfill requirement. Off-gassing can extend the process. They are also not full shipments, because of shipping certificate limits. However, the target 2,000 drums (8 % of the accessible inventory by number) warrant priority because they contain about two-thirds of the accessible source term. This is a significant risk reduction.

Weapons Engineering Tritium Facility (WETF): NNSA and LANL are assigning higher priority to addressing thermal-margin questions on WETF tritium storage containers, considered to be Safety Class. It remains to be seen whether overall thermal margin can be increased above that assumed in safety analyses by simply replacing the gaskets. The site rep believes lightning protection questions also need to be addressed to support new TSR implementation (site rep weeklies 6/6/03, 6/20/03).

WETF has been verifying and validating new surveillance procedures, required to implement the new TSRs approved in April 2002. Last month, WETF proposed TSR changes to address issues raised during the November 2002 LANL Operational Readiness Review (ORR) and in more recent LANL reviews. The changes were intended to address the potential for different interpretations. WETF proceeded at risk and incorporated these changes into surveillance procedures. Based on NNSA/LANL feedback, WETF resubmitted the TSR changes this week, focused just on TSR implementation, and is currently revising procedures again. The site rep believes that this appears to be a case where expectations between operations and safety basis management (both NNSA and LANL) have not been clearly set, agreed upon, and communicated. The net result is likely delay in full implementation of enhanced safety controls in the new TSRs – effectively delaying nuclear safety improvements.

Chemistry and Metallurgical Research Building (CMR): CMR reported this week a Technical Safety Requirement (TSR) violation from personnel not tracking all special nuclear material items within the material-at-risk (MAR) inventory system, a safety basis control. Personnel recognized an accumulation of small items that were each sub-accountable under the material control and accountability system, a safeguards control, and were not being tracked as MAR. CMR is rectifying the situation, including inventorying sub-accountable items. MAR limits were not exceeded.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 25, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 25, 2003

Integrated Safety Management (ISM): The site rep has observed increased management attention, leading to improvements in the investigation, trending, and reporting of safety issues by LANL, including nuclear safety issues. Examples include increased use of causal analysis; increased reporting of events in nuclear facilities under Price Anderson; and thorough investigations into two accidents that occurred in April in non-nuclear facilities (i.e., chemical flash-burn to a researcher, multiple compound fracture to a D&D subcontractor). The lessons learned identified by LANL, even those originating in non-nuclear facilities, are significant and have implications to nuclear operations.

To elaborate on one example, the LANL audits and assessments office recently reviewed conduct of operations in 7 LANL divisions. The team focused on procedures for higher risk work; interviewed management and workers; reviewed records, procedures, hazard control plans; and observed work being performed. The team reported that expectations for procedure development and use had not been clearly established; step-by-step procedures were not always followed; some procedural work was not being done with proper tools and/or personnel protective equipment; procedures were not always accurate, complete, current, and user-friendly; and equipment was not always properly maintained.

This was a solid review. LANL intends to address these findings as part of implementation of the DOE conduct of operations order, added to the contract in 2001. LANL is currently revising its conduct of operations implementation plan to take advantage of operations advisors recently assigned to key LANL managers. The Advisor Program was a commitment by the LANL Director during a Price Anderson enforcement conference (site rep weekly 4/18/03). This LANL initiative recognizes the need here to improve ISM processes in a manner that changes the culture and that will endure. This effort has the potential to increase emphasis on personnel following safety requirements, on adequate work planning to meet requirements, and on improving supervision with emphasis on safety requirements when appropriate – all areas warranting attention (site rep weekly 3/21/03).

Plutonium Facility (TA-55): LANL has proposed to slip the NNSA readiness assessment (RA) for the new Pu-238 scrap recovery line two weeks (i.e., to 8/18) to provide margin in addressing the LANL RA team's pre-start findings. The NNSA RA team will be here next Tuesday, tour the line, and attend the LANL RA team briefing to management. The LANL RA report should be ready then.

Weapons Engineering Tritium Facility (WETF): WETF will miss a July 25th milestone for Technical Safety Requirement (TSR) implementation. The site rep understands that WETF is curtailing programmatic work in order to focus on TSR implementation.

Authorization Basis (AB): NNSA has several proposed AB upgrades in for action including for the Plutonium Facility (TA-55, since April 2002), liquid & solid waste operations (TA-50, TA-54), TRU waste shipping container packaging (TA-54 RANT facility), and nuclear radiography (TA-8-23). Implementation of several approved ABs is also not going smoothly, particularly WETF and on-site transportation. LANL recently issued an institutional procedure for annual updates to ABs, but the schedules are undefined. A resource-loaded and effective annual update process could help minimize AB violations, AB near-misses, and AB-operations interface issues seen in the past.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 1, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 1, 2003

Radiochemistry Laboratory (TA-48): TA-48 is a radiological facility, recently downgraded from Hazard Category 3. On Wednesday, a researcher had a small amount of acid solution jet onto his face and drip into his eyes (amount released estimated to be on the order of a milliliter). He was wearing prescription safety glasses at the time. The researcher had just pressured a small ion exchange column by using a syringe attached to a rubber stopper at the top of the column. Apparently, the rubber stopper was not fully seated, allowing the solution to spray. Facility management considers the work being performed to be routine and the equipment used to be fairly standard for a radiochemistry lab.

Immediate and supplemental actions were prompt and appropriate, and included extensive eye flushing and medical attention. No permanent eye damage is expected. The responsible LANL division has committed to a review of the event for lessons learned, as well as a review of their work activities and whether appropriate eye protection is specified. LANL senior management also intends to conduct an investigation. The NNSA Site Office has observed that this event has similarities to some other recent events (e.g., site rep weekly 4/11/03). This work was planned, controlled, and authorized under the LANL safe work practices, which is the LANL mechanism for implementing integrated safety management (ISM) into programmatic work for both nuclear and non-nuclear facilities.

Plutonium Facility (TA-55): NNSA is evaluating the impact of the Board's letter of today on the Pu-238 scrap recovery line and on the upcoming NNSA readiness assessment (RA). The site rep understands that NNSA is now planning on starting the RA after briefing the Board on August 21st. LANL has not yet declared readiness, although was planning on the NNSA RA starting that week.

The LANL RA report is nearly complete. It is based on team observations made last month and a year ago (7/02). It remains to be seen that the cumulative scope of the LANL RA completely covered the new authorization basis approved in May 2003. Preliminarily, the LANL review has about 30 pre-start and 20 post-start findings, of which about half were reported as complete on Tuesday. LANL recognizes that there are lessons learned from this RA that can improve the LANL RA process.

Weapons Engineering Tritium Facility (WETF): WETF has proactively ceased programmatic work and placed the facility in warm standby so that personnel can focus on implementing the technical safety requirements (TSRs) initially approved in April 2002. NNSA modified the TSRs on July 17th. The objectives now are, by November 2003, achieve TSR implementation and be ready for an NNSA operational readiness review (ORR) for Building 450 startup.

Recommendations 94-1/00-1: On Tuesday, the NNSA Site Office Manager concurred in a LANL project execution plan that describes the scope, cost, and schedule for substantially completing 94-1 nuclear material stabilization activities at LANL by end of CY 2010 (site rep weekly 3/21/03). The plan now goes to NNSA headquarters for final review and approval. It is a living document and includes provisions for periodic progress reporting and for formal change control. It is the culmination of two years of work and is an improvement in resource-loaded planning here necessary to complete 94-1 nuclear material stabilization activities. It could be a roadmap to eventual success if it is approved and then consistently funded and managed and fully executed through the out-years.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 8, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 8, 2003

Jordan, March, and Shields were on site this week to review LANL fire protection. Also, the site rep was at Pantex on Thursday to determine the status of laboratory support for Pantex operations.

Plutonium Facility (TA-55): On Tuesday, a continuous air monitor alarmed in a Pu-238 waste storage and management room while two workers were inventorying containers. The two workers evacuated and were found to have high facial, hair, and skin contamination and high nasal swipes (2,500 dpm max - nasal swipes). They were decontaminated, taken to LANL medical, and released. Initial dose assessments are expected in 2 weeks.

The affected room is sealed. LANL has suspended Pu-238 operations and is working on a recovery plan. The NNSA Site Office has begun a Type B investigation. The team arrives next week. The DOE Order 225.1A *Accident Investigations* criteria for a Type B include a single personnel exposure resulting in total effective dose equivalent between 10 and 25 Rem. LANL is fully cooperating.

During the critique on Wednesday, LANL personnel indicated the following. The containers have Pu-238 residues and waste (e.g., cheesecloth) that are to undergo pyrolysis. These containers are a can-bag-can configuration. The cans are of the slip-lid type and taped. The inner can and the plastic bag have filtered vents. Some containers have been there for years. After a while, some containers exhibit degradation – rust. Efforts were made in December 2002 and in March 2003 to pull out visibly rusted containers. The containers handled on Tuesday had no unusual visible characteristics.

The site rep has the following observations. While the cause of this event is unknown, the containers are suspect. LANL has made slow progress on Recommendation 94-1 nuclear material stabilization for several years. Progress improved in 2003. The 94-1 activities are intended to improve safe storage and expedite residue disposition. One key improvement TA-55 has made is development and widespread use of the TA-55 standard can design, basically screw-top cans with lid filters. The TA-55 standard cans have been available since about 1998 and provide a more robust packaging system than that described above. It is unclear why Pu-238 operations would continue to store their residues and wastes for years in a storage system that visibly degrades and is not the most robust system available – particularly since these materials are possibly the most hazardous radioactive materials in TA-55, at least by isotopics. After room stabilization, investigation, and recovery, expedited safe disposition of these materials may warrant high priority, regardless of whether they are the direct cause of this event.

Weapons Engineering Tritium Facility (WETF): On Thursday, WETF declared a positive unreviewed safety question determination on the temperature rating for standard tritium secondary storage containers, designated Safety Class. The safety basis assumes the containers are capable of withstanding 120 C. NNSA has directed LANL to pursue higher temperature container seals (i.e., 250 C) to increase thermal margin; however, questions have persisted for months on performance above 120 C (e.g., site rep weeklies 5/2/03, 6/20/03). LANL now believes the container aluminum body would fail at 165 C. The site rep observes that similar longstanding questions exist on function of the WETF lightning protection system, designated Safety Class (site rep weekly 6/6/03). Resolution of the container and lightning protection questions may affect previous conclusions on safety basis engineered controls, as well as what constitutes appropriate technical safety requirements (TSRs).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 15, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 15, 2003

On Thursday, the staff held a video-teleconference with LANL, the NNSA Site Office, and DOE headquarters on the Board's issues with the Pu-238 scrap recovery line hazard analysis and controls.

Integrated Safety Management: More attention is needed on workers following safety requirements (i.e., formality of operations), on adequate work planning to meet requirements, and on improving on-floor supervision with emphasis on safety requirements when appropriate, as further illustrated by this week's events. In the Plutonium Facility (TA-55), 3 workers were exposed to a mist that caused a slight burning sensation and difficult breathing. They were attempting to clear an obstruction in a non-radioactive line by using compressed air. Upon investigation, TA-55 management identified issues in defining work, identifying hazards, mitigating hazards, and following the work package as written. They are following up. In the Radiochemistry Lab (TA-48), the evolution that resulted in the "acid-to-the-eyes" event 2 weeks ago was restarted this week then suspended when a worker received a skin contamination. TA-48 management has suspended work done under the affected hazard control plan. Besides work control, this event raises questions on formal restart of a suspended activity and compensatory measures applied until a formal investigation of the previous event is complete. The site rep understands that this week's event will be incorporated into the LANL investigation underway.

Plutonium Facility (TA-55): On Wednesday, the NNSA Type B investigation began on last week's Pu-238 contamination event. The team appears well-qualified and is from multiple DOE sites, including the Savannah River Site (non-NNSA). The team leader anticipates completing the investigation on or around October 3rd. A new question that emerged this week is why the continuous air monitor alarmed in an adjacent room that doesn't appear to be directly connected to the affected room. Last week, this alarm was attributed to radon. The affected room is also adjacent to another room that contains the new Pu-238 scrap recovery line. NNSA intends to wait until after the in-facility investigation work is completed and analyzed before authorizing the start of the NNSA readiness assessment (RA) for the new line. As of Wednesday, the LANL RA report had not yet been finalized.

Authorization Basis (AB): Better institutional criteria are needed here and need to be consistently applied for functional classification, evaluating worker hazards, and designating AB controls. Engineered features are designated as "safety significant" (SS) when a hazard analysis determines they are of particular importance to defense in depth or worker safety. An administrative control may warrant SS designation if an engineered control is impractical. This designation of controls is part of the functional classification process described in DOE-STD-3009. In April 2002, DOE revised this standard so that functional classification as SS would be considered not only for prompt worker fatality and serious injury but also significant worker radiological or chemical exposure.

This week, when discussing a significant worker hazard scenario, LANL indicated that the criteria for SS used in one major facility is a calculated accident dose of 5 Rem to the maximal exposed off-site individual and thereby concluded an SS-level control to protect workers was unwarranted. While this covers the defense in depth aspect, the worker safety aspect specified in the DOE standard was apparently missing, particularly for significant radiological or chemical exposure to workers. This and previous observations raise questions of whether LANL has adequate criteria that are being consistently applied (e.g., site rep weekly 7/3/03). This has implications on recent evaluations, such as the Pu-238 scrap recovery line analysis and the new ABs prepared as 10 CFR 830 updates.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 22, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 22, 2003

The site rep was in Albuquerque NM and in Washington D.C. this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 29, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 29, 2003

Plutonium Facility (TA-55): The NNSA Type B investigation on the 8/5/03 Pu-238 contamination event continues. The suspect containers have been relocated to a glovebox line and planning for non-destructive examination is underway. The moveable cage holding the containers in the affected room has been restored to comply with authorization basis seismic requirements (i.e., cage is closed and chained to the wall). The cause of this event and the initial dose estimates for the workers are still to be determined. The containers remain the primary suspects.

Last Monday (8/18/03), one crafts worker had positive nasal smears after contamination was found in the torso area of his anti-Cs, and the worker has been put on prompt bioassay. The worker had been engaged in dismantling equipment in a Pu-239 glovebox and was using leather gloves over the glovebox gloves while cutting, a best practice. Upon investigation, contamination (400k dpm alpha, 1k - 4k dpm removable) was found on the small window between the gloves. The glovebox gloves are intact. Air monitor indications were elevated but not to a level that would set off an alarm. The site rep understands that the pathway for the release from the glovebox remains undetermined. Speculation centers on the window gasket, which has been taped over with metal tape.

On Wednesday, the NNSA Site Office issued a clarification and amendment to the Pu-238 scrap recovery line technical safety requirements (TSRs). Some key aspects are:

- NNSA named the dissolver argon flush system, the dissolution vessel vent interlock, and the oxalate filtrate storage vessels as safety-significant. NNSA believes that both the dissolution vessel and these storage vessels would be capable of withstanding a hydrogen deflagration. Fill-vent line valves for these storage vessels have also been removed for defense-in-depth.

The site rep observes that, per the LANL PrHA, the oxalate filtrate storage vessels are larger, made of different material, and in a different glovebox than the dissolution filtrate storage vessels. The NNSA letter includes a LANL structural analysis of the latter as an attachment.

- NNSA imposed specific ion exchange resin replacement requirements, including a lower dose limit (now 500 Mrads) to be based on total Pu residence time calculated before and after each run. The dose limit may be reevaluated later as process operational experience matures. NNSA considers these to be do-not-exceed TSR limits.
- NNSA stated that there shall be a proceduralized surveillance on ion exchange column liquid level, including a daily check to detect leakage before initiating glovebox operations.
- NNSA required LANL to define hazard scenarios and critical process steps that require 2-person verification, such as those required to prevent a nitric acid - HAN reaction. When submitted and if acceptable, NNSA intends to approve this list as part of the safety basis.

NNSA also asked LANL to complete an unreviewed safety question determination on thermal vs material-at-risk limits for this operation and to provide an analysis of the safety impacts of alternatives (e.g., 2-shift operation) and a comparison of the relative merits of the scrap recovery line vice more production emphasis on the bench scale process.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 5, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending September 5, 2003

On Thursday, the staff held a video-teleconference with LANL and NNSA on LANL fire protection.

Integrated Safety Management (ISM): Work control is a significant issue at LANL for both facility and programmatic work. On Tuesday, as part of a non-nuclear decommissioning, subcontractor personnel not in appropriate protective equipment cut two locks and accessed an energized 13.2 kV electrical cabinet that they had been incorrectly told was deenergized. While there were no injuries, the potential for arcing and severe injury existed. The site rep also understands that the LANL Electrical Safety Committee has raised concerns with other recent electrical safety near-misses.

Recent LANL investigations indicate that the work control issues are not just limited to facility work, as described above. The needs to complete previously identified corrective actions and, in the short-term, focus on implementation of current safety requirements are clear – i.e., workers understanding and following safety requirements (i.e., formality of operations), adequate work planning to meet requirements, and improving supervision with emphasis on safety requirements. LANL is working on short-term improvements to current requirements, hazard analysis tools, and work control processes.

Longer term, LANL has begun an initiative to integrate work management practices for both facility and programmatic maintenance. The objective is one process for work control, including analyzing hazards and planning and doing work safely and securely. Several internal and external studies during the last 2 years, including LANL accident investigation reports, have identified the need for such integration, and not just for maintenance. Even so, this could be a big step forward when implemented.

Weapons Engineering Tritium Facility (WETF): Last month, WETF curtailed programmatic work to focus on technical safety requirement (TSR) implementation, to be verified by a LANL readiness assessment (RA) at the end of September. NNSA is closely monitoring progress. On Thursday, NNSA approved a reduced inventory limit and a schedule for shifting about 25 % and 50 % of the inventory to more robust containers (at least 165 C fire rated) during the next 4 months and next year, respectively.

On the safety class lightning protection system questions, LANL committed in early 2002 to perform an engineering study on the potential effects of lightning on WETF. In March 2003, a lightning protection expert hired by LANL reported that the WETF system cannot be expected to prevent arcing in tritium storage and handling areas – in other words, it would not fulfill the safety class function. On August 19th, the Board sent NNSA a letter on this. The site rep understands that NNSA and LANL now plan to bring in a different lightning protection expert and have him assess the system. While providing different and beneficial perspective, this appears unlikely to resolve the issues.

Plutonium Facility (TA-55): The NNSA Type B investigation on the 8/5/03 event systematically continues. Initial dose assessments span a wide range but are consistent with those warranting a Type B investigation. Radiography of one suspect container indicates material is outside the inner can.

Decommissioning Activities: The Omega West Reactor site now resembles a dirt parking lot. Only some confirmatory surveys and site restoration (e.g., storm water drainage) remained, as of early August. LANL has reported that the 2-year decommissioning project is 2 ½ months ahead of schedule and under budget. This was a radiologically complex project that was well executed (site rep weeklies 2/7/03, 3/28/03). Omega West Reactor was used for nuclear research between 1956 and 1992.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 12, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending September 12, 2003

Integrated Safety Management (ISM): As a result of recent events, the LANL Director on Tuesday bluntly explained to LANL personnel and contractors his expectations and standards on safety, security, and compliance. These include continuously improving safety, demonstrated senior management involvement in all aspects of safety, a culture that does not accept poor safety practices, and workers that will not gloss over safety problems. He listed common causes of recent accidents - poor hazard identification; lack of focus on procedures; failure to manage work changes; failure to stop work when necessary; overall lack of accountability; failure to extrapolate lessons learned across all LANL organizations; poor management of subcontractor work; lack of formality "when it counts"; and not looking after one another's safety.

LANL is planning training and a series of mentored management walk-arounds during the next 3 months to pursue this initiative. LANL is also initiating Division-level self-assessments to determine whether hazard control plans are current and approved and required training has been completed. The site rep views these as a positive start and responsive to events such as those reported last week.

Plutonium Facility (TA-55): The NNSA Type B investigation continues. LANL resumed Pu-238 operations on or around August 13th but, on Thursday, curtailed Pu-238 operations that generate residues and waste. LANL took this action based on issues that the NNSA accident investigation (AI) team identified that day with the residue/waste storage containers being used (i.e., the slip-lid cans).

On Monday, AI team and LANL personnel entered the affected room. The AI team noted that 2 of the 4 movable cages are not restrained in a manner that would meet Authorization Basis (AB) seismic requirements. One had a single restraint. The other was unrestrained. LANL restrained the cages, but questions remain on whether the restraints would withstand the evaluation basis earthquake. The Technical Safety Requirements (TSRs) list the cages as a design feature but are silent on the seismic requirement and do not require inspections. The Dec 1996 NNSA AB approval letter imposes the seismic requirement. Furthermore, it states that, until the cages are upgraded, LANL is required to put degraded containers in racks that are seismically qualified. The reference to degradation is puzzling.

Based on this, the NNSA facility reps and TA-55 management have identified that several design features in the current AB (1996) and subsequent NNSA approval letters do not have adequate flowdown into the TSRs. TA-55 is pursuing this issue. NNSA approved the AB in 1996, approved TSR rev 1 in 1999, and has modified the AB in various approval letters. LANL submitted an AB revision in Apr 2002 and several months later resubmitted the TSRs. The needs are clear and longstanding for a TSR revision that is complete, effective, and user-friendly and for a complete and verified implementation (e.g., site rep weekly 8/23/02, 10/25/02, 1/3/03). Several other Board questions (e.g., passive ventilation) also are suppose to be addressed by this next TA-55 AB revision.

Weapons Engineering Tritium Facility (WETF): The site rep understands that personnel recently observed lightning above WETF and, near simultaneously, a blue glow or flash in a WETF processing room. No injuries or damage occurred. Roof air terminals, part of the NFPA 780 lightning protection system, were also not damaged. This may indicate that, if there was a strike, it bypassed the Safety Class lightning protection system and found entry into the building. This alternate path to ground would be consistent with that described by a lightning protection expert in Apr 2003. NNSA owes the Board a response to its questions on the effectiveness of this system as a Safety Class control.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 19, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending September 19, 2003

Weapons Engineering Tritium Facility (WETF): WETF is proceeding systematically and appears to be on track for full Technical Safety Requirement (TSR) implementation in November.

Radioactive Liquid Waste Operations: On Wednesday, the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) discovered a leak at a weld in the receipt and storage tank for TA-55 transuranic (TRU) caustic waste – the highest activity waste stream entering this facility. About 300 gal of waste leaked into secondary confinement, which is equipped with an automatic sump pump. There was no environmental release. Tank level appears to coincide with the leak site and is at about two-thirds tank capacity (2500 gal). TA-55 has secured discharges going to this tank.

The site rep understands that waste neutralization, transfer, and receipt procedures are under review. The tank is about two decades old. A thorough tank integrity inspection and an operations and maintenance review appear to be warranted. An extended period without caustic waste receipt capacity could lead to a liquid waste backlog in TA-55 and mission impacts. The RLWTF is an aging facility being considered for replacement (site rep weekly 10/11/02).

Radioactive Solid Waste Operations: DOE and LANL have committed to shipping about 2,000 drums of higher-wattage TRU waste from TA-54 to WIPP by the end of FY04. This effort – referred to as the "Quick-to-WIPP" initiative – will result in a significant risk reduction for TA-54 once it is completed (site rep weeklies 11/1/02, 7/18/02). Progress was slow early this year but is improving. As of Thursday, LANL had shipped 1312 drums to WIPP this fiscal year, including 140 of the higher wattage drums. LANL is currently making about 3 WIPP shipments per week and expects to be making 4 per week by January. Cost per drum has dropped about 4-fold due to efficiency improvements. About 300 of the higher-wattage drums are problematic because they need to be repackaged, requiring close coordination on authorization basis, work planning, and operations. Overall, this risk reduction effort appears poised for success if fully-resourced.

LANL has about 2,400 m³ of TRU waste that is oversized (e.g., gloveboxes) and has been stored in about 300 fiberglass-reinforced wooden crates for years. While the total source-term is lower than the drums discussed above, issues with the integrity of these boxes (one collapsed a few months ago) and with combustible loading make these a concern. Last summer (2002), LANL started up the Decontamination and Volume Reduction System (DVRS) as a radiological facility to begin processing the crates and putting the waste into a form suitable for WIPP. The site rep understands that DVRS operations have been curtailed and that DVRS is unfunded for FY-04. This is unfortunate for two reasons. First, DVRS provides a pathway for addressing the crate integrity and combustible material concerns. Second, DVRS requires manually intensive operations that would benefit from allowing an appropriate learning curve for the workforce – a benefit that could be lost from curtailing operations.

Critical Experiments Facility (TA-18): TA-18 has nearly completed installing the safety class temperature scram systems in SHEBA and Planet and is about to begin testing. In a July 9th letter, the Board raised questions about the ability of these systems to perform their intended function, how their designs are reviewed, and how they will be verified when installed. Per the Board's letter before removing interim controls, NNSA needs to provide a report to the Board that demonstrate that the temperature scram systems will operate reliably and effectively to prevent overheating assemblies. A well-conceived testing program could assist in addressing these issues.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 26, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
J. J. McConnell, Deputy Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 26, 2003

The site representative was at DNFSB-Headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 3, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 3, 2003

Andrews, Bamdad, Deplitch, Fortenberry, and Jordan were on site this week reviewing integrated hazard analyses. Nichols and Von Holle were on site attending the energetic materials conference.

Integrated Safety Management (ISM): On Saturday (9/27), five TA-55 workers reported to the Los Alamos Medical Center after being exposed to vapors while soldering a piping joint for a rerouted coolant line. The coolant (originally freon, later a freon-like substitute) was used for a glovebox machining operation curtailed about a year ago. The workers had just cut the line in two places with a pipe cutter, had observed liquid spraying from the line, and had bagged one end. It appears that the line had not been properly drained and vented prior to the work, that the workers were not informed of the line's status, that the workers were not formally trained on freon, and that the workers did not recognize the liquid as an abnormal condition. Soldering supplied heat that likely caused the coolant to chemically breakdown, producing irritating vapors and an acrid smell. While the workers were adequately protected from radiological hazards (including use of HEPA-filtered respirators), questions exist on whether this chemical hazard was identified, analyzed, and controlled. As a result, all TA-55 facility work was curtailed. Each work package is undergoing review by LANL and KSL prior to re-releasing the work. LANL is initiating an investigation.

Readiness Assessments (RAs): The site rep believes that the LANL RA process needs improvement. The site rep recently received the Management Self Assessment (MSA) report and the LANL RA report for starting up the new TA-55 Pu-238 scrap recovery line, dated 7/6/03 and 7/29/03 respectively (site rep weeklies 7/11/03, 8/1/03). The MSA should have been the most rigorous review in the startup process. The MSA report consists of a checklist, 3 documented management walk-arounds during simulated operations, and no apparent findings. The LANL RA report had 88 findings – 31 require pre-start correction, 20 are post-starts, and 37 are observations. Twelve pre-starts remained open at the time of the RA report. The type and number of RA findings indicate that the MSA was not sufficiently rigorous and that the RA was more a management-assist than appropriate. The LANL RA itself was a continuation of activities of a year ago and was conducted before NNSA approved the startup notification report (9/9/03). While the recent RA activities apparently reviewed all procedures, they did not include demonstration of some operations that had significant changes in safety basis requirements. The site rep believes these types of RA issues are not unique to TA-55. LANL has acknowledged that there are lessons that need to be learned from this to improve the RA process.

WIPP Shipments: LANL has suspended shipments of transuranic (TRU) waste to WIPP as a result of a finding during last week's Carlsbad Field Office annual audit. Specifically, it appears that LANL may have shipped several drums to WIPP without certifiably demonstrating they were greater than 100 nCi/g TRU. While LANL performs non-destructive analysis on the drums, the analysis has not always adequately confirmed that drums were above WIPP's disposal threshold. This suspension delays shipment of higher wattage drums under the Quick-to-WIPP initiative.

Weapons Engineering Tritium Facility (WETF): NNSA has verified that WETF has properly prepared, trained, and demonstrated 4 of 8 new surveillance procedures required to implement the new technical safety requirements (TSRs). WETF is planning a contractor RA in mid-November on the full implementation and on closure of open items for Building 450 startup (site rep weekly 8/1/03). The NNSA Operational Readiness Review for Building 450 startup is scheduled for January 2004.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 10, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending October 10, 2003

The site rep was off site this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 10, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending October 10, 2003

The site rep was off site this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 24, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending October 24, 2003

Blackman and Stevenson were on site this week participating in a dynamic experiments design review.

Authorization Basis: The TA-55 safety basis needs updating. Safety basis updates are expected to be proposed and approved once per year, but this has not occurred for LANL nuclear facilities. The current TA-55 safety analysis report and technical safety requirements (TSRs) were approved in 1996 and 1999, respectively. NNSA has yet to act on an update proposed by LANL in April 2002. NNSA has made resolution of several issues raised by the Board and its staff over several years contingent on this update (e.g., continued acceptability of the passive ventilation mode, adequacy of fire suppression in hydraulically remote locations). Recently, NNSA informed the staff that action would be taken before year's end. However, the update proposed in April 2002 itself now likely needs updating.

This delay may impact safety. Example - the controls proposed in the April 2002 update may not reflect the latest DOE requirements on worker safety (DOE STD-3009, CN 2, also dated April 2002). Example - the current TSRs do not specify periodic in-service inspection of design features to ensure they perform their safety function (site rep weekly 9/12/03). Example - a set of experiments to characterize long term performance of 3013 containers in support of Board Recommendation 94-1 has been waiting safety basis approval for about 10 months. Example - a 3 year delay has occurred in resuming robotic calorimetry after upgrades (1998-2000). The delay appears due in part to lack of closure on safety basis issues. TA-55 has a large inventory that needs to be periodically assayed via calorimetry to meet safeguard requirements. During this hiatus, these assays have been performed manually, increasing worker dose and ergonomic and handling risks. Last Friday, NNSA approved page changes to the 1999 TSRs that (a) reflect the as-built robotic calorimetry room fire rating is not as high as previously approved (1 vs 2 hr) and (b) compensate by reducing the transient combustible load limit, an administrative control. While an engineered control is preferred, this is a positive step. There are likely other examples. Overall, expedited reevaluation of the TA-55 safety basis is warranted.

Solid Waste Operations: On October 2nd, NNSA disapproved the proposed safety basis update for the TA-50 Waste Characterization, Reduction, and Repackaging Facility (WCRRF) because of comments on natural phenomena hazards (seismic, wind), natural gas hazard, fire protection, ventilation, and TSR operability. NNSA requested that LANL submit a corrective action plan within 30 days that addresses the issues. WCRRF is primarily used for visual examination and repackaging activities to support transuranic shipments to WIPP, a high priority for TA-54 risk reduction. LANL has stated that WCRRF has limited remaining service life (i.e., 5 years). It may be worthwhile to promptly consider interim controls that ensure safe operation while the benefits of upgrades are studied. Long-term site-wide risk reduction may warrant accepting a short-term increased risk from WCRRF operation with well-justified interim controls. Expediting alternatives to WCRRF (i.e., modular units) may also be worthwhile.

Liquid Waste Operations: LANL has proposed and NNSA appears poised to approve a path forward on the leaking caustic waste receipt tank in the TA-50 Radioactive Liquid Waste Treatment Facility (site rep weekly 9/19/03). The leak site is at the 42 % level. The short-term plan is to resume operations by transferring receipts from TA-55 through the TA-50 leaking receipt tank directly to the processing system (i.e., the neutralization tank). Transfers are expected to occur weekly and have a maximum volume of about 76 gal, including flush water (equivalent to about 7 % of tank volume if it were held up in the tank). The tank is within a concrete vault that would contain any release. LANL plans to replace the tank and associated piping during the next 6 to 12 months.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 31, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 31, 2003

Hadjian, B. Jones, Jordan, and Rizzo (OE) were on site reviewing bases for seismic and flood hazard analyses and their application to the CMR replacement facility and TA-18 flood retention structure.

Integrated Safety Management (ISM): Next Monday (11/3), LANL begins implementing a single work management approach that addresses common safety issues identified in recent assessments and accident investigations (site rep weekly 10/17/03). This is an interim action until longer-term improvements can be implemented, expected next May. LANL provided a detailed orientation on the approach to about 1,000 people this week. The need for interim action was driven by a recognition that work at LANL is generally performed safely and consistent with industry standards, but a significant injury or near-miss has occurred on average every 6 weeks during the last 6 to 8 months (e.g., site rep weeklies 10/18/02, 4/11/03, 8/15/03, 9/5/03, 10/3/03). Thorough LANL investigations of these events identified common safety issues. NNSA oversight and involvement was pivotal in the scope and timing of the action. While success is not assured, the site rep believes that these are the most positive actions that have taken place here to improve worker safety during the last two years.

Weapons Engineering Tritium Facility (WETF): This week, WETF completed ahead of schedule the implementation of 8 new technical safety requirement (TSR) surveillance procedures, required by the safety basis approved in April 2002. To support implementation, NNSA this week approved TSR page changes to clarify the control room halon fire suppression requirements. LANL curtailed WETF programmatic activities on July 25th so that the facility could focus on TSR implementation. WETF plans to resume programmatic activities in a phased manner under a senior supervisory watch. Overall, implementation has been long in coming. Facility management and personnel, assigned operational advisors, and the NNSA facility rep all played key roles in this accomplishment.

WETF also reported this week that the lightning protection system has undergone repairs to fix all deficiencies and been inspected by LANL for compliance with NFPA-780. An independent inspection is scheduled next week. A Sandia lightning protection expert is also conducting a review of the system for possible improvements. LANL will provide conclusions to NNSA by November 14th.

Chemistry and Metallurgical Research Building (CMR): The CMR TSRs includes a program intended to ensure that material not in active use is placed inside robust safes to protect it during catastrophic events, such as a major fire or earthquake. On October 17th, CMR reported a TSR violation, based on a determination that this program was not properly implemented. Specifically, items within safes were found to not be packaged consistent with that used for surrogate items during qualification tests of the safes in 2000. This issue may not have been recognized for an extended period because (a) the tested package configurations are not clearly documented in the TSRs, CMR procedures, or the qualification report, and (b) there appears to be no standard packaging procedure that is used by the different programmatic groups working in CMR. Since October 17th, CMR has clarified the procedure for using the safes, and inspected and repackaged items as deemed necessary. It appears worthwhile for LANL to consider standardizing packaging as part of both the planned CMR safety basis upgrade (expected in January) and the planned LANL review of confinement pedigree for all TA-55 and CMR plutonium items outside a glovebox environment (site rep weekly 10/17/03).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 7, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 7, 2003

The staff held two tele-conferences with NNSA and LANL this week on the Board's August 19th letter on WETF lightning protection and CMR electrical systems (e.g., power to ventilation).

Lightning Protection: NNSA and LANL are increasingly relying on NFPA 780 lightning protection systems as safety-related engineered controls for nuclear facilities (site rep weekly 6/6/03). The NNSA Site Office asserted this week that the NFPA-780 lightning protection system for the Weapons Engineering Tritium Facility (WETF) needs to be Safety Class and needs improvements to reduce risk. LANL expects an outside expert to report on possible improvements next week. Besides WETF, the Critical Experiments Facility (TA-18) also has an NFPA-780 lightning protection system designated as Safety Class. Per LANL, CASA 1 and 3 NFPA-780 deficiencies have been corrected, and are undergoing inspection. CASA 2 deficiencies require a system overhaul that has been designed. LANL has also proposed designating NFPA-780 systems as Safety Significant in several other nuclear facilities. NNSA and LANL may need to better define institutionally the criteria for operability, maintenance, and configuration management for these systems, based on explicit rationale traceable to the accident analyses, and then demonstrate these systems will fulfill their assigned safety function. This has not yet happened for lightning protection systems.

Chemistry and Metallurgical Research Building (CMR): The CMR replacement facility (CMRR) is in conceptual design. Several key decisions, such as the extent of CMR upgrades and the appropriateness of the current CMR safety basis (a BIO and interim TSRs), have hinged on CMRR being ready in the 2010 time-frame. The site rep understands that CMRR is now not expected to be ready until sometime well after 2010. It may be worthwhile for NNSA and LANL to periodically review previous assumptions and conclusions (e.g., from cost-benefit analyses) in light of CMRR progress and assess the merit of potential improvements versus the continued risk of operating without them. This week, LANL informed the staff it is initiating such a review for the safety basis.

Transportation: This week, LANL suspended on-site shipments of fissile material until emergent questions are resolved on procurement testing of shipping containers. Specifically, the containers (DOT 7A) are required to be capable of withstanding several tests, including a pre-conditioning series of 1-foot drops on each quarter followed by a 1 to 4 foot free drop in a configuration causing the maximum damage (required drop height set by mass). It appears that one source for these containers may not have been conducting the pre-conditioning drops and that, when conducted, tested containers were failing at a lower mass than expected. LANL plans to invoke weight restrictions based on full testing of these containers and then resume on-site fissile shipments in a deliberate manner.

Plutonium Facility (TA-55): One of several questions remaining before startup of the new Pu-238 scrap recovery line is the manner and pedigree of verification of acid concentration during the precipitation process in order to avoid an energetic acid-HAN reaction. LANL asserts that this would be a non-energetic "effervescent" reaction that would not challenge the safety-significant glovebox. LANL bases this conclusion on an experiment (7M acid and 2M HAN) documented in a viewgraph presentation. This appears to the site rep as substandard justification upon which to justify control selection. While NNSA has accepted this, NNSA has also requested and LANL will propose a TSR administrative control – most likely as part of a two-person verification program.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 14, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 14, 2003

On Friday, the site rep attended a meeting in Albuquerque on lab support for Pantex operations.

Integrated Safety Management (ISM): LANL is assigning high priority to implementing an interim work control process intended to improve worker safety (site rep weekly 10/31/03). This is part of a longer term effort to systematically improve and integrate the current programmatic, facility, and sub-contractor work management systems into one system. By Friday, LANL senior management is expected to have identified Responsible Division Leaders for all facilities, assigned delegations, and developed a risk-based schedule for implementing the interim process during the next few months.

Plutonium Facility (TA-55): LANL has prepared and NNSA has agreed to a plan for assessing and recovering the Pu-238 contaminated room that is the subject of the recent NNSA Type B investigation (site rep weekly 8/8/03). The plan has 4 phases: (1) assess radiological conditions and residue inventory; (2) reconfigure residue items and interim storage; (3) decontaminate the room; (4) repack and store residue items until disposition.

The assessment phase (phase 1) is expected to begin next week and involves contamination and radiation surveys, work area decontamination, and assessment of the room's inventory and packaging. Information from this phase will be used in planning and establishing safety controls for the later phases. Room entries are to be made using full-face respirators with appropriate continuous air monitor alarm set-points. During the reconfiguration phase (phase 2), items will be over-packed in plastic filtered bags and placed in either TA-55 standard cans or 55-gal WIPP type filtered drums (min: 6 packages per drum). During the final repackaging (phase 4), most of the inventory will go through pyrolysis to ash and be packaged in a "stainless steel can - plastic bag - TA-55 standard outer can" configuration. LANL is pursuing whether these materials can ultimately be disposed of at WIPP.

Critical Experiments Facility (TA-18): TA-18 has nearly completed installing the Safety Class temperature scram systems in SHEBA and Planet. In a July 9th letter, the Board raised questions about the ability of these systems to perform their intended function, how their designs were reviewed, and how they will be verified when installed. NNSA owes the Board a response prior to LANL removing interim safety controls. NNSA is planning to conduct an independent design review of these systems, patterned after a similar NNSA review done in 2002 on a Sandia reactor control system upgrade. This effort could help resolve some issues and focus those remaining.

Weapons Engineering Tritium Facility (WETF): NNSA owes the Board a rapid response on the functionality of the WETF NFPA 780 lightning protection system, which NNSA has designated Safety Class. This designation resulted from a postulated accident scenario involving lightning-induced failure of multiple tritium storage containers with a fire. This week, the second lightning protection expert issued his report (site rep weekly 9/5/03). While some conclusions differ (e.g., higher flash probability), both experts have concluded that (a) lightning-induced rupture of multiple containers is incredible and (b) the much lower consequence scenario involving burn-through of thin-wall system tubing is the dominant lightning-related risk. For perspective, the system inventory limit is the same as that in a single container, and systems are only loaded to this level about 10 % of the time or less. This scenario's consequences would not normally merit Safety Class controls. NNSA addresses the fire risk via other controls, such as fire suppression, robust containers, and combustible limits. The second expert's report included 11 options to consider if further lightning risk reduction is desired.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 21, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending November 21, 2003

Integrated Safety Management: LANL continues to make progress on implementing interim work control improvements, to be completed by January 1st. This is a difficult, large-scale task that has required many activities to stop work until their work definition, hazard analyses, controls, and authorizations have been updated. To facilitate this effort, the NNSA Site Office and LANL have jointly established six “technical assist” teams that will engage during the next few weeks at the facility or construction project level with four objectives: (1) identify course corrections now; (2) ensure consistent implementation across LANL; (3) provide assistance in the field; and (4) provide feedback for the longer term improvements.

While the site rep agrees this warrants high priority, the site rep is concerned that NNSA has staffed these teams by pulling nearly two-thirds of the NNSA facility reps (FRs) out of their facilities (e.g., CMR, WETF, Waste Operations, DAHRT, Radiography Facility). This is clearly a relative-risk decision. The NNSA Site Office is not staffed for this function. While successfully implementing interim controls will reduce risk, the FRs play a key role in other risk reduction activities. In the past, the FR Program here has been one of the mostly timely and effective mechanisms in bringing safety issues to the attention of NNSA and LANL senior management.

Plutonium Facility (TA-55): This week, TA-55 completed the assessment phase (phase 1) for recovering the Pu-238 contaminated room. TA-55 plans to next begin room decontamination (phase 3) after necessary controls are in place, followed by interim repackaging and storage (phase 2).

Emergency Preparedness: On Wednesday, a local phone company equipment failure degraded off-site and some on-site communications for several hours, including off-site communications to the Emergency Operations Center (EOC). The site rep understands that local 911 service was available but also degraded. Some nuclear facilities rely on 911 service as a compensatory measure for weaknesses in the site-wide fire alarm system (site rep weekly 1/17/03). This week’s event appears worthy of exploring for lessons learned.

Feedback and Improvement: In the last year, LANL has significantly improved both self-reporting and verifiable closure of safety issues in nuclear facilities via the Price Anderson Program. The number of Price Anderson reviews is up for 2003 compared to previous years (14 % more than 2002, 56 % more than 2001). This appears due to better reporting and not to an increase in problems, based on a comparison to other measures (e.g., ORPS). The problems existed before. Now their visibility to NNSA and LANL management has increased. Similarly, the NNSA and LANL closure process for these issues is more rigorous than in the past and under better control by senior management.

Quality Assurance (QA): This week, an NNSA team assessed how well the NNSA Los Alamos Site Office (LASO) has established and implemented key QA program elements and conducts oversight on LANL QA. Based on their preliminary conclusions and on other observations, the site rep believes that LASO is making progress but still lacks a formal, well-defined QA Program. LASO has elements of a program. Areas for improvement might include documents and record management (e.g., both operations and authorization basis approval records); issues management; self-assessments; lessons-learned. LASO is increasing QA staffing and is committed to issuing shortly a quality assurance plan (now draft) and a Functions, Responsibilities, and Authority Manual.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 28, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending November 28, 2003

Waste Operations: LANL is moving forward on a plan to resume WIPP shipments, which LANL suspended in October (site rep weekly 10/3/03). Resuming safe, properly certified shipments is key to DOE and LANL meeting the commitment to ship about 2,000 drums of higher-wattage TRU waste from TA-54 to WIPP by the end of FY04 (currently: 7 % done). The plan involves compliance analyses, retraining, conduct of operations assessments, and management self-assessments for 30 activities – followed by readiness assessments (RAs) for 6 activities. The NNSA Site Office Manager is the startup authority for the final activity, expected to be completed in December.

On November 5th, LANL submitted a corrective action plan for the disapproved safety basis for the TA-50 Waste Characterization, Reduction, and Repackaging Facility (WCRRF - site rep weekly 10/24/03). WCRRF is primarily used for visual examination and repackaging activities to support WIPP shipments. Key elements of the plan are a fire hazard analysis update, seismic upgrade feasibility study, criticality safety update, natural gas removal study, comment resolution meetings with NNSA – all leading up to a resubmitted safety basis in April 2004. In the meantime, LANL is complying with restrictive inventory limits in the current safety basis (i.e., HC-3 inside the building, HC-2 storage outside the building). Success requires close NNSA and LANL management attention.

Engineered Controls: The site rep continues to believe that uncertainty exists on whether some designated engineering controls in LANL nuclear facilities will perform their intended safety function (site rep weekly 7/3/03). There appears to be little site-wide guidance on how to evaluate newly designated safety systems, such as requirements to conduct independent design adequacy reviews, ensure appropriate standards are selected, perform gap analyses, follow up with cost-benefit analyses for upgrades, and define meaningful operational inspection criteria. LANL has a solid effort underway to develop institutional requirements and recently established the position of Facilities Chief Engineer. This person is expected to provide technical leadership and be the authority having jurisdiction on LANL engineering standards, except those assigned elsewhere (i.e., fire protection, electrical safety). These initiatives are still in early stages, will take time to implement, and are limited to facility work – even though LANL programmatic divisions have responsibilities for many safety systems.

Weapons Engineering Tritium Facility (WETF): WETF is undergoing a readiness assessment (RA) focused on preparation for Building 450 startup and verification of Technical Safety Requirement (TSR) implementation. This includes examining closure of 67 pre-start findings from the LANL Operational Readiness Review (ORR) from a year ago (site rep weeklies 11/22/02, 12/20/02). The RA should conclude in early December. The DOE ORR is tentatively scheduled for late January but may slip due to the site-wide priority on implementing the interim work control improvements.

This week, WETF declared a positive unreviewed safety question based on new information indicating a 10 % increase in the frequency of the bounding, lightning-initiated tritium release. The new information came from a custom site analysis during the 2nd expert's lightning protection review: particularly, predicted flash probability is 46 times higher than the previous. Among the 2nd expert's conclusions are (1) a scenario that results in breach of one or more tritium storage containers is incredible; (2) the facility and lightning protection system designs cannot prevent arcing, but either the system or facility will provide the lightning attachment point, reducing total current; and (3) the dominant lightning-related contributor to overall risk is breach of thin-walled tritium system tubing.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 5, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending December 5, 2003

Martin and Stevenson were on site this week participating in a dynamic experiments design review.

Integrated Safety Management (ISM): Last Wednesday (11/26), LANL issued the results of its investigation into the five TA-55 workers exposed to toxic vapors (i.e., refrigerant degradation products) while soldering a piping joint for a rerouted coolant line (site rep weekly 10/3/03). The identified direct cause was worker failure to recognize abnormal conditions. The root causes were failures in the ISM process: specifically in defining the work, identifying the hazards, ensuring performance. Many organizations were involved. Roles and responsibilities were not clearly identified. Communications were disjointed. Organizations made assumptions about other organizations' responsibilities for hazard analysis and development and verification of controls. The radiological hazard was the focus to the exclusion of other hazards. There was no effort to incorporate and resolve different requirements contained in various work documents. The LANL investigation team concluded that the interim work control improvements now underway could conceivably have prevented the accident had they been in place at that time – particularly, the requirements for a single person-in-charge, clear roles and responsibilities, and verification walk-downs. The LANL team also identified areas where the interim work control improvement effort needs to be strengthened.

Waste Operations: Last Friday (11/28), the NNSA Site Office approved with comment the upgraded safety basis for the TA-54 (Area G) solid waste operations (site rep weekly 5/9/03). The analyses of the postulated accident scenarios predict high consequences for several low probability events. LANL is limited in available engineered controls. NNSA approved TRU waste containers, pallet banding, waste storage domes and door restraints as safety class; approved the lightning protection system as safety significant; and approved shaft covers, pit overburden, and SeaLand containers (for fiberglass reinforced plywood crates) as other design features. The key administrative controls are inventory limits. This includes an NNSA-imposed requirement to meet the Quick-to-WIPP commitment – ship off-site about 2,000 drums of dispersible, higher-source term material by September 2004. NNSA directed LANL to submit within 60 days a plan for stepping down the material-at-risk limit over time.

The site rep agrees with the high priority NNSA has assigned to the Quick-to-WIPP initiative. This is the best near-term action available to achieve significant risk reduction in Area G. On engineered controls, the specification of functional requirements and the assurance that the selected design features will meet requirements are substandard; however, it appears that nearly all the engineered controls available without major capital investment have been pursued. The site rep also believes that NNSA and LANL should pursue operation of the Decontamination and Volume Reduction System (DVRS), which is unfunded for FY-04. DVRS could address plywood crate integrity concerns, reduce collocated combustible and radioactive inventory, and thereby reduce risk (site rep weekly 9/19/03). While SeaLand containers may be appropriate for crates that won't be processed for some time, that pathway increases crate handling and associated risks and may become an excuse to delay processing the crate contents into a form acceptable for WIPP. DVRS is their only foreseeable disposition path.

Quality Assurance (QA): NNSA in its approval letter for the Area G safety basis identifies several quality issues with the LANL safety analysis. Separately, on Tuesday, the NNSA Service Center reported similar quality issues with the LANL SAFEKEG Safety Analysis Report for Packaging (SARP). Besides common quality concerns, transportation container certification issues such as these may affect DOE capability to perform its missions and achieve risk-reduction throughout the complex.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 12, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending December 12, 2003

Contardi, Kasdorf, Leary (OE), Rosen, and Tontodonato were here this week reviewing LANL nuclear material management and stabilization, including 94-1 progress and the TA-55 Type B investigation.

Recommendations 94-1/00-1: It's been nearly 10 years since the Board's initial recommendations on nuclear material stabilization. LANL is the last remaining DOE site without an implementation plan accepted by the Board. Since 1995, LANL has stabilized about two-thirds of the excess and programmatic inventory identified by LANL as 94-1. LANL has also made progress this year in processing and in designating more material for WIPP; however, a sense of urgency has been lacking – from both NNSA and LANL. Due to the Type B and increased recognition of worker safety issues, LANL is now engaged in a comprehensive evaluation of the inventory, packaging, storage, and management of nuclear materials. Three example areas that could accelerate progress are: (1) reevaluation of the economic discard limit (EDL) - currently residues with little value are being processed to meet an outdated EDL; (2) expediting design, installation, and startup of a dedicated line for processing non-weapons grade plutonium (i.e., the exposure reduction line) – while the gloveboxes are there, the line is not scheduled to startup until the 2007 time-frame; (3) development and application of institutional standards. Considering both safety and mission implications (i.e., vault space, Type Bs), higher priority on closely managing, stabilizing, and disposing of residues is overdue.

Federal Oversight: LANL has made progress during the last year in self-assessment and performance assurance, but both the issues that have occurred and the extent of progress that has taken place indicate a continuing need here for strong federal oversight. The NNSA Los Alamos Site Office (LASO) has played a pivotal role in LANL making progress; particularly in operations, subject matter expert (SME) reviews, and increasingly program liaison (e.g., lab support of Pantex). Recent examples include the strong federal roles in the initiation and development of the interim work control improvements and in the TA-55 type B investigation. For example, the NNSA Type B team identified safety issues that led LANL to suspend Pu-238 operations that generate waste or residues. Recent LASO efforts to help define scope and resource requirements for lab support of Pantex are noteworthy.

While these are encouraging, LASO appears to have technical staffing issues that constrain it from meeting its current responsibilities – much less meeting expanded responsibilities under the NNSA re-engineering. For example, NNSA has performed few readiness assessments (RAs) or comparable verifications at LANL during the last 2 years, relying mostly on the NNSA facility reps (FRs) to monitor LANL verifications. That said, the number of FRs has dropped nearly in half during that period (from 18 in late 2001 to 11 now), and collateral duties impact their in-facility time. Currently, only 4 FRs are deployed in their assigned facilities. The rest are on temporary assignment providing technical assistance to LANL in implementing the interim work control improvements. For a few weeks now, major facilities (i.e., CMR, solid/liquid waste operations, DARHT, radiography facility) have lacked day-to-day FR oversight (site rep weekly 11/21/03). This “tech-assist” is expected to end soon, but illustrates a common practice, increasingly used, that dilutes FR oversight.

LASO has increased the number of local SMEs from 2 to 4 in the last year. Recent hires are for maintenance and fire protection, but there still are weaknesses in SME support – such as sufficient qualified support for vital safety systems. The NNSA Albuquerque Service Center (100 miles away) has supported some verifications, but NNSA appears only marginally effective in using this resource.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 19, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 19, 2003

Plutonium Facility (TA-55): NNSA released this week the Type B investigation report on the 8/5/03 Pu-238 contamination event. The report identifies the direct cause as an airborne release from a degraded package containing cellulose material (i.e., cheesecloth) and Pu-238 residues. The root causes were (1) the LANL division failed to balance management attention and resources between accomplishing the programmatic mission and providing an appropriate level of protection for the workers handling Pu-238; (2) DOE, NNSA, and LANL failed to adequately evaluate and understand the magnitude of the worker safety risks that they have accepted for the activities conducted by the Pu-238 Group; (3) DOE, NNSA, and LANL managed DNFSB Recommendations 94-1/00-1 as projects for addressing legacy materials storage rather than as an effort to mitigate potential hazards to workers.

The failed package had been stored in the room since 1996, and was a can-bag-can configuration as previously described (site rep weekly 8/8/03). Chemical, radiolytic, and thermal decomposition of the contents and packaging caused the inner can and plastic bag to fail. Corrosion of the outer can appears to have caused the breathable seams to seal, allowing gas to build up. Simple handling of the package was sufficient to dislodge the corrosion and allow contamination to vent to the room. The failure mechanisms for all 3 "barriers" can occur simultaneously and independent of each other. The failure was similar to previous container failures that have been the subject of well-known reports since 1994.

The NNSA report states that the consequences could have been much greater and that it was nothing more than fortunate geometry and timing of the release that limited the consequences to exposed employees. Furthermore, there was no packaging configuration design; no analysis of contents and package material compatibility; no control on what could be placed in the package; no formal periodic package surveillance; no residue processing schedule; no limit on the quantity of Pu-238 that could be stored in the room; and no hazard control plan in place for the room or the activities conducted in the room. The identified issues are not limited to LANL but also include NNSA Site Office oversight of Pu-238 operations; DOE-NE and NNSA division of responsibilities for funding and oversight; and DOE, NNSA, and LANL management of 94-1 and 00-1 nuclear material stabilization. LANL has begun corrective actions for activities within its scope, such as the comprehensive inventory evaluation discussed last week. A corrective action plan is forthcoming.

Weapons Engineering Tritium Facility (WETF): LANL has completed a thorough readiness assessment (RA) for WETF on the full TSR implementation and on closure of open items for Building 450 startup (site rep weekly 8/1/03). The NNSA Operational Readiness Review is now expected in April 2004. The RA team complemented the facility on the TSR implementation effort but observed the need for improvements in configuration management, maintenance, and conduct of operations.

Training: Recently, LANL conducted an assessment of institutional training and identified issues that could impact nuclear facilities, such as not all lab organizations are effectively staffed and managed to facilitate a systematic training process that supports LANL missions; to the extent that training evaluations are done, they are not endorsed at the appropriate management level nor are results used to develop corrective action plans; and there is no policy governing worker disqualification following a training course failure. LANL is developing a corrective action plan. The NNSA Site Office has also begun an assessment of both institutional and facility-specific training.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 26, 2003

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 26, 2003

Weapons Engineering Tritium Facility (WETF): NNSA continues to owe the Board a rapid response on the functionality of the WETF NFPA 780 lightning protection system, which NNSA has designated safety-class (site rep weekly 11/18/03). LASO has provided input to NNSA headquarters. During the last year, two experts have concluded that lightning-induced rupture of multiple containers is incredible and that the much lower consequence scenario involving burn-through of thin-wall system tubing is the dominant lightning-related risk. The remaining lightning-related scenario that could drive a need for safety-class controls appears to be one involving a lightning initiated fire that spreads to multiple rooms. WETF defenses against this scenario included fire barriers and storage containers (both safety-class), fire suppression (safety-significant), and the combustible control program.

The site rep observes that the lightning protection system does nothing to prevent fires initiated by other sources - in fact, WETF had a small, uncontrolled flame from a failed electrical component under a glove-box in May, comparable to a small candle flame. More attention also is warranted on periodic inspection and upgrades of the safety-class fire barriers - particularly, upgrading the 1-hr fire rated wall between the vault-like room and the adjoining process room. NNSA and LANL may need to re-examine WETF fire accident scenarios and the selected controls in a more holistic sense.

Engineered Controls: NNSA and LANL need to apply more attention to ensuring that the engineered controls selected have clearly defined safety functions, that they will fulfill those functions, and that they constitute a complete set. The WETF issue above is an example. Other examples are described in site rep weeklies 7/3/03 and 11/28/03. LANL has a solid effort underway under the Integrated Facility Management Program to develop institutional procedures, but that effort is not fully funded this year. Several of the procedures are now being piloted in LANL Waste Operations - e.g., screening design changes, developing a design change package, designating vital safety systems and systems engineers.

There are also several other unfunded critical needs - e.g., inventorying vital safety systems, fully updating master equipment lists (MELs, a recurring issue seen in several assessments), and developing an implementation plan for the revised DOE Facility Safety order (DOE O 420.1A). MELs are being updated for nuclear facility fire protection equipment. The systems engineer program is funded. Some aspects of DOE O 420.1A are moving forward, such as training and qualification of systems engineers.

LANL also has some projects that have developed mature approaches to conduct of engineering, such as the Dynex Vessel Design Team (a recent recipient of an NNSA Award for Excellence). This team is working at the state-of-the-art and, in fact, has made advances that will likely improve national consensus codes. An independent Blue Ribbon Panel has mentored the Dynex project, contributing to this success. The panel has conducted 37 in-depth reviews during the last 4 years (cumulative time: 150 days), providing critical technical feedback. The project constructively accepted the feedback and made improvements in vessel design, quality assurance, and configuration management. Recently, the DARHT 2nd axis commissioning team (also working at the state-of-the-art) adopted some of these improvements, such as continuous peer review, bi-monthly independent reviews, and configuration management. NNSA and LANL would be well-served to review these two projects and possibly others (e.g., the Pu-238 scrap recovery line, the TA-18 temperature scram installation) for common lessons learned that could lead to site-wide improvements in engineered controls.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 2, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 2, 2004

LANL declared the new EOC operational last week before closing for the holidays (12/25/03-1/2/04). LANL management is also pursuing engaging with an industrial partner to help improve operations in nuclear and high hazard facilities.

Waste Operations: Last week, NNSA approved the updated safety basis for RANT - the Radioassay and Nondestructive Testing Facility (TA-54-38), subject to 16 conditions of approval. RANT has been up-rated to a Hazard Category 2 (HC-2) nuclear facility. RANT does nondestructive testing of TRU waste packages and loads them into TRUPACT containers for shipment to WIPP. Approved safety-class engineered controls include vented waste packages, building structure, fire suppression, TRUPACTs, pipe over-packs (for sealed sources). The interior fire wall and bridge crane were designated as safety-significant. The main administrative controls (LCOs) are on material inventory and the fire suppression system operability. WIPP shipments have been on hold since October (site rep weekly 10/3/03). Resuming safe shipments is key to LANL reducing TA-54 risks via the Quick to WIPP program.

NNSA directed that the RANT safety basis (BIO, TSRs) expire in 5 years (12/08) and that cost-benefit analyses be done on seismic vulnerabilities. While LANL believes the facility met code when it was constructed (1989), it's questionable it meets either PC-1 or PC-2 requirements now. NNSA also questioned the adequacy of the fire suppression to activate during small to medium fires.

Welding Issues: LANL has identified, via self-assessment, that some welding processes used on site may not have complied with national consensus codes and that this may have resulted in (a) welding not being done by welders who were qualified and holding current certification; (b) welding procedures not appropriately reviewed and approved prior to use; and (c) welding equipment and materials not procured and controlled to defined procedures. The site rep understands these issues extend to some nuclear facilities (e.g., CMR) and that LANL is preparing a corrective action plan.

Chemistry and Metallurgical Research Building (CMR): NNSA owes the Board a rapid response on safety system functional classification issues at CMR – particularly, whether that portion of the electrical distribution system that supplies power to supply and exhaust fans warrant functional classification as safety-significant (ref: Board letter 8/19/03). The current CMR Safety Basis (a BIO) credits ventilation as the safety-significant backup to the safety-class fire suppression system to protect the public. In discussion with the staff, NNSA has asserted that the passive ventilation mode provides adequate protection (i.e., no power requirement), but justification is lacking. CMR functional classification is expected to be examined when the BIO is updated. The BIO update has slipped from January 2004 to March 2004.

Critical Experiments Facility (TA-18): NNSA also owes the Board a response on the ability of new TA-18 safety-class temperature scram systems to perform their safety function (Board letter 7/9/03). The response is due prior to LANL removing interim safety controls or by September 2004, whichever occurs first. Last month, NNSA Albuquerque Service Center conducted an independent review of the new systems installed in SHEBA and Planet. The number of issues raised by this independent review indicate there would be value to including this project in a site-wide lessons-learned review of conduct of engineering, if one were to be conducted as discussed last week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 9, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 9, 2004

Plutonium Facility (TA-55): This week, TA-55 began decon of the room contaminated by Pu-238 last August (site rep weekly 8/8/03). The job was planned and the work released via the new interim work control process. Controls selected are appropriate. Workers were instructed to inspect containers before moving them. TA-55 still needs to complete a Unreviewed Safety Question (USQ) before removing containers for access to decontaminate the cages. Relatedly, DOE Office of Enforcement plans in early February to conduct an on-site investigation into the contamination event.

Radiological Protection: The NNSA Site Office has requested LANL to promptly submit interim compensatory measures that address compliance issues with the Occupational Radiation Protection Rule (10 CFR 835). LANL Audits and Assessments identified the issues in a partial assessment in early November and reported their findings in late December. They plan to assess all elements of the Rule in one-third increments during the next 3 years.

The LANL team concluded that the radiation protection program generally implements the elements of the Rule that were reviewed; however, weaknesses exist in communicating radiation hazards and controls to workers and in meeting qualified training standards and record-keeping requirements. They observed that, without communicating and controlling the hazards and without providing qualified training, the laboratory cannot ensure the safety of workers and compliance with regulations. The team did identify noteworthy practices, particularly the quality management efforts in the radiation protection services group. The site rep observes that the training and qualification issues here are similar to those identified during a LANL institutional training review last fall. Issues with communication of hazards and controls also drove NNSA and LANL to pursue the interim integrated work control improvements currently underway (site rep weeklies 10/17/03, 12/19/03).

Authorization Basis (AB): In November 2003, the NNSA Site Office approved LANL proposed categorization of 11 environmental sites as Hazard Category 2 or 3 nuclear facilities, and requested LANL to perform a USQ evaluation on another 12 sites that are within the boundaries of existing nuclear facilities. One other candidate site is still being evaluated. LANL proposed these facility classifications after reviewing about 900 potential environmental release sites. The new Hazard Category 2 (HC-2) sites include material disposal areas in TA-21, TA-49, TA-50 and an underground spent resin tank in TA-53. The new HC-3 sites include material disposal areas in TA-21 and TA-54, sodium storage tanks in TA-35, former liquid disposal areas or treatment sites in TA-10 and TA-35.

Los Alamos Neutron Science Center (LANSCE): NNSA and LANL consider LANSCE to be a non-nuclear facility with exceptions: the 1L spallation target and certain actinide experiments in the Lujan Center and an inactive target station in Area A are considered HC-3. LANSCE is governed by four separate AB documents – 3 BIOs and an interim safety assessment – approved between 2000 and 2002. LANSCE appears to be compliant with this AB. They plan to submit an integrated AB this summer.

The NNSA Site Office has identified that LANSCE has not yet addressed all the recommendations in a Fire Hazard Analysis (FHA) prepared in 2002 after the AB documents were approved. The main open issue appears to be combustible loading in the Lujan Center – due to 8 tons of bare polyethylene shielding surrounding the 1L target's thick steel shield. LANSCE is assigning higher priority now to the remaining FHA recommendations and is planning to clad the polyethylene when funds are approved.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 16, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 16, 2004

Integrated Safety Management (ISM): Last September, 5 workers in the Plutonium Facility (TA-55) were exposed to highly toxic vapors while soldering a rerouted coolant line in a poorly ventilated anti-contamination tent. The event and conclusions of a thorough LANL accident investigation have been previously reported (site rep weeklies 10/3/03, 12/5/03), but they warrant further consideration.

Even though there had been months of planning, the workers had no forewarning of possible toxic hazards. One of their first indications of a problem was when they observed spraying liquid from a line that they thought had been purged. They continued to work. Their first warning was when they experienced respiratory distress after heating piping joints for about 5 minutes. Per the LANL report, if they had not immediately evacuated the tent, there could have been serious injuries, including possible fatalities.

During the investigation, LANL identified multiple breakdowns. Some were driven by conflicting safety controls. Others resulted from mis-communication, misunderstandings on responsibilities, and reliance on conversation or other records over work-site walk-downs. For example:

- Due to radiological control and waste minimization concerns, the workers were wearing flammable coveralls and latex gloves while working with the acetylene torch, counter to their flame permit. This has some similarities to conditions that resulted in a fatality at Oak Ridge K-25 in 1997. In that case, the worker's vision was more obstructed, and he was working alone.
- During the actual work, the workers expressed conflicting concerns on when to operate the ventilation blower – considering the potential for contamination spread vs the need for air flow during hot work. Even then, the controls in place did not include local task exhaust recommended by the coolant Material Safety Data Sheet when applying heat.
- The tent was an informal addition to the work package, and the hazards it presented were not evaluated. It may have amplified the toxic vapor concentration by an order of magnitude.
- There were multiple opportunities by various organizations to identify the chemical hazards during the planning phase, but they did not engage appropriate subject matter experts. They did not realize how ill-informed they were on the hazards, and incorrectly identified the hazards on multiple work package forms. Since no chemical hazards were identified, the workers believed that all the hazards had been identified and removed.

The LANL report includes a gap analysis of the event against the new integrated interim work controls being implemented (site rep weekly 10/31/03). It concludes that these new work controls could conceivably have prevented the accident, but they must be strengthened. The site rep believes that these new controls are the most positive actions that have taken place here to improve worker safety during the last two years. This event and LANL's subsequent investigation strongly reinforce the needs for full implementation and continued improvement in LANL work control.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 23, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 23, 2004

Management: A team from the Institute of Nuclear Power Operations (INPO) was on site this week providing insight on potential improvements to the lab's corrective action program.

Quality Assurance (QA): While many LANL organizations implement QA (e.g., pit manufacturing), LANL does not have a DOE approved institutional QA Program and has self-reported that it is non-compliant with the QA provisions in the Nuclear Safety Management Rule (10 CFR 830, subpart A). Last April, NNSA concurred in a LANL plan to achieve institutional compliance in about 2 years - by March 2005. This requires a major effort and is proving tougher than originally projected. It's behind schedule. Areas where improvements have been made include: establishment of a senior management quality steering group; issuance of lab-wide requirement documents (LIRs) for software QA, issue management, and management assessment; internal assessments on training, weapons engineering; new expertise assigned full-time to institutional QA, both within LANL and the NNSA Site Office; and the INPO review of LANL corrective action programs. Last week's first meeting of the QA network was very encouraging. LANL has dozens of enthusiastic QA professionals with years of experience distributed throughout the lab. The QA network provides an opportunity for them collectively to help improve the institution. They need their management's support to make this a priority. By vigorous follow-through, LANL could achieve a state where business, safety, and mission improvements are driven more by assessments and less by events, such as accident investigations.

Training: One QA criterion is to train and qualify personnel so that they are capable of performing their assigned work (10 CFR 830.122, criterion 2). The NNSA Site Office is conducting a training assessment, to be done in May. A LANL institutional assessment last August identified that not all lab organizations are effectively managed to facilitate using a systematic-approach-to-training process that supports the mission; training evaluations, to the extent they are conducted, are not endorsed at the appropriate management level; evaluation results are not used to develop corrective action plans; training and qualification contractual requirements are not all reflected in lab implementing documents, nor have all required actions been implemented. Two earlier LANL reviews (1/03, 10/02) identified similar issues. LANL has a corrective action plan for the August assessment and is obtaining off-site expert assistance. Sufficient information appears available now to identify priority training improvements that could enhance safety and mission performance (site rep weekly 12/12/03).

Weapons Engineering Tritium Facility (WETF): This week, the NNSA Site Office modified the WETF Technical Safety Requirements (TSRs) and approved a positive Unreviewed Safety Question Determination involving an increase in lightning strike frequency (site rep weekly 11/28/03). NNSA asserts that tritium storage container burn-through is credible without a maintained lightning protection system (LPS); that the LPS prevents fires; that the 2 expert evaluations on LPS were mitigated analyses; and that for these and other reasons, the LPS needs to be Safety Class. NNSA states that this effort has reinforced the importance of the fire barriers and of the thermal adequacy of containers – both already Safety Class. NNSA continued to impose a stringent tritium inventory limit unless fire barriers are upgraded. LANL is performing a 3-month cost-benefit study of potential LPS improvements – ranging from mods to achieve Faraday cage equivalent protection to a local lightning early warning system.

TA-18 Mission Relocation: The conceptual design is near completion for relocation to the Nevada Test Site. NNSA is holding a review next week (1/27-28) in Washington DC of the CD-1 package.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 30, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 30, 2004

Quality Assurance (QA): In November 2002, the Secretary of Energy provided the Board a Quality Assurance Improvement Plan. The plan includes an action to validate and verify that QA programs are effectively implemented for vital safety systems (action 3.3). As an initial step, A NNSA-LANL team has completed a thorough independent assessment of the design, procurement, and operation of the new TA-18 in-core temperature monitoring system (ITMS). The team identified both lab-wide and TA-18 specific issues, as well as opportunities to improve these types of assessments. Their assessment continues next week on construction and fabrication and on software quality assurance.

Critical Experiments Facility (TA-18): In July 2002, NNSA approved a new TA-18 safety basis, which included developing and installing the new ITMS in each of the five critical assemblies. ITMS is intended to shutdown an assembly before partial core or sample vaporization. This postulated accident scenario is new for TA-18 and has low probability but high off-site consequences (i.e., 1000 Rem range). The ITMS is the Safety Class engineered control to prevent the accident. The systems have been installed in two assemblies, Planet and Sheba, but have not yet been through readiness assessments (RAs). As of last November, the RAs and a response to a Board letter (7/9/03) were the last remaining steps before ITMS are declared operational. Interim administrative controls are in place now.

As of this week, four independent sets of reviewers have raised issues on the ITMS – either (a) that a temperature based scram will be difficult to verify with confidence that it will work when needed, or (b) the temperature scram systems designed and installed in Planet and Sheba have not been adequately reviewed and do not meet the pedigree expected for Safety Class systems. The four reviews are:

Board letter (7/9/03) - A Board letter and staff report raised both these issues last year. Among many observations, the staff suggested that it might be better to pursue a nuclear instrument (NI) based scram as the Safety Class defense, given the challenges. NNSA has not responded to the Board's letter.

NNSA-LANL QA review - The review discussed above identifies significant design and procurement issues, particularly the need for LANL to charter an independent design review – not done to date. The team found, that while TA-18 has good QA processes, they failed sometimes to follow those processes.

LANL Reactor Safety Committee (RSC) - The last 3 RSC annual reports have stated that the RSC is skeptical as to the real benefit that will accrue from the ITMS. In FY 01, the RSC emphasized that the existing NI based scram systems must be maintained to existing requirements. Last November, the RSC reported that TA-18 had identified a possible need to redefine "burst mode" as greater than \$0.80 reactivity since the automatic temperature scram systems are not fast enough. It is unclear how such a redefinition would resolve slow temperature-scram response time and thereby improve nuclear safety.

NNSA Albuquerque Service Center - Last December, the NNSA Site Office chartered a Service Center review of the ITMS, which was completed this week. The review's scope was to determine whether the ITMS design, installation, and testing incorporated appropriate standards and requirements for its Safety Class function, and whether line management has a process to verify and document that the design was correctly developed, components properly purchased, and installation properly tested – for Safety Class. This was also a thorough review. The team concluded that the ITMS only met 1 of 17 criteria that were used to assess the system. LANL has not addressed all requirements expected for Safety Class systems.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 6, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 6, 2004

Plutonium Facility (TA-55): Last week, the NNSA Site Office endorsed a LANL recommendation to install a new diesel generator and upgrade TA-55 electrical switchgear so that power is automatically restored to key electrical loads, like confinement ventilation. LANL estimates that this will reduce risk by 18% and 6.5% to the public and workers, respectively. A funding source is to be determined.

LANL's electrical evaluation is based on the proposed new TA-55 safety basis, submitted nearly two years ago and still not acted upon by NNSA. At this point, the proposed safety basis itself needs updating (Site Rep weekly 10/24/03). Safety basis updates are expected to be proposed and approved once per year, but this has rarely occurred for LANL nuclear facilities. The current TA-55 safety analysis report and technical safety requirements (TSRs) were approved in 1996 and 1999. The need for this particular electrical power evaluation arose from a DOE commitment to the Board made in March 1996 and then revised in May 2001, when it was linked to the long-delayed new safety basis.

Recommendations 94-1/00-1: Progress has stalled on installing large vessel clean-out equipment in the Chemistry and Metallurgical Research Building (CMR) Wing 9 (site rep weekly 6/20/03). The delay is due in large part to unclear expectations between LANL and NNSA on whether this constitutes a major facility modification and on the maturity and pedigree required of the safety analysis before LANL takes receipt of major components. Ventilation components are already in place. Delivery of the confinement enclosure has been on hold since about January 5th. LANL submitted a process hazard analysis for approval on January 16th. NNSA action is pending.

This and other LANL projects have been adversely impacted by lack of clear, specific criteria on what constitutes a major facility modification requiring a preliminary documented safety basis (PDSA), as well as lack of explicit management commitment early in each project's lifetime on how safety basis development and NNSA safety basis approvals will be sequenced into the acquisition process. LANL construction management requirements do include checklists for assigning responsibilities during the conceptual phase for preparing a safety strategy and for identifying safety systems.

Radioactive Liquid Waste Treatment Facility (RLWTF): This week, NNSA approved the PDSA submitted in October for the new TA-50 pump house & influent storage facility, with 0.3M gal capacity. This is a new Hazard Category 2 nuclear facility addressing lessons from the Cerro Grande fire (site rep weeklies 8/30/02, 1/17/03). The project is nearly a year behind, in large part due to 3 iterations on the PDSA. The new tanks will normally receive low-level wastes (500 nCi/L, ~1 Ci max total). TA-55 transuranic liquids go elsewhere in RLWTF. The bounding accident assumes major combined upsets that dump the entire RLWTF inventory and a TA-55 discharge into the new tanks – 182 Ci Am-241 equivalent. This postulated accident has off-site consequences of about 5 Rem. Designated safety-significant systems include: tank vents; fire suppression; building design (PC-2); lightning protection; vehicle barriers; liquid system confinement; underground piping; and safety shower/eyewash units.

Authorization Basis (AB): Because of their importance, safety basis documents need to be quality documents – clear, complete, correct, concise. The recent NNSA approval record on WETF lightning protection lacks clarity, is incomplete, and may not be correct – it's unclear (site rep weekly 1/23/04). It is not a quality document. The NNSA letter also attempts to address broad issues and then imposes safety basis changes, bypassing the normal process of NNSA holding LANL responsible for formally recommending and justifying such changes. In essence, the "checker" became the "doer." NNSA has frequently commented on quality in LANL AB correspondence and could set a better example.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 13, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 13, 2004

Goff, Kupferer, Martin, and Quirk were here this week reviewing the new TA-18 temperature scrams.

Critical Experiments Facility (TA-18): NNSA owes the Board a report on how the new Safety Class in-core temperature monitoring systems (ITMS) will perform their intended safety function and thereby prevent core and sample damage (site rep weekly 1/30/04). While some progress has been made, the questions posed in the Board letter (7/9/03) and accompanying staff report remain open.

According to approved safety analyses, the ITMS is Safety Class to prevent postulated accidents with off-site consequences up to 1,000 Rem CEDE range. Only critical assemblies with transuranic cores or samples are capable of generating consequences in this range. Accidents for uranium fueled assemblies with small samples (e.g., less than ~25 g Pu metal) fall below the evaluation guidelines.

NNSA and LANL have no expectation of the temperature scrams working for higher reactivity insertions (e.g., above \$0.80, including Godiva & SHEBA burst operations). The current administrative controls are the primary defense against the accident and thereby appear to be Safety Class admin controls, in the sense of the Board's Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*.

In approving the temperature scrams, the NNSA vision is to remove the human element from the scram sequence for reactivity insertions ranging from \$0.20 to \$0.80. This range requires scram response times ranging from several minutes down to about 10 sec to prevent damage. In advance of ITMS being declared operational, LANL has admin controls and interim compensatory measures in place now to prevent the accident. These are also equivalent to Safety Class admin controls.

The admin controls cited above have not yet been evaluated per Recommendation 2002-3. The effectiveness of these controls relies highly on the training and qualification of the TA-18 operators. TA-18 currently is undergoing operations management turnover. TA-18 also has lacked a Facility Rep (FR) since mid-December and will likely not have a full-time qualified FR for several months.

The answer on whether ITMS will work depends on a benchmark study that TA-18 expects to issue in March. The answer on whether the design needs to meet Safety Class separation and independence requirements depends on a fault tree analysis still in review in TA-18. These are major open issues, considering that the new systems are installed in 2 assemblies and 90% designed for the other 3.

Another major issue with the ITMS is the lack of a thorough independent design review. TA-18 acknowledges this deficiency, but has not yet factored time into the schedule for such a review and for deliberate resolution of comments. TA-18 also has issues with the recent NNSA evaluations that raised questions on whether the designs have been correctly developed, components properly purchased, and installation properly tested for Safety Class (e.g., TA-18 used graded approach). NNSA and LANL now consider those evaluations as "draft" while TA-18 conducts factual accuracy reviews, to be done soon.

Besides ITMS, the staff reviewed TA-18 preparations to operate SHEBA (the Solution High Energy Burst Assembly) in burst mode. SHEBA has never been in burst mode. While progress is evident, there is a lack of independent review and of formality of closure for issues, some years old. Clear criteria are also needed on what would constitute an abnormality during approach to burst warranting further evaluation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 20, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 20, 2004

Critical Experiments Facility (TA-18): TA-18 has completed their factual accuracy reviews of the two external assessments of the new temperature scram systems (site rep weekly 1/30/04). The two assessment teams are updating their reports, based on the comments. At this time, the basic conclusion appears unchanged: LANL hasn't addressed all requirements expected for these Safety Class systems.

Waste Operations: In November, the NNSA Site Office approved with comment the upgraded safety basis for the TA-54 TRU solid waste operations. Safety analyses of the postulated accident scenarios predict high consequences for several low probability events. LANL has limited available engineered controls; however, NNSA believes that shipping ~2,000 drums with the highest, most dispersible inventory by end of FY 04 would reduce risks by, at least, 70%. This is the Quick-to-WIPP Program.

WIPP shipments have been on hold since October. LANL and the NNSA Site Office have engaged in an extensive effort to address issues and verify readiness. The Site Office recently requested DOE Carlsbad Field Office (CBFO) agreement with a proposed path-forward, including agreement to daily shipments to WIPP for four months, starting in June. The site rep observes that: (1) achieving this risk reduction in TA-54 appears to be essential; therefore, expedited resumption of safe and compliant WIPP shipments needs to be a management priority; (2) once shipments are restarted, operations need to be deliberate, since expedited operations (e.g., daily shipments) could lead to safety or compliance issues. It may be worthwhile for DOE to reevaluate the Quick-to-WIPP September 2004 deadline.

Authorization Basis (AB): The NNSA facility rep at TA-54 recently determined that the Pu equivalent definition in the TA-54 safety basis is unclear and is based on references to outdated documents. AB verification and implementation require clear definitions. NNSA has requested LANL to correct this.

Plutonium Facility (TA-55): Last week, LANL submitted to the NNSA Site Office the corrective action plan in response to the Pu-238 Type B investigation report (site rep weekly 12/19/03). The plan covers actions to minimize residues; conduct hazard analyses for packaging and storage; develop and implement improved work controls; verify those controls are in place; evaluate AB implications; establish a self-assessment program with specific criteria; establish a process to ensure flow-down of hazards and controls to work documents; and perform a comprehensive inventory assessment. DOE corrective actions in response to the Type B are still to-be-determined and require priority.

Cleanup of the Pu-238 contaminated room is progressing. LANL is preparing to submit an AB process hazard analysis for handling the residue containers and their interim storage in WIPP drums.

Chemistry and Metallurgical Research Building (CMR): Last Monday (2/9/04), management found deposits on the outer surface of one of the two Wing 3 exhaust fans. Initial samples indicated these were potentially shock-sensitive perchlorates at about 9 times the action level. CMR isolated the area, shutdown the fan, and prohibited Wing 3 work that could disturb ventilation. An emergency response team responded. Analysis last Tuesday of one sample indicates stable iron perchlorate. CMR is developing a work package to remediate visible perchlorates using appropriate personal protective equipment. CMR has a TSR admin control program focused on minimizing and controlling perchlorates, based on past experience. This event is motivating a review of that program.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 27, 2004

MEMORANDUM FOR: J. K. Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 27, 2004

The site representative was at DNFSB-Headquarters all week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 5, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 5, 2004

Martin was on site this week reviewing the status of dynamic experimentation.

Integrated Safety Management (ISM): Last Thursday (2/26), two workers escaped serious injury when the mobile crane they were transporting struck a 13.2-kV overhead power distribution line, separating all 3 cables of the 3-phase distribution line. This was a near-miss to fatalities. Power was lost to a large area for 3.5 hours. The crane was being transported to DARHT to replace another crane that had been damaged by misuse. While this was a non-nuclear operation, the sequence of events and the potential consequences are disturbing. NNSA has expressed concerns about the formality of DARHT operations leading up to this event and requested LANL to develop a lessons-learned report. LANL is investigating to identify improvements in the integrated work management process and in lab-wide maintenance and operation of heavy equipment, including operator qualification.

Critical Experiments Facility (TA-18): NNSA owes the Board a response on the ability of new TA-18 safety-class temperature scram systems to perform their safety function (Board letter 7/9/03). The NNSA Site Office (LASO) has expressed serious concerns about safety, design, and procurement issues raised by recent assessments of these systems. LASO is directing LANL to address the issues and submit a comprehensive corrective action plan. LANL has suspended all work on the systems, and plans to complete an independent design review and to fully resolve the issues raised in the Board's letter. In the interim, the site rep believes that it would be prudent for NNSA and LANL to confirm that the admin controls and interim compensatory measures in place now to prevent the accident are effective. These are equivalent to safety-class controls (site rep weekly 2/13/04).

Weapons Engineering Tritium Facility (WETF): NNSA is overdue in its response to the Board on the functionality of the WETF NFPA 780 lightning protection system, which NNSA has designated as safety-class (Board letter 8/19/03; site rep weeklies 1/23/04, 12/26/03). LASO has provided input to headquarters. LASO recently made clear to LANL that WETF should reevaluate all accident scenarios, including lightning, in the next safety basis update. LASO is also pursuing an independent NNSA-led review by subject matter experts of WETF lightning protection effectiveness.

Last week, LASO also directed LANL to upgrade the tritium storeroom fire barrier, which is also safety-class, from 1-hour to 2-hour fire rating; to aggressively pursue transferring inventory to safety-class containers with ASME pedigree; and to create, for all LANL nuclear facilities, clear and enforceable Technical Safety Requirement (TSR) implementing procedures that specify operability requirements and time limits. Actions are to be completed by September 2004.

Chemistry and Metallurgy Research Building (CMR): NNSA is overdue in its response to the Board on safety system functional classification issues at CMR – particularly, whether that portion of the electrical distribution system that supplies power to supply and exhaust fans warrant functional classification as safety-significant (Board letter 8/19/03; site rep weekly 1/2/04). LASO has provided input to headquarters. LANL is currently reviewing all CMR safety systems as part of a safety basis upgrade to be submitted in April. The site rep observes that confusion persists on the significance of the questions here. The current CMR safety basis, a BIO, credits ventilation as the safety-significant backup to the safety-class fire suppression system to protect not only the workers but also the public.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 12, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 12, 2004

Integrated Safety Management (ISM): LANL is investigating two unrelated radiological events that have occurred within the last week: (1) Last Thursday (3/4), a CMR chemist received contamination on her lips, chin, and neck (up to 18k dpm) while working in a hood. Decontaminating the worker extended over a two day period. The worker was pouring a 3 M nitric acid and plutonium/uranium solution into a column in the hood. Room surveys found contamination on the floor and the hood's sash lip. (2) This Tuesday (3/9), two LANSCE workers discovered that they were working in an uncontrolled, unrecognized High Radiation Area (~170 mrem/hr neutron) and immediately exited. Preliminary dose estimates are low (7 and 25 mrem). The workers were replacing equipment in one flight path of the Lujan Center while beam was on in the two adjacent flight paths. Work planning appears to have been based on radiation surveys with beam secured in the two adjacent flight paths. As a result of this event, LANL has suspended Lujan flight path maintenance and construction activities.

Authorization Basis (AB): LANL senior management recently established an executive committee to track NNSA and LANL progress on AB issues and re-prioritize effort, as appropriate. During the last year, NNSA and LANL AB staff have focused on accident analysis and risk reduction for TA-54 Area G and paid much less attention to other activities. Four nuclear facilities have ABs that are 5 to 8 years old. The TA-55 AB is 7 years old, and its AB update has been waiting for approval for nearly 2 years. Since November, LASO has disapproved one AB update, and LANL has withdrawn three. While Area G risk reduction is important, more balanced AB priorities appear warranted.

Chemistry and Metallurgy Research Building (CMR): The CMR AB is 5 years old. LANL owes NNSA an AB update next month, including a review of functional classification of safety systems. CMR has systems that may be playing a safety class role but are not now designated as safety class. For example, CMR has a containerization program intended to ensure that material not in active use is placed inside robust safes to protect it during catastrophic events. Last Fall, items within these safes were found packaged inconsistent with that during qualification tests (site rep weekly 10/31/03). LANL plans to include this storage system as a safety class design feature in next month's AB update.

Engineered Controls: LANL has several initiatives underway that could improve conduct of engineering and maintenance if fully developed and implemented, including: (1) the engineering standards manual, which captures requirements; (2) institutional administrative procedures that standardizes practices to meet those requirements; (3) and an institutional systems engineering program, including deployed systems engineers who would be trained and qualified to these requirements and procedures.

The engineering standards manual is the most mature of these and includes, for example, disciplinary design requirements, but not design processes or review requirements. It was made applicable last Fall to both facility and non-weapon programmatic work. The institutional systems engineering program started training personnel last September. It is currently limited to just facility work; however, a recent LANL tentative list of vital safety systems indicates that nearly two-thirds of these systems are programmatic (i.e., 59 of 93). The administrative procedure development effort is part of the Integrated Facility Management Program and is vital if LANL is to standardize engineering and maintenance practices across the lab. While well-conceived, this effort is also only applicable so far to LANL facility work and has had limited effectiveness, perhaps because it needs more senior management support. This week, NNSA began explicitly assigning personnel to perform oversight of LANL vital safety systems, which is positive.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 19, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 19, 2004

The Board and a staff team were on site this week. On Wednesday, Andrews, Jordan, and Contardi were here for informal, separate discussions on TA-55 Pu-238 operations.

Formality of Operations: Two recent examples indicate a need for more formality here in closure of safety issues before new operations or restarts to ensure there are no omissions that could affect safety. First - when approving the TA-18 safety basis in 2002, NNSA stated that the Solution High Energy Burst Assembly (SHEBA) shall not operate in burst mode until several studies are submitted to and accepted by NNSA. This includes addressing potential common mode failure of the two identical dump valves, which are the two safety-class shutdown mechanisms. Last month, LANL informed the staff these actions were complete; however, NNSA has not received and accepted the studies, and it is unclear who at NNSA and by what formal mechanism NNSA intends to accept closure of these items.

Second - last September, TA-55 curtailed processes that generate Pu-238 waste and residues because of potential safety concerns involving deterioration of the slip-lid containers (site rep weekly 9/12/03). On February 23rd, TA-55 management approved a resumption plan for the curtailed operations; however, the approved plan is based on draft documents, including a hazard control plan and a work instruction still in development and a process hazard analysis not yet submitted to NNSA. It is unclear that all the reasons for curtailment have been identified and formally addressed; that prerequisites have been satisfied and formally verified; and that implications of the Type B corrective action plan have been considered. From discussion with LANL, the intent was to restrict resumed operations to those within the glovebox lines, including residue pyrolysis, but LANL needs to resolve the container issues. These concerns may be addressed by the integrated planning effort described below.

Plutonium Facility (TA-55): LANL is engaged in integrated planning to address several inter-related needs involving Pu-238 operations, including: (1) resuming operations that generate wastes and residues; (2) progressing on the Type B corrective action plan (CAP); (3) starting up the new scrap recovery line and delivering heat sources in time for the NASA New Horizons mission to Pluto. Scrap recovery line startup has several apparent prerequisites: an explicit Technical Safety Requirement (TSR) revision that captures all the applicable controls; formal closeout and verification of LANL readiness assessment (RA) findings from last summer (~90 total, including 31 pre-starts - site rep weekly 8/1/03); a new LANL RA; and the NNSA RA. The scope of the new LANL RA is to be determined, but could include resumption of residue-generating activities and implementation of new work control processes. An integrated schedule should be available early next week.

LANL is moving ahead on the Type B CAP (site rep weekly 2/20/04). Efforts to decon the room to date have been well-planned and well-executed, but progress is on hold pending LANL submitting and NNSA approving a process hazard analysis for temporary residue storage locations and configurations. LANL also needs both NNSA approval of the CAP, and DOE and NNSA action on judgements of need under federal responsibility. The latter includes NNSA developing comprehensive criteria for safe stabilization, storage, and disposal of Pu-238 bearing materials, considering the full life cycle. NNSA needs to take timely action on these to support LANL safely moving ahead with these activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 26, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 26, 2004

Von Holle was here this week participating in the annual review of the weapons enhanced surveillance program. DeLoach was also here reviewing the NNSA Facility Rep program.

Plutonium Facility (TA-55): Higher priority and increased management attention appear warranted on NNSA and LANL reaching agreement on the scope and schedule of the Type B corrective action plan (CAP). Particularly, NNSA needs to take appropriate and timely action on the judgements of need under federal responsibility and on the LANL proposed CAP. Also, during the last two weeks, LANL has developed a deliberate, resource-loaded schedule leading to start up of the new Pu-238 scrap recovery line in September. There are some details still to be worked out during the next few weeks, such as linkage to the Type B CAP. The schedule does appear to capture key elements, including closure of July 2003 LANL readiness assessment (RA) findings, a technical safety requirement (TSR) revision, a management self-assessment, another LANL RA, and the NNSA RA.

Welding Issues: LANL has self-identified that some welding processes used on site may not have complied with national consensus codes (site rep weekly 1/2/04). Issues include qualification and certification of welders for nuclear safety and other critical systems; weld filler procurement and traceability; qualified weld processes and procedures; code-compliant weld inspections. The scope of this problem is likely large. Last November, LANL visually inspected 90 welds in CMR safety systems and identified 22 welds that did not meet acceptance criteria (e.g., arc strikes, undercut, overlap, lack of fusion, blow-holes, poor workmanship). This was a sampling inspection of fire suppression, ventilation, and ventilation wash-down systems.

For new welds, LANL is close to issuing a site-wide notice to specify proper controls via the new integrated work management system. This will affect new work on systems involving nuclear safety, high pressure, or structural hoisting and rigging. Longer term, LANL intends to implement a compliant welding program via the LANL Engineering Standards Manual. For existing welds, LANL has committed to performing facility and program-specific assessments.

Integrated Safety Management (ISM): The DOE Office of Price-Anderson Enforcement issued their investigation report this week for the TA-55 Pu-238 uptake event (8/5/03), the TA-55 toxic vapor exposure event (9/27/03), and LANL radiological protection program issues. An enforcement conference is scheduled for April 13-14. DOE expects LANL to also be prepared to discuss five other recent events: the mobile crane striking the 13.2 kV overhead line; the CMR facial contamination; LANSCE uncontrolled high neutron radiation area; TA-18 temperature scram design issues; integrated work control confusion on walk-down requirements. LANL has several investigations underway. The events are summarized in site rep weeklies 12/19/03, 1/9/04, 1/16/04, 2/13/04, 3/5/04, 3/12/04.

Emergency Preparedness: This week, LANL conducted its first large-scale drill in the new Emergency Operations Center (EOC), which was declared operational last December. This was a tabletop exercise, simulating a wildfire under weather and dryness conditions similar to those during the Cerro Grande fire (May 2000). Federal and County agencies participated. LANL is preparing for a full exercise in June. The last such exercise here was in June 2002 (site rep weekly 6/14/02).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 2, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 2, 2004

Bamdad, Jordan, Kimball, Stevenson (OE), and Zavadoski were on site this week reviewing ventilation and ventilation-related accident analyses for TA-55 and CMR Replacement.

Critical Experiments Facility (TA-18): NNSA announced Wednesday that half the special nuclear material (SNM) at TA-18 will be shipped to Nevada Test Site (NTS) during the next two years, starting in September. Few details are available now on how this will be accomplished and how NNSA intends to maintain qualified staffing and minimize the impact on the criticality safety program that NNSA has committed to under Recommendation 97-2. The TA-18 Relocation Project completed a conceptual design in January and is waiting on Critical Decision 1 (CD-1). The plan was to complete preliminary design in 2005, start construction at NTS in 2006, move material in 2009, start operations in NTS and decommission TA-18 in 2011. It is unclear what the plan is now.

The site rep understands that the project is meeting next week in Nevada to develop a plan and that SNM for Recommendation 97-2 related activities will likely be first to move. There are options that could maintain some continuity in the 97-2 program. Considering local implications, it is unclear when or how NNSA and LANL will resolve issues on whether the new safety-class temperature scram systems will perform their credited safety function (Board letter 7/9/03). These issues are likely applicable regardless of where the assemblies are located. It is also unclear how NNSA and LANL intend to manage the risk of current TA-18 operations during the transition. In advance of the safety-class temperature scram systems being installed, LANL has admin controls and interim compensatory measures in place that are equivalent to safety-class. As discussed in site rep weekly 2/13/04, the effectiveness of these controls relies highly on the management, training, and qualification of the TA-18 operators – areas that may warrant closer scrutiny during this transition.

Plutonium Facility (TA-55): NNSA has accepted a LANL proposal to upgrade the TA-55 electrical switchgear so that power would be automatically restored to key electrical loads, like confinement ventilation; however, funding remains uncertain (site rep weekly 2/6/04). NNSA headquarters has deferred to the Site Office on funding. The situation resembles that in 1996, when the Secretary of Energy committed to the Board to upgrade emergency power for TA-55 glovebox ventilation, but the issue was never resolved. Separately, LANL is working with the staff to address questions on ventilation seismic capacity and on conservatism in leak path factors in the proposed safety basis (4/02).

Chemistry and Metallurgy Research Building Replacement (CMRR) Project: CMRR has completed conceptual design and expects a CD-1 within the next 2 months. There may be hidden assumptions that affect safety, such as assuming no ball-milling and no Pu-238 operations. These need to be explicitly reconciled against mission needs and addressed. The project would also benefit if it had NNSA-approved principle guiding criteria that capture the top-level design strategy (e.g., engineered controls over admin controls, the need for post-accident monitoring). As-is, the approach appears to copy the TA-55 ventilation strategy, which may not be the best for either mission or safety.

Weapons Engineering Tritium Facility (WETF): WETF appears well-prepared for an NNSA Operational Readiness Review (ORR), starting on April 19th. The scope covers the Technical Safety Requirement implementation and neutron tube target loading (NTTL) being transferred from TA-21.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 9, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending April 9, 2004

The site rep was off site this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 16, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 16, 2004

Weapons Engineering Tritium Facility (WETF): The NNSA Operational Readiness Review (ORR) for Building 450 startup and WETF safety basis verification starts Monday.

Welding Issues: Last week, LANL declared a potential inadequate safety analysis (PISA) due to existing suspect welds on nuclear safety systems (site rep weekly 3/26/04). LANL has issued a site-wide notice to specify proper controls for new welds, and LANL systems engineers are visually assessing existing welds in nuclear safety systems, such as WETF tritium systems and TA-55 Pu-238 glovebox supports. Certified weld inspectors will inspect suspect welds found during these reviews. Initial assessment results should be available next week to support risk-based decisions on continued operation. This is a relatively quick look given the number of welds. LANL is developing a long-range plan for more detailed certified inspections of representative welds in all nuclear facilities.

Plutonium Facility (TA-55): NNSA has rejected a backward-looking Unreviewed Safety Question Determination involving cleanup of the room contaminated with Pu-238 last August. NNSA identified weaknesses in the 7-year-old final safety analysis report and could not verify that controls are adequate to address hazards in the room. It's unclear right now what the implications of this are on the cleanup effort and on addressing the large inventory of Pu-238 residues in the room.

TA-55 has clarified its strategy for resuming Pu-238 operations curtailed last fall because of concerns about residues stored in containers outside gloveboxes (site rep weekly 3/19/04). Residues are not to be removed and stored outside gloveboxes until after NNSA has approved a process hazard analysis and LANL has finalized associated hazard control plans and work instructions. Residues declared as waste may be removed from gloveboxes following existing waste handling procedures. Six operations are within scope: bench-scale aqueous scrap processing; fuel processing; pyrolysis & liquid residue processing; fueled clad decontamination; destructive testing and evaluation; and miscellaneous. Readiness for each will be verified by a management self-assessment (MSA). A validation walk-down with operator input, per the new integrated work control process, will be part of the MSA.

Radiography Facility (TA-8-23): Last week, NNSA formally suspended TA-8-23 operations with explosive and tritium items due to lightning protection deficiencies and confusion on the safety basis. TA-8-23 operates under a two-year-old Justification for Continued Operation (JCO). The safety basis confusion centers on whether the JCO and NNSA approval letter required the lightning protection system to be code compliant (NFPA 780). The lightning protection deficiencies were identified last July but have not been corrected. The facility had curtailed operations in March due to the lightning protection issues but had concluded that they were still within the safety basis. NNSA disagrees. LANL experts consider the system degraded but functional. The issues here (e.g., lack of clear operability criteria, delay in resolving known deficiencies) strongly parallel those identified in a Board letter of 8/19/03 for WETF. Institutionally, NNSA and LANL still need better criteria for operability, maintenance, and configuration management for these systems (site rep weeklies 3/5/04, 11/7/03).

Management: Ralph Erickson, the NNSA Los Alamos Site Office (LASO) Manager, was honored this week on the occasion of his retirement. Ed Wilmot has been assigned as the new LASO Manager.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 23, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 23, 2004

Weapons Engineering Tritium Facility (WETF): The NNSA Operational Readiness Review (ORR) started this week and will conclude next week.

Critical Experiments Facility (TA-18): LANL plans to conduct a management self-assessment (MSA) of TA-18 operations in early May in response to questions raised by the NNSA Site Office. Relatedly, NNSA and LANL are currently relying on a set of administrative controls and interim compensatory measures to prevent the most significant postulated accident in TA-18 – an uncontrolled reactivity excursion that causes melting and partial vaporization of a plutonium core or sample. These controls are the primary defense against this accident right now and appear to be equivalent to safety-class administrative controls, in the sense of the Board's Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*. However, most of these controls are missing from the current list of those to be verified in response to the Board's recommendation. The postulated TA-18 accident has the 2nd highest predicted consequence of any postulated accident in LANL nuclear facilities. It appears that these controls ought to be included and have priority for verification (site rep weeklies 4/2/04, 2/13/04, 1/30/04).

Plutonium Facility (TA-55): Higher priority and increased management attention appear warranted on NNSA and LANL reaching agreement on the scope and schedule of the Type B corrective action plan (CAP). Particularly, NNSA needs to take appropriate action on judgements of need under federal responsibility and on the LANL CAP proposed 2 months ago (site rep weeklies 3/26/04, 2/20/04).

Fire Protection: This week, The NNSA Site Office issued an assessment on fire protection system maintenance and requested LANL to provide a corrective action plan within 30 days. Among the institutional improvements needed are adequate funding to promptly restore impaired safety systems to service (based on lessons learned from a LANSCE fire-pump fire); adequate funding to reduce the deferred maintenance backlog; complete and accurate Master Equipment Lists (MELs). LANL is working to update the MELs for nuclear facility vital safety systems by September 2004.

Authorization Basis (AB): Annual updates of nuclear facility ABs have rarely occurred here. Also, neither LANL nor the NNSA Site Office maintains a complete list of AB documents. Some nuclear facilities maintain their own list. For example, it's been 7 years since the last TA-55 update was approved, and the current TA-55 list includes 88 documents (some of these are awaiting NNSA action). The diffusion of the AB over numerous documents for some facilities has been problematic for NNSA and LANL operations personnel who need to clearly understand what constitutes the AB. NNSA relies on LANL maintaining a complete list in the authorization agreements, as required by the applicable LANL Laboratory Implementation Requirement (LIR); however, neither LANL nor NNSA has enforced this requirement, and most authorization agreements are out of date (site rep weeklies 10/24/03, 2/14/03).

Radiography Facility (TA-8-23): LANL has placed TA-8-23 into cold standby due to self-identified non-compliances with the National Fire Alarm Code (NFPA 72), including with testing and inspection requirements. TA-8-23 is a Hazard Category 2 nuclear facility operating under a two-year old Justification for Continued Operation (JCO). Operations were already restricted because of lightning protection deficiencies and confusion on the authorization basis, as reported last week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 30, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 30, 2004

Integrated Safety Management (ISM): Several people in the Chemistry and Metallurgy Research building (CMR) were exposed this week to irritating vapors and received medical attention. The source was a battery charger in a space with potentially inadequate ventilation. LANL emergency personnel responded. There are questions on whether hazards were adequately identified and whether appropriate controls were place (e.g., formal equipment tag-out, personal protective equipment, monitoring equipment, flammable gas control). LANL is investigating.

Plutonium Facility (TA-55): TA-55 went into standby mode and suspended operations intermittently this week in order to troubleshoot the Uninterruptible Power Supply (UPS). The UPS failed last Friday during restoration from maintenance, raising reliability concerns, but the failure has not been repeatable. The system has since operated normally. UPS is safety-significant. When off-site power is lost, it provides power to select safety systems, including criticality alarms, the paging/general announcement system, and the facility control system. Compensatory measures are in place. While in standby, NNSA approved one special-case fissile material move to support a programmatic need.

Radiography Facility (TA-8-23): TA-8-23 resumed limited operations this week after implementing a standing order that requires posting an individual who can alert others in the event of a fire alarm.

Engineered Controls: NNSA and LANL need to apply more attention to ensuring that the engineered controls selected have clearly defined safety functions, that they will fulfill those functions, and that they constitute a complete set (site rep weekly 3/12/04, 12/26/03). Last Friday, LASO and LANL sent to NNSA headquarters a requested extension for a report to the Board on LANL plans to implement conduct of engineering and the DOE Facility Safety Order 420.1A (ref: Board letter 1/27/04, which includes a 90-day reporting requirement). While LANL has several solid initiatives underway for facility work, progress for programmatic work has lagged. LANL intends to move toward a single site-wide engineering program, covering both facility and non-facility work. Considering the magnitude of the task, LANL expects to have a plan by June 30th.

Administrative Controls: Board Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*, observed that there are administrative controls having a safety function that should be implemented with the same degree of rigor and quality assurance as that afforded engineered controls with similar safety importance. In March, LASO provided NNSA headquarters a list of LANL administrative controls to be verified in response to this recommendation. The list is a "shot-in-time" as some safety bases are being updated and some additional guidance and standards are being prepared.

The current list does not appear to meet the intent of DOE's implementation plan and the Board's recommendation and needs to be re-evaluated. It is not clear that all the nuclear facilities understood that the controls to be reviewed included not only administrative control programs but also limiting conditions for operations (LCOs) and surveillance requirements. It is also not clear that they understood that the controls to be identified are limited to those performing a function that ideally would be performed by a designated engineered safety system if such a system was installed.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 7, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 7, 2004

Integrated Safety Management (ISM): LANL senior management is committed to improving the LANL integrated work management process. Last week, the LANL Director issued an instruction outlining his expectations, including that people focus on the intent of the process and not just the documentation. LANL also has revised the interim work management requirements to incorporate lessons learned since the new work control process was put in place last November (site rep weekly 10/31/03). This is still an overlay on the prior work control processes. Two challenges are (1) standardizing expectations and preparation of the responsible division leaders or their designees, who now have increased personal responsibility for implementing the process, and (2) streamlining implementation for repetitive tasks, such as low-risk maintenance and surveillance. LANL has committed to developing and implementing process improvements (e.g., hazard identification and support tools), delivering training, and issuing new institutional requirements by September 30th.

Critical Experiments Facility (TA-18): LANL conducted a management self-assessment (MSA) of TA-18 operations this week, and the report is forthcoming. Also, the site rep observes that the current TA-18 authorization basis (AB) implicitly permits both Godiva and SHEBA to operate in delayed critical mode with a 150 g plutonium equivalent sample and with excess reactivity approaching \$1.00. The other assemblies are limited to \$0.80 with Division Leader approval, \$0.50 otherwise. The safety basis does not include an analysis of Godiva and SHEBA in the delayed critical regime. Instead, it has analysis for operations above \$1.00 (i.e., burst mode) that led NNSA to impose additional controls, such as restricting the sample size to zero during burst mode operations. LANL has issued a standing order with more explicit controls for Godiva and SHEBA and will propose such controls in an upcoming Technical Safety Requirement (TSR) revision. LANL is also reviewing TA-18 experiments against the hazards and controls. Review of the sample size and reactivity limits appears warranted.

Plutonium Facility (TA-55): TA-55 has traced the uninterruptible power supply (UPS) failure reported last week to a likely transient in a bypass switch during restoration from maintenance. NNSA has approved a TSR change to limit the significance of any future similar failure. Also, TA-55 has completed an MSA on resuming the Pu-238 aqueous recovery bench-scale process without ion exchange. This MSA was an improvement over some observed last year. TA-55 appears to have benefitted from increased institutional support, particularly the Performance Surety Advisor Program. The MSA included stepping through the process and tracing implementation of controls down to procedures. Some of these controls evolved from a process hazard analysis (PrHA) that LANL submitted 2 years ago to NNSA as part of the AB update but that NNSA has not yet approved. While this PrHA is likely the best information currently available on the hazards, NNSA needs to complete its review to ensure appropriate controls are in place.

Weapons Engineering Tritium Facility (WETF): NNSA has completed its Operational Readiness Review (ORR) and is preparing its report. Tentatively, the team identified 3 pre-start and 24 post-start findings, most of which were linked to institutional issues (e.g., conduct of engineering, training, welding, maintenance, quality assurance). There were few AB issues. The site rep observes that the NNSA ORR was thoroughly and professionally conducted, and that WETF was well-prepared. This was the culmination of several years of hard work by LANL, the Site Office, and, more recently, the Performance Surety Advisor Program.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 14, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 14, 2004

The site representative was at DNFSB-Headquarters all week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 21, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 21, 2004

Authorization Basis (AB): LANL nuclear facilities have declared several potential inadequacies in safety analysis (PISAs) recently. CMR declared a PISA on lack of controls for gasoline, fuel oil, and high explosive shipments near CMR. Such controls are assumed to be in place by the current AB. Radioactive Liquid Waste Treatment Facility (RLWTF) and Waste Characterization, Reduction, and Repackaging Facility (WCRRF), both in TA-50, have declared PISAs related to institutional welding issues (site rep weekly 4/16/04). TA-55 has declared PISAs on both discrepant Type A shipping drums and the bench-scale Pu-238 aqueous recovery operation (both discussed below). TA-18 and TA-55 have each declared PISAs related to container breach scenarios. It is positive that these issues are being reported; however, it may be worthwhile for NNSA and LANL to review them collectively to determine if there are systemic, institutional issues possibly related to the age of some of these ABs (i.e., time between reviews/updates), and the functionality and effectiveness of the selected controls.

Plutonium Facility (TA-55): NNSA has approved the corrective action plan (CAP) in response to the Pu-238 uptake event last August (site rep weekly 2/20/04). The CAP assigns actions to both NNSA and LANL; because of interdependencies, both must complete their actions on time for success. Last Tuesday (5/11), TA-55 declared a PISA on the bench-scale Pu-238 aqueous scrap recovery process. TA-55 recently resumed this process based on a hazard analysis submitted with the TA-55 AB update package two years ago but not yet approved (site rep weekly 5/7/04). Questions center on applicability of approved controls for the full-scale line (not yet started up) to the bench-scale process.

NNSA and LANL have established a joint team to re-review the two-year-old proposed TA-55 AB update (site rep weekly 3/12/04). NNSA intends to preserve independence by having separate personnel involved in the final approval review. Any additional updates would be incorporated into the NNSA safety evaluation report instead of revising the submitted safety analysis report. While expeditious, it would be less confusing if the AB was made complete and current prior to approval so that the safety analysis report and technical safety requirements were stand-alone documents.

Transportation: As a result of drop tests on DOT 7A packages, NNSA and LANL have imposed restrictions for on-site shipment of 55 gal drums containing fissile material (site rep weekly 11/7/03). Drums weighing 300 lbs or less are compliant to 49 CFR 173.465 requirements. Heavier drums can be shipped subject to a road closure and vehicle speed restrictions (35 mph). NNSA recently reported that about 65 % of the waste drums on site exceed 300 lbs; most of these are solidified waste; and about 6 % (~1,200 drums) both exceed 300 lbs and are in a dispersible form. LANL is evaluating the safety basis implications, such as for TA-54 Area G where the drums are considered safety-class. LANL is also preparing a plan to minimize generation of the heavier, non-solidified drums.

Radiation Protection: On May 5th, NNSA directed LANL to recalculate personnel internal dose estimates for the last year using the biokinetics model and reference man weighting factors from ICRP 30 and 26, respectively. The ICRP 30/26 approach was developed in the early 1980s, and a newer model and weighting factors are available (ICRP 60/66). However, the Radiation Protection rule (10CFR835) mandates use of ICRP 26. LANL had started to use the newer model with the older weighting factors (a possible data-to-model compatibility issue) and is planning to evolve to ICRP 60/66. The issues here may be applicable to other sites. An update to 10CFR835 may be warranted.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 28, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 28, 2004

DOT 7A Drums: As discussed last week, LANL has imposed restrictions for on-site shipping of fissile materials using DOT 7A drums. To be DOT compliant, these containers are required to be capable of withstanding several tests, including a pre-conditioning series of 1-foot drops on each quarter followed by a 4 foot free drop in a configuration causing the maximum damage.

Besides transportation, several nuclear facilities rely on these drums to safely confine materials during normal and accident conditions and to ensure sub-criticality (e.g., TA-54, TA-55, CMR). These facilities are currently assessing their needs individually; however, since LANL moves drums between facilities, it may be more appropriate if LANL pursued one set of bounding lab-wide criteria, possibly including packaging and evaluation requirements for both new and existing drums. In particular, implementing unified, technically robust evaluation criteria could improve the confidence in these drums as the key safety-class design feature in TA-54 Area G (site rep weekly 12/5/03).

Nuclear Material Stabilization: On Wednesday (5/26), the NNSA Site Office and LANL provided NNSA headquarters with a proposed implementation plan for Board Recommendations 94-1 and 00-1, as requested by the Board letter of 2/12/04. The proposed plan focuses on excess items. Most programmatic items are now being considered out of scope for 94-1. Instead, LANL intends to ensure safe packaging and storage of programmatic items via a separate comprehensive plan being developed in response to the TA-55 Type B investigation. That plan is expected in August. Safe storage of both programmatic and excess items would be addressed in parallel and within the same time frame.

The proposed 94-1 implementation plan is based on a revised risk assessment considering not only source-term but also chemical reactivity and package age. Compared to previously proposed plans, it increases emphasis on early disposition of non-weapons grade plutonium items and would achieve comparable risk reduction about 2 years sooner for these materials. One exception is large vessel clean-out, which may slip a year or more. The plan also identifies opportunities for acceleration for weapons grade plutonium that NNSA and LANL appear likely to pursue.

Plutonium Facility (TA-55): There may be an emergent need to evaluate TA-55 processes that were judged acceptable based on the current 1996-era safety basis and then were started up within the last few years, particularly whether they meet current DOE safety requirements. NNSA is reassessing the Pu-238 bench-scale aqueous recovery process based on this logic. NNSA and LANL have targeted completing, within the next few months, a re-review of the entire TA-55 safety basis proposed 2 years ago. Thorough, expeditious action to update this safety basis could address the emergent need.

TA-55 fire suppression is a safety-significant backup to the safety-class building confinement system. Several fire suppression surveillance frequencies in both the current and proposed safety bases differ from those in DOE requirements and guidance and the applicable code (NFPA-25). Some examples include the frequencies for verifying level in diesel day tanks, demonstrating that fire pumps auto-start within a pressure set-point range, and conducting sprinkler flow tests. In 1999, the NNSA Site Office approved an equivalency for less-frequent fire pump testing but with caveats indicating the decision should be revisited. The current safety basis review would appear to be the best time to revisit this and ensure that adequate technical justification exists for any deviations from codes and standards.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 4, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 4, 2004

Investigations and Trending: During the last two years, LANL has improved its investigations and trending of events reported under both the occurrence reporting system and the Price-Anderson program (the new sub-occurrence reporting system here still needs work). In early 2003, LANL analyzed about 1,400 occurrence reports filed during the previous 8 years, and they have continued to update these trend analyses. Some LANL observations from both last year and this year include: most of the correction actions taken are at the facility-level instead of the institutional-level; most actions taken are procedural changes; few corrective actions specify a new or modified engineered control; and even fewer actions make a substitution or otherwise eliminate the hazard. While LANL has taken some actions in response to these valuable studies, it appears more could be done take advantage of lessons learned across the lab, as illustrated by the lightning protection example below.

Lightning Protection: In August 2002 and again in August 2003, the Board raised questions about the functionality of the NFPA 780 lightning protection system for the Weapons Engineering Tritium Facility (WETF). NNSA has designated this system as safety-class. Several of the questions involved maintenance and configuration management of the system. The NNSA/LANL response (3/18/04) discusses actions taken since last Fall to inspect the WETF lightning protection system, correct deficiencies, and ensure proper maintenance.

In March 2004, LANL curtailed operations in the Radiography Facility (TA-8-23), and subsequently, NNSA formally suspended TA-8-23 operations involving explosive and tritium items due to lightning protection deficiencies and confusion on the safety basis (site rep weekly 4/16/04). Radiography of other items continued. Both the specific deficiencies and the institutional lapses that led to delay in correction are nearly identical to that experienced earlier by WETF. Before resuming the curtailed operations, LANL plans to conduct a readiness assessment, which will likely examine the institutional lapses. Since several LANL nuclear facilities rely on the lightning protection system to perform a safety function, LANL would be well-served to address these issues at an institutional level.

Waste Operations: NNSA and LANL are pursuing expedited shipment to WIPP of about 2,000 drums with the highest, most dispersable inventory. To resolve a bottleneck for this effort, LANL is installing a glovebox in the TA-54 Decontamination and Volume Reduction System (DVRS) facility and is proposing that DVRS be used for a 5-month campaign for visual examination and repackaging of transuranic waste containers.

DVRS is currently operating as a radiological facility. This will require it be approved for Hazard Category 2 nuclear operations. In early April, LANL prepared a limited-life Basis for Interim Operation (BIO) that discusses the hazards and controls. Accidents postulated include spills, fires, drum deflagrations, and earthquakes. Safety systems proposed include as safety class: the waste drums; the external building and internal enclosure (designed to PC-2 load criteria); active, filtered ventilation; backup power for ventilation; and fire suppression. The glovebox and its supports, exhaust, atmospheric controls, and drum lift are all proposed as safety significant. Key administrative controls proposed include: inventory and drum limits; vehicle and forklift prohibitions; external door controls; and prohibition on drum stacking. NNSA is reviewing the proposed limited-life BIO.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 11, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 11, 2004

Martin, Nichols, Von Holle, and White were here this week reviewing LANL support for Pantex.

Critical Experiments Facility (TA-18): The Board has identified issues that need to be addressed in the near term to ensure continued safe operations in TA-18 (Board letter 5/21/04). Most of these issues focus on ensuring adequate controls for critical experiments with plutonium (Pu) metal.

This week, NNSA concurred in a LANL path-forward for these issues. Specifically, LANL identified three high-priority experiments involving kg-quantities of plutonium that need to be conducted before operations transfer to DAF. Two of these require Pu metal. LANL will request NNSA approval of a set of safety basis controls for the 3 experiments. Beyond these experiments, LANL intends to avoid challenging the evaluation guidelines by proposing a 10 gm Pu metal limit. These are positive steps.

Plutonium Facility (TA-55): NNSA and LANL need to assign higher priority to completing the cleanup and recovery of the room contaminated with Pu-238 last August, as well as addressing the inadequate storage configuration for Pu-238 residues now in this room. Significant systematic progress was made early in the year, but decontamination efforts have slowed – particularly in the vicinity of containers of residues that are on the floor or in cages – because there is no approved path-forward yet for these containers. LANL has started to bag the containers in place and is close to conducting a management self-assessment for resuming residue pyrolysis operations. To make progress, they need a technically sound and approved set of safety basis controls for packaging, handling, and storage of the residues and for temporary storage of outer drums that would provide a secondary barrier to release for some packages. NNSA and LANL need to expedite the hazard analysis preparation, review, and approval cycle started more than 3 months ago for these operations.

Waste Operations: NNSA has approved the safety basis for using the TA-54 Decontamination and Volume Reduction System (DVRS) for 5 months for visual examination and repackaging transuranic waste containers. This will require verification and approval to start up DVRS as a Hazard Category 2 nuclear facility. The approved engineered controls are as discussed last week, plus lightning protection and a roll-up door restraint as safety-significant. NNSA imposed 3 conditions of approval (i.e., 5-month duration, inventory limit, and readiness verification) and 8 Technical Safety Requirement (TSR) changes. NNSA also questioned whether the structure meets Performance Category 2 seismic requirements. A LANL May 28th report indicates that DVRS is built on fill over old waste pits and needs site-response characterization; the internal enclosure is susceptible to seismic anchor motion; and the building lateral load path relies on tension-bracing, which does not meet current LANL detailing requirements. LANL is evaluating future use of DVRS beyond this campaign.

Annual Emergency Exercise: On Wednesday, LANL conducted a full exercise centered around TA-54. The scenario involved a simulated car accident with injuries; an unrelated hostage and bomb threat; and a simulated explosive attached to chlorine cylinders on a truck bed, leading to activation of the Emergency Operations Center (EOC). NNSA and LANL evaluators identified several areas for improvement, such as: EOC internal communications; response to victims; use of checklists, aids, and logs; and on-scene command-and-control. LANL is still adapting to the new EOC.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 18, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending June 18, 2004

Bamdad, Hadjian, Jones, Jordan, Kimball, and Rizzo (OE) were on site this week reviewing site-wide seismic design criteria; resolution of issues with the TA-18 safety-class flood retention structure; and the geotechnical characterization and the safety strategy for the CMR Replacement facility, which is under design. The Site Rep was off-site this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 25, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 25, 2004

Burns, Fortenberry, and Merritt were here this week for an overview of LANL operations.

Critical Experiments Facility (TA-18): NNSA and LANL will brief the Board on July 8th regarding the issues in the Board's May 21st letter. LANL has curtailed activity on the safety-class temperature-based scram systems because of the limited remaining life for TA-18 Security Category I/II activities (i.e., to 10/05). This increases reliance on administrative controls to prevent uncontrolled reactivity excursions. TA-18 has bounded the significance of this by restricting critical operations with more than 10 gm Pu to just 3 experiments (site rep weekly 6/11/04). LANL has committed to requesting NNSA approval in a new safety basis to continue two of the experiments and to conduct the third. However, LANL is continuing now with the two experiments in advance of requesting NNSA approval. While the experiments may be straight-forward, it seems that LANL should expeditiously identify to NNSA the administrative controls that are being depended on to fulfill the safety-class functions and the actions being taken to verify those controls are implemented and maintained.

Price Anderson Enforcement Letter: NNSA has sent LANL a preliminary notice of violation for the TA-55 Pu-238 uptake event (8/5/03), the TA-55 toxic vapor exposure event (9/27/03), and LANL radiological protection issues (site rep weekly 3/26/04). For the Pu-238 event, NNSA identified: two workers receiving exposures above the federal limit (5 Rem TEDE); inadequate work controls and failure to comply with those work controls that were in place; quality issues, particularly for the residue containers; safety basis violations, particularly for the seismic racks used to store containers; and radiological control deficiencies. The TA-55 toxic vapor exposure event resulted, in part, from some of the same work control issues. Due to the long-standing nature of some of the underlying problems, NNSA chose to escalate the severity level assigned to some of these violations (site rep weekly 7/11/03). NNSA expressed concerns with the history of known problems with the Pu-238 residue containers and with LANL assessment processes failing to identify these problems. NNSA observed that, while LANL has taken actions to improve work control and nuclear safety, there is still a long ways to go. NNSA expressed concerns on whether the compensatory measures put in place are sufficient to prevent significant safety events like the Pu-238 uptakes and encouraged LANL to take a fresh look at what needs to be done in the short-term to assure safe operations. From discussion with LANL management, they agree with the strong needs to continue to improve in these areas.

Radiography Facility (TA-8-23): On May 4th, TA-8-23 management found a screwdriver being used as a shim to maintain contact between a roll-up door and a micro-switch for a safety interlock. The need to shim the door may have been exacerbated by recent modifications to the underlying concrete pad. LANL critiqued the event and concluded that a breach in conduct of operations had occurred but not a safety basis violation. The event came to the attention of NNSA Site Office management last week as part of the review of a new safety basis to replace the current 2-year-old justification for continued operation (JCO). The JCO generically identifies X-ray machine safety interlocks as engineered safety features. NNSA concluded that the screwdriver constituted an unauthorized modification to a engineered safety system, resulting in a safety basis violation.

It's positive that TA-8-23 management responded to the jury-rigged interlock and initiated action; however, NNSA and LANL review of both the event and the subsequent response has raised questions at both the facility and institutional levels such as: the adequacy of training, the level of operators understanding of the safety basis, the formality of both nuclear safety systems management and the USQD process, and the adequacy of support by LANL institutional organizations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 2, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 2, 2004

Waste Operations: In November 2003, the NNSA Site Office approved with comment the upgraded safety basis for the TA-54 transuranic solid waste operations. Safety analyses of the postulated accident scenarios predict high consequences for several low probability events. LANL has limited available engineered controls; however, NNSA believes that shipping ~2,000 drums with the highest, most dispersible inventory would reduce risks by, at least, 70%. This is the Quick-to-WIPP Program. NNSA imposed a Safety Basis requirement that this program be completed by September 2004, although it has been acknowledged for several months now that this date is not supportable.

It now appears that the Quick-to-WIPP Program may not be completed until a year later – September 2005 – due to two factors: (1) LANL suspended WIPP shipments last October as a result of a finding during a Carlsbad Field Office annual audit, and while LANL has formally addressed the issues raised, the multi-agency process to approve resumption of shipments is not yet complete; (2) Last week, DOE corporately decided that Rocky Flats and Idaho shipments have priority over those from the other sites, including LANL. LANL had expected to resume WIPP shipments in the July-August time-frame, but it now looks like January 2005. LANL resumed full characterization this week and intends to have a backlog ready to go when shipments resume (site rep weeklies 10/3/03, 12/5/03, 2/2/04).

Plutonium Facility (TA-55): One of the more important safety basis admin controls for Pu-238 operations is ensuring that the material inventory within each unit operation stays below that assumed in the accident analyses (i.e., the material-at-risk assumption). The Pu-238 operations staff have begun verifying glovebox inventories every two weeks. During such a verification on June 15th, they determined that the inventory in one glovebox exceeded the material-at-risk limit by 10 % and corrected the discrepancy within an hour. Based on this event, TA-55 is considering further improvements in the material-at-risk controls proposed in the safety basis upgrade, now under review.

Critical Experiments Facility (TA-18): In May, LANL conducted a 3-day management self-assessment (MSA) of TA-18 operations (site rep weekly 5/7/04). The MSA report discusses the strong sense of pride, ownership, and accountability at TA-18, but mentions that personnel are concerned about: high levels of stress and anxiety, increasing programmatic pressure, and programmatic schedules and security requirements sometimes being prioritized over safety.

The MSA team made several recommendations including developing formal plans for program continuity that will maintain mission capability; developing a staffing plan that realistically establishes a path forward for TA-18 personnel; addressing the high level of distraction that is causing less management focus on day-to-day operational issues; addressing several training needs including formal job task analyses for key operations managers and in-depth training for all operators on safety basis accidents and controls; fully implementing new LANL-wide work control measures; and improving relationships with oversight organizations. The report includes a summary of the corrective actions planned; however, it appears that more ought to be done based on the team's findings (e.g., staffing analysis, training, management walk-around) and that ownership of the corrective actions ought to be assigned at the responsible division level or above. The site rep believes that, while many TA-18 management systems are working, the report validates concerns expressed in the Board's May 21st letter.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 9, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 9, 2004

Waste Operations: LANL solid waste operations (TA-54 Area G) suspended receipt of on-site waste last Wednesday when it was discovered that the total above-ground transuranic (TRU) waste inventory was about 56 % higher than expected and about 7 % higher than in the new approved safety basis, which is still to be implemented. The discovery was made when LANL started up a real-time inventory tracking system developed to ensure compliance with the new safety basis. To permit resumption, NNSA has approved a safety basis change to increase the inventory limit. NNSA continues to emphasize the importance of achieving the Area G risk reduction from the Quick-to-WIPP program. As reported last week, no LANL WIPP shipments are scheduled until Jan 2005, and the Quick-to-WIPP program is now not expected to be completed until Sep 2005. LANL does intend to take advantage of earlier shipment opportunities that may arise if there are delays at other sites.

Training: NNSA is assessing training at NNSA sites, including LANL, in response to a Board letter (7/9/03). The NNSA team has finished reviewing documentation implementing LANL nuclear facility training programs and has concluded that LANL could not demonstrate that a formal process is in place to ensure personnel meet minimum qualification requirements in the applicable DOE Order (5480.20A). NNSA has requested LANL provide a resource-loaded corrective action plan within 60 days. The assessment focused on facility-specific program descriptions and implementing documents. The review identified several systemic issues such as facility programs that are in place are expert-based rather than standards-based; LANL has not documented justification for concluding that some DOE training requirements are not applicable; Training Implementation Matrices are out-of-date; and programmatic weaknesses exist in instructor qualification, continuing training, and training and qualification for facility support personnel. The findings resonate with previous LANL assessments (site rep weekly 1/23/04). NNSA is starting performance-based assessments this month. Sufficient data appears available now to identify priority training improvements that could enhance safety.

Vital Safety Systems (VSS): LANL Audits and Assessments recently reported their findings from evaluating operation and maintenance of about one-third of the VSS at LANL, distributed among 8 LANL nuclear facilities. They found that an institutional plan to implement relevant requirements in the DOE Facility Safety order (O 420.1A) was not submitted to NNSA, as required; many VSS have inaccurate drawings; about half the corrective actions from previous assessments (e.g., 00-2 Phase IIs) are overdue, on average by hundreds of days; and lack of budget and low priority resulted in the VSS program not meeting expectations. LANL is walking down VSS and redlining drawings. LANL is also preparing an implementation plan for DOE O 420.1A as a result of a Board letter (1/27/04). If it is resource-loaded, this plan could provide a framework for addressing these important issues.

Weapons Engineering Tritium Facility (WETF): Many of the findings during the recent NNSA Operational Readiness Review (ORR) at WETF are institutional in nature (site rep weekly 5/7/04). About one-third of the post-start findings involve training and are related to issues discussed above. Several other findings involve configuration management, the master equipment list, system design descriptions, and the maintenance implementation plan, related to VSS issues discussed above. The most challenging pre-start finding involves the adequacy of information for verifying and validating operability of safety systems based on functional and acceptance testing requirements in applicable codes and standards. This finding is probably also applicable to other LANL nuclear facilities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 16, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 16, 2004

Matthews, Jordan, and Burns were here this week reviewing operations.

Management: On Friday, the LANL Director suspended all but essential operations as a result of recent significant safety and security events. By memo, he directed all LANL organizations to perform a point-to-point risk assessment of day-to-day activities. The duration of the suspension will depend on the formalities, complexities, and risks identified in each part of the lab's operations. LANL expects a staggered restart with some low-risk operations resuming quickly. The NNSA Site Office is working with LANL senior management to assess the risk group-by-group of resuming operations.

Integrated Safety Management (ISM): On Wednesday, a student received an eye injury while working under supervision with a laser in a non-nuclear facility. The event is under investigation and has implications for work control both in nuclear and non-nuclear facilities (site rep weekly 5/7/04). LANL has begun to take institutional actions in response to this event.

Training: LANL senior management is engaged in addressing the institutional training issues discussed last week and expects to have an integrated, resource-loaded corrective action plan by the end of August, as requested by the NNSA Site Office. LANL resources committed to training dropped by half between 1994 and 2002 and have since remained steady; training had become largely decentralized, expert-based, and poorly documented. Management attention is now increasing. While it will take time to fix, improving training may provide an opportunity to increase management and worker awareness and compliance with policies and procedures involving safety and security.

Critical Experiments Facility (TA-18): Last Friday, TA-18 curtailed all operations involving nuclear material on critical assemblies. They also curtailed nearly all operations involving accountable quantities of nuclear material, including movements. Operations involving Technical Safety Requirement (TSR) surveillance, the early material move, and sub-accountable quantities (e.g., check-sources) were allowed to continue under increased management attention (e.g., direct division-level management supervision of early move activities).

LANL management directed the curtailment after TA-18 discovered a TSR violation. Specifically, a material custodian failed to verify the material-at-risk (MAR) inventory in a shed before introducing a powder-form item. Furthermore, the safety basis prohibits powder-form MAR being stored in the shed; TA-18 did not comply with all the actions required in an LCO for when MAR is exceeded. LANL review of the event identified weaknesses in operator training and qualification related to compliance with admin controls and in operations management when key personnel are absent.

The admin controls violated here have no apparent direct role in preventing the reactivity excursion accident discussed in the Board's May 21st letter; however, the weaknesses found reinforce the concerns raised by the Board – the high reliance on admin controls, on operator training and qualification, and on operations management in preventing an accident with significant off-site consequences. The site rep understands that LANL will address the Board's issues in the resumption plan being prepared.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 23, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 23, 2004

LANL Shutdown: All but essential operations are shutdown, as discussed last week. The Secretary of Energy has stated that federal concurrence will be necessary if LANL is to resume operations with significant safety implications. LANL management has categorized all work activities into one of three risk levels: (1) little or acceptable risk (e.g., office work); (2) mid-range risk (e.g., light lab, routine industrial activities); and (3) higher risk (e.g., higher hazard non-nuclear and nuclear activities, certain security activities). LANL has a resumption plan in place for the level 1 activities, which emphasizes personnel behavior and compliance, human error prevention, and management interaction and accountability. Criteria for level 2 and 3 resumptions are still in development. Resumptions will be staggered and occur at the group or activity level.

During the last few years, LANL has improved several processes that will likely have a key role in verification and resumption of higher risk activities, including: (1) In late 2002, LANL issued updated procedures for formal readiness verifications before startups and restarts; subsequently, LANL facilities have trained and begun using these procedures, improving the rigor of verifications. (2) In late 2003, LANL issued a single integrated work control process. Since then, LANL has persisted in further improving work planning, hazard analysis, and work control; recent safety-related work control deficiencies appear due more to compliance issues than process issues. (3) LANL has started to make improvements in the management walk-around (MWA) process; an effectively implemented MWA process could enhance communicating expectations and improving behavior.

Four areas with nuclear safety implications that warrant close scrutiny during this stand-down are: (1) continuing safety system surveillance and maintenance (e.g., TSRs); (2) continuing essential waste operations, particularly managing the current TA-55 backlog and resuming activities that are part of the Quick-to-WIPP Program; (3) completing cleanup and recovery of the room in TA-55 contaminated with Pu-238 last August; and (4) moving forward on nuclear material stabilization activities (e.g., Board Recommendation 94-1 actions). At this time, NNSA and LANL appear to be applying appropriate emphasis to all these areas – except possibly the TA-55 contaminated room cleanup, which was lagging even before the stand-down (site rep weekly 6/11/04).

Plutonium Facility (TA-55): TA-55 reported on Monday that a TSR monthly surveillance of the fire suppression control valve lineup had been inadvertently performed two days late. TA-55 operations management is improving the sequencing of this maintenance to prevent recurrence.

Transportation: The currently approved safety basis for the Chemistry and Metallurgy Research Building (CMR) assumes no high explosive (HE) shipments and limited diesel fuel shipments occur near CMR. In May, CMR declared a potentially inadequate safety analysis (PISA) because there were no controls in place to protect these assumptions and, in fact, such shipments were occurring. On June 3rd, LANL proposed to NNSA both interim admin controls for restricting and rerouting such shipments and longer-term safety basis changes. NNSA action is pending. This week, LANL reported that 15 HE shipments had been made near CMR between mid-May and end of June, indicating that both CMR and the on-site transportation group had not implemented the interim controls. LANL is taking action to implement these controls.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 30, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 30, 2004

Burnfield was on site this week observing an NNSA assessment of LANL internal dosimetry. The assessment results are forthcoming (site rep weekly 5/21/04).

LANL Resumption Status: LANL resumed some low risk (i.e., level 1) activities this week. All but essential operations were suspended on July 16th. NNSA and LANL management are updating the risk characterization criteria and placing risk characterization under change control. They are converging but have not finalized verification and resumption criteria for moderate and higher risk activities (levels 2 and 3). LANL has established the COMPASS project to guide the resumption effort by using project management tools to monitor indicators and prioritize distribution of institutional resources. COMPASS stands for Culture and Operations Model Plan and Surety System. The work force is moving from a 9-day/80-hr to 5-day/40-hr schedule to support resumption. LANL management is the restart authority for activities not involving classified removable electronic media.

The NNSA Site Office continues to work on an oversight management plan, which will define federal activities required for concurrence in resumption of higher risk activities. The Site Office plans to request outside federal assistance, as appropriate, after the plan is developed. Currently, the Site Office and DOE Office of Assessment (DOE-OA) are coordinating an upcoming DOE-OA team visit that will focus on select LANL activities, including TA-55.

Plutonium Facility (TA-55): TA-55 has instituted daily inspection tours by cognizant personnel of facility spaces and programmatic equipment. Discrepancies are being repaired when found (e.g. some glove change-outs). TA-55 has also reviewed their work orders and is completing essential periodic maintenance using the integrated work control process. There is programmatic pressure to ship plutonium oxide for mixed oxide (MOX) fuel lead test assemblies. TA-55 expects shortly to resume preparing hazard analyses to support finishing cleanup of the Pu-238 contaminated room.

Chemistry and Metallurgy Research Building (CMR): CMR has issued a standing order to continue essential facility activities, which include surveillance rounds, fire alarm and suppression tests, transient combustible inspection, material-at-risk admin controls, ventilation inspection, etc. Cognizant programmatic personnel began inspections of lab spaces this week. CMR has some solid samples in process that appear stable and some liquid residues (tens of liters) that need disposition.

Radioactive Liquid Waste Treatment Facility (RLWTF): RLWTF has continued to receive low-activity waste streams and resumed some low-level treatment processes and controlled discharges this week. The facility has questioned resumption of transuranic (TRU) waste treatment, which could impact TA-55. The TRU waste streams are stored, neutralized, clarified, precipitated, and cemented via a batch process. The clarifier (CL-1) is a rectangular carbon steel tank that has been in continuous service for longer than 2 decades. Facility management has identified external pitting and corrosion at the bottom of CL-1 along two sides converging at a corner. Internal condition is unknown. CL-1 may have experienced accelerated corrosion in the last year due to higher salt concentration and the collection of moisture during cooling of waste. The room has a berm to contain any leakage, but cleaning up after a leak would be radiologically challenging. Repair or replacement also looks difficult. More time to address the issue could be gained by expediting replacement of the leaking caustic waste receipt tank, but progress on replacement has been glacial (site rep weekly 10/24/03).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 6, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 6, 2004

Andrews and Nichols were here this week reviewing resumption and safety basis activities.

LANL Resumption Status: LANL has divided resumption of low-risk activities (i.e., risk level 1) into 348 projects and resumed about 80 % of these as of Friday morning; several nuclear facilities have not yet achieved level 1 resumption. Both the NNSA Los Alamos Site Office (LASO) oversight plan and the LANL resumption plan have been approved and issued. The LANL plan defines the process for verifying functional and organizational readiness to resume moderate and high hazard work (risk levels 2 and 3). The plan is based on LANL institutional startup/restart requirements, which were derived from DOE Order 425.1, *Startup and Restart of Nuclear Facilities*.

LANL plans to verify moderate risk activities through management self-assessments (MSAs); higher risk activities will receive both MSAs and lab readiness assessments (RAs). The assessments will focus on management competence, personnel behavior; work control (ISM); training and qualification; security; environmental protection; facilities/infrastructure; and authorization basis. LANL management will separately assess personnel culture by one-on-one interviews. To ensure quality and consistency, line management and assessment teams are receiving RA-focused training, and LASO and the LANL Performance Surety Division (which has institutional responsibility for the RA process) will have representatives on each assessment team. LANL infrastructure (e.g., health and safety, on-site transportation, waste operations) have priority for early assessments.

Before each assessment, its scope will be reviewed by the LANL Resumption Review Board (RRB) and approved by the LANL Director and LASO. After each assessment, the RRB will review and concur in the team's findings, as well as line management's resource-loaded corrective action plan and recommendation to proceed. A new Issue Review Board, which has authority to prioritize lab-wide resources, will increase focus on managing the findings and issues. The LASO Manager will separately concur in resumption based on input from his representatives on each assessment team and on the RRB. The LANL Director is the approval authority for resumption for non-CREM activities.

Plutonium Facility (TA-55): This week, LASO approved a safety analysis for packaging 39 seal-welded cans of Pu-oxide into 8 DOT Type B shipping containers and approved with DOE-EH concurrence an exemption from DOE readiness verification requirements (DOE O 425.1) for this activity. Four or five cans will be slipped into an inner shipping container that will then be rotated to vertical, mechanically capped, and slipped into an outer over-pack. The operation will be done using a reader-worker approach under senior supervisory watch. It requires 2 lifts of the loaded inner container, which will be controlled as critical lifts. NNSA pursued the exemption to support the MOX Program schedule and was not specific on which DOE O 425.1 requirements were waived. This type of operation would normally have had an MSA and an RA. LANL is performing a formal, rigorous verification. NNSA and LANL senior managers are walking down the process. LANL may load the first shipping container next Thursday.

Authorization Basis (AB): There is no discernible improvement in the AB preparation/review process since the staff's review last Oct or as a result of the Board's May 27th letter. LASO attributes previous issues to LANL lack of compliance with existing requirements and to insufficient federal resources. Better balanced priorities and a planned, resource-loaded, well-executed improvement effort are needed.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 13, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 13, 2004

LANL Resumption Status: LANL has divided resumption of low-risk activities into 348 projects and resumed about 97 % of these as of Friday morning. LANL has also trained more than 800 people on the readiness verification process for resuming moderate and higher hazard activities (i.e., risk levels 2 and 3). The resumption process is as described last week. NNSA Site Office (LASO) oversight is being temporarily supplemented by a team from the DOE Office of Assessment (DOE-OA).

On Thursday, the LANL Resumption Review Board (RRB) began reviewing startup notification reports (SNRs), which define the activities to review for resumption, the review team constitution, the criteria, and the approach. At this time, LANL anticipates 33 management self assessments (MSAs) on level 2 and 3 activities, followed by 12 readiness assessments (RAs) of level 3 activities. As an example, TA-55 and CMR plan to present their first SNR to the RRB on Monday. It will cover nuclear infrastructure, including cleanup of the room contaminated with Pu-238 last August – a high priority. This will be followed by two other MSAs covering nuclear programs and Pu-238 operations.

A few of the challenges are (1) the large scope of some of these assessments, which will require smart sampling; (2) ensuring that all LANL moderate and higher hazard activities are captured within an appropriate assessment; and (3) achieving proper balance between timeliness to resuming national security programs and sufficient assurance that the safety/security/compliance objectives have been met. For example, each nuclear activity will be assessed against 53 individual criteria; a facility like TA-55 will have dozens of processes/activities that need to be assessed against each of these criterion, resulting in thousands of point-assessments. NNSA and LANL management are emphasizing assessments that are both thorough and timely. There is awareness that an overly-extended shutdown of nuclear operations can create new safety issues, such as those experienced at some DOE sites in the early 1990s, and that many issues found will need to be addressed on a timely basis after resumption.

Plutonium Facility: This week, LANL continued their accelerated preparations for loading shipping containers with seal-welded cans of plutonium oxide to support the MOX program. LANL has divided the operation into two parts: (1) loading/staging the shipping containers and (2) moving shipping containers to the transport. Readiness verification of the first part has been rigorous and will likely complete today after a final demonstration. There is a question on the safety-class pedigree of the seal-welded cans to withstand the full fire. These are STD-3013 inner cans of the ARIES design. Loading operations may begin early next week, pending resolution of the few remaining open items.

Authorization Basis (AB): Annual updates of nuclear facility ABs have rarely occurred here, and neither LANL nor LASO maintains a complete list of AB documents (site rep weekly 4/23/04). To rectify this, the LANL resumption plan includes a requirement that nuclear facilities have an approved authorization agreement (AA) in place prior to resuming level 3 activities. The AA will include a list of the documents that constitute the AB. Three months ago, LANL proposed to LASO a procedure that could streamline the process of preparing and updating AAs. The site rep understands that this procedure is still waiting action because of confusion on hazard categorization (HC) for some nuclear facilities (e.g., whether the Radioactive Liquid Waste Treatment Facility is now HC-2 or HC-3). Prompt LASO action on both the AA procedure and facility hazard categorization would be beneficial to support resumption activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 20, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 20, 2004

The Board and a staff team were on site this week reviewing resumption planning and status.

LANL Resumption Status: LANL has resumed all the low-risk activities (i.e., level 1). At this time, it's anticipated that there will be 43 management self-assessments (MSAs) for the moderate and higher risk activities (i.e., levels 2 and 3, respectively), followed by 16 to 18 LANL readiness assessments (RAs) for level 3's. As of Friday morning, the LANL Resumption Review Board (RRB) had approved 30 of 43 MSA startup notification reports, which establish the scope, team composition, and sampling for the MSAs. All LANL nuclear operations are now cleared to begin their MSAs, except LANSCE and TA-18. MSAs are expected to take 2 to 4 weeks. Several have started.

Plutonium Facility: This week, LANL began the accelerated campaign to load shipping containers with seal-welded cans of plutonium oxide to support the MOX program. LANL has reviewed analysis, testing, and manufacturing of the cans and confirmed that they meet safety-class pedigree.

Recommendations 94-1/00-1: LANL nuclear material stabilization activities are being impacted by the stand-down and warrant priority upon resumption to reduce risk. Also, NNSA rejected last week the LANL proposed process hazard analysis for the large vessel cleanout operation (site rep weekly 2/6/09). Impacts of both on the Secretary's proposed implementation plan are to be determined. Separately, the DOE Inspector General Office reported this week on its review of LANL stabilization activities and observed that multi-year delays have occurred because: the program was underfunded between 1997 and 2002; LANL has not made full use of project management tools; and NNSA has not incorporated incentives into the LANL contract. NNSA has generally agreed with the findings.

Authorization Basis (AB): In a letter and staff report (5/27/04), the Board observed that NNSA has not enforced the annual update requirements for LANL safety bases; that several nuclear facilities (e.g., TA-55) are operating now with safety bases that are 5 to 8 years old; that NNSA has established that the lack of current AB container requirements contributed to the TA-55 Pu-238 uptakes last August; and that more balanced priorities would be beneficial in improving facility safety bases.

NNSA and LANL acknowledge that there are significant quality and timeliness issues in the AB preparation and review process, resulting in a large backlog. To address quality, LANL intends to: establish a centralized safety basis management office; develop a new safety analyst qual standard; assign a safety analyst to the NNSA Site Office (LASO) for cross-training; pilot improved training for safety analysts; develop safety basis training for line managers; and set up an Unreviewed Safety Question (USQ) back-look program. The last is in response to a recent LASO observation that there has been a series of USQs declared as negative that should have been positive.

To address timeliness, LASO has initiated a high-priority risk management plan; arranged for support from 3 qualified headquarters analysts; hired 2 new but not yet qualified analysts and requested 4 more slots; issued a support contract to cover some document reviews; supported the LANL safety basis academy's development. LASO and LANL have also teamed to review and rework the TA-55 AB upgrade proposed in April 2002. This effort has been impacted by the stand-down and by support required for the accelerated MOX shipment; LANL believes it might be completed in October. Overall, the NNSA and LANL efforts are expected to be responsive to the Board letter.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 27, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 27, 2004

Tom Burns reported for duty here this week as a DNFSB site representative. Also this week, a site rep discussed observations on resumption activities with the University of California ES&H Panel, which was here conducting an on-site review.

LANL Resumption Status: LANL is progressing on overall resumption and will likely resume some moderate-risk non-nuclear operations early next week. Nearly all nuclear facilities have begun their management self-assessments (MSAs); LANSCE and TA-18 are conducting MSAs for their moderate risk activities (i.e., Level 2) and have yet to propose the MSA scope for their higher risk activities (i.e., Level 3). Most nuclear MSAs are expected to be done in mid-September and to be followed by a multi-week lab readiness assessment (LRA). Schedules are fluid. Barring major pre-start findings, nuclear facilities might individually resume operations in October or November, 3 to 4 months after the stand-down.

Integrated Safety Management (ISM): An apparent breakdown in the LANL interim work control process played a major role in the LANL management decision to stand down the lab (site rep weekly 7/16/04); therefore, the site reps have been closely monitoring MSA evaluations of ISM. Preliminary indications are that the interim work control process is incompletely or inconsistently implemented in many nuclear and non-nuclear facilities. Furthermore, while an improvement over that of a year ago, the interim process still needs work; LANL recognized this before the stand-down, but anticipated improvements have been delayed by the stand-down. The assessments should provide useful feedback in improving the process. Identifying and fully implementing these improvements warrants priority.

Authorization Basis (AB): Last week, LANL revised its operations requirements (LIR 300-00-03.1) to improve the process for updating and maintaining Authorization Agreements (AAs). The AAs list the AB documents that support NNSA's decision to allow a nuclear or high hazard facility to operate. Most LANL AAs are out-of-date and are expected to be updated as part of the resumption process.

Critical Experiments Facility (TA-18): In a letter dated 5/21/04, the Board identified issues that need to be addressed near-term to ensure continued safe operations in TA-18. Most of these issues focus on ensuring adequate controls for critical experiments with plutonium metal. On July 9th, TA-18 curtailed nearly all operations including those for critical assemblies (site rep weekly 7/16/04).

Last week, LANL provided the status: LANL has tentatively identified 11 engineered controls and 16 administrative controls that play a role in managing the risk of reactivity insertion accidents for the 5 critical assemblies; LANL intends to recommend to NNSA discontinuing implementation of the principal engineered control - the in-core temperature monitoring system (ITMS); LANL will review both the risks and controls as part of the Level 3 resumption process during the next few months. These actions are expected to be responsive to the Board's 5/21/04 letter. NNSA still needs to respond next month to a reporting requirement on ITMS from an earlier Board letter (7/9/03).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 3, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 3, 2004

Management: The New Mexico Environmental Department (NMED) has released for 30-day public comment a proposed, legally-enforceable consent order for LANL cleanup by 2015. The consent order arose from 2 years of negotiations, stemming from an NMED draft order issued in May 2002.

Resumption Status: LANL has binned the remaining resumption effort into 26 moderate-risk (Level-2) and 15 higher-risk (Level-3) activities. LANL has resumed none of the Level-3 and three of the Level-2 activities, mainly classified computing and some non-nuclear light-lab work. The Resumption Review Board (RRB) is now reviewing management self-assessment (MSA) reports for 7 more Level-2 activities, including limited TA-18 work. Schedule pressure on the MSA teams and the RRB is intense. That said, MSA teams are generally doing a thorough job identifying issues, and RRB feedback has led some MSA teams to revise and improve their reports. LANL expects the first four Level-3 readiness assessments (RAs) for nuclear activities to begin the week of 9/13 and to cover the tritium facility (WETF), radiography facility, waste and characterization operations, and packaging and transportation. Schedules are still fluid, and several RA schedules appear overly optimistic.

Integrated Safety Management: LANL continues to actively refine its draft integrated work management procedure, intended to replace the current interim process, and expects to issue the final procedure and begin training and implementation within a couple of months, at earliest. Most resumption MSAs should be done by then. LANL anticipates that these MSAs will confirm that the work control issues are due more to incomplete implementation than to the process; however, the final procedure and its implementation can be adjusted if the MSA results indicate otherwise.

Los Alamos Neutron Science Center (LANSCE): LANSCE has released its investigation report on two workers who discovered last March that they were working in an uncontrolled, unrecognized high radiation area and exited (site rep weekly 3/12/04). The report identifies inadequate implementation of work control as the root cause, and that lessons learned from similar previous events had not been incorporated. LANL is pursuing corrective actions, including evaluating engineered controls.

NNSA and LANL are considering re-categorizing LANSCE Lujan Center and 1L Target activities from Level-3 to Level-2, which would reduce the institutional scrutiny before resumption. While LANSCE management has been responsive to safety issues, LANSCE appears to also have many of the same risk indicators as other activities ranked at Level-3 (e.g., multiple tenants and customers; recent accidents or near-misses; and full range of hazards- radiological, electrical, high explosive). LANSCE would be the only LANL nuclear facility that does not receive the institutional scrutiny from a Level 3 RA. It is not intuitively obvious that this re-categorization is appropriate.

Plutonium Facility (TA-55): On Wednesday, TA-55 dropped an empty Type B shipping container while removing it from a shipping cradle. Operators properly stopped work. Damage was superficial. The operators had just dry-run placement of the container horizontally onto the cradle as part of a verification to support the MOX program (site rep weekly 8/13/04). The forklift operator then lifted the container and may have inadvertently released it when he intended instead to rotate it to vertical, due possibly to equipment failure. TA-55 found that the collocation of certain forklift controls increased potential for dropping the container (i.e., positive USQ) and is modifying the forklift.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 10, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 10, 2004

LANL Resumption Status: Schedules for the 9 or 10 LANL readiness assessments (LRAs) for higher-risk nuclear activities (Level 3) are slipping, and none are likely to begin next week. Schedules are still fluid; LANL is starting to plan on LRAs being about 3 weeks long, which is more consistent with the management self assessment (MSA) durations. LANL has resumed 6 of the 26 groups of moderate-risk activities (i.e., Level 2) and is close to authorizing resumption of another 6 (i.e., total 46%). This includes light labs, shops, classified computing, and limited TA-18 operations.

Quality of the Level 2 MSAs completed to date appears mixed; several MSA reports have been revised several times based on feedback from the LANL Resumption Review Board. Lessons learned are being fed back to the on-going MSAs to improve quality. The sequence of resumption is also starting to receive consideration; specifically, certain security, waste management, and health and safety operations need to start before most programmatic work. Developing and implementing a well-conceived sequence of resumption continues to warrant attention.

At this time, LANL has a plan but does not yet appear to have in place a systematic approach for managing and analyzing the issues being reported. Based on cursory analysis, many of these issues involve work control, training and qualification, and equipment and infrastructure. NNSA and LANL are acting on preliminary indicators of problems. For example, NNSA has directed LANL to establish an unreviewed safety question (USQ) review team because of USQ process issues. LANL has also proposed conducting a special cross-cutting LRA focused on the facility-program interface and the accountability for equipment maintenance because of the issues already identified in these areas.

Critical Experiments Facility (TA-18): TA-18 has completed a Level 2 MSA and been authorized to resume activities involving security category III/IV material. To address pre-start findings, TA-18 needs to receive the LANL Director's approval of a restart plan for resolving issues on control of material-at-risk. These issues led LANL to shutdown TA-18 operations on July 9th (site rep weekly 7/16/04). Once that plan is approved and closure verified, TA-18 intends to start packaging security category III/IV material for the first shipments to the Nevada Test Site Device Assembly Facility.

Los Alamos Neutron Science Center (LANSCE): The 1L Target operations and Lujan Center user programs at the LANSCE facility have been re-categorized from Level 3 to Level 2 (site rep weekly, 9/3/2004). Re-categorization of the 1L Target operations appears appropriate given the rigor of the redundant engineered controls that prevent the dominant accident scenario (i.e., tungsten target oxidation and dispersal). LANL documentation supporting re-categorization of the Lujan Center programs indicates that the hazards are commensurate with the Level 2 criteria; however, recent work control issues may warrant further institutional scrutiny.

Authorization Basis: LANL has proposed and NNSA has accepted an updated LANL nuclear facility list. Principal changes are: the TA-21 tritium facility (TSFF) has been down-rated to Hazard Category 3 (HC-3) for 3 years in preparation for D&D; the TA-50 Radioactive Liquid Waste Treatment Facility has been elevated to HC-2, although the supporting analysis has not been submitted; and the TA-54 Decontamination and Volume Reduction System (DVRS) has been elevated to a HC-2 for a 5 month period that starts when DVRS is released to perform TRU waste visual examination and repackaging.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 17, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 17, 2004

Nichols was here this week supplementing site rep coverage of LANL resumption activities.

Integrated Safety Management (ISM): LANL has released its investigation report on the laser-induced eye injury that occurred in a non-nuclear facility (site rep weekly 7/16/2004). The report identifies the primary causes as inadequate work control and non-compliance with safety requirements. The uncertainty introduced by the behavior aspect of this event contributed to LANL management's decision to shutdown operations, along with recognition that such behavior negates the integrated work management improvements that LANL has invested heavily in making during the last year (site rep weeklies 5/7/04, 10/17/03, 9/12/03). LANL is committed to implementing an improved work control process within the next few months.

LANL Resumption Status: Schedules for the 9 LANL readiness reviews (LRRs) for higher-risk nuclear activities (Level-3) continue to slip. TA-55 and CMR will likely be the first nuclear facilities to have LRRs. These will likely begin the week of Sep 27th and could be quickly followed by LRRs for the other nuclear operations. LANL's most optimistic estimate for finishing all 19 nuclear and non-nuclear LRRs is end of October and assumes the following: the management self-assessments (MSAs) were high quality; the MSAs identified a manageable list of issues; few new issues are found by the LRRs; and some LRR assessment activities can be paralleled.

Overall, most Level 3 MSAs have slipped because of evolving expectations and the experience-level of many MSA team members. Most MSA reports are expected into the Resumption Review Board (RRB) during the next two weeks. This will probably saturate the RRB, which continues to be the primary means by which LANL is ensuring uniform quality and consistency in the reviews. The shortest pathway to safe resumption requires the RRB to continue to thoroughly review these MSA reports and ensure that the MSAs were comprehensive in scope and identification of issues.

Because of mounting schedule pressure, NNSA and LANL intend to reduce the scope of the LRRs. Compared to the MSAs, the LRRs will focus more on management competency, personnel behavior, and integrated safety management. Breakdowns in these specific areas directly led to the decision to shutdown. The LRRs will also focus on validating issues identified during the MSAs. However, counter to standard practice for readiness assessments, the LRRs will not explore MSA conclusions in areas that the MSA teams deemed acceptable unless an LRR team discovers a new issue, which the LRR team will then pursue. NNSA and LANL are accepting the reduced scope because of the robust RRB review process and because of a degree of independence introduced into the MSA process by involvement of federal and LANL Performance Surety Division staff.

Training: NNSA is assessing training at its sites in response to a Board letter (7/9/03). NNSA intends to conduct its performance-based assessment at LANL as part of the LRRs. LANL is also preparing a corrective action plan in response to an earlier NNSA assessment (site rep weeklies 7/9/04, 7/16/04).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 24, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: T. D. Burns Jr. and C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending September 24, 2004

Nichols was here this week supplementing site rep coverage of LANL resumption activities.

Resumption Status: Next week, LANL may start 3 or 4 of the 9 lab readiness reviews (LRRs) anticipated for nuclear facilities. The Resumption Review Board (RRB) has approved starting the Weapons Engineering Tritium Facility LRR and is reviewing the 3 management self-assessment reports for the CMR Building and the Plutonium Facility, including Pu-238 operations. LANL also revised its resumption plan this week. The changes include simplifying the classification-of-findings criteria. A condition of imminent danger, a violation of requirement indicating unknown or unanalyzed risk, or a newly discovered issue that would have stopped work before the stand-down are considered as potential pre-start findings. Such findings are required to have compensatory measures in place, and these are required to be verified by senior management before acceptance by the RRB.

Integrated Safety Management (ISM): LANL has issued an updated integrated work management process and plans to implement it by June 2005. Activities with new, deficient, or missing work control documents are expected to implement it by end of November. This action is responsive to the Board's letter of 9/13/04, which suggested LANL fully and aggressively pursue an improved process in parallel with resumption. Some changes in the process include increased emphasis on worker involvement and management accountability, particularly at the group level; a simplified, site-wide grading logic similar to that used for the resumption process; a job hazard analysis tool/database; clear subject matter expert involvement; and required training. As part of the resumption review process, NNSA has also informally observed that LANL facilities with some maturity in formality of operations have tended to demonstrate effective integrated work management. This week, LANL issued a Conduct of Operations Manual and institutional requirements long in development. LANL has committed to have demonstrable compliance with the applicable DOE order by September 2005.

Authorization Basis (AB): LANL has reported certification issues with sealed sources in two radiological facilities and has placed the sources in robust safes as a compensatory measure. LANL raised the issues after NNSA inquiries into the certification at another facility, including questions on source size, age, and compliance with current requirements (ANSI N43.6-1997). In April 2000, NNSA and LANL credited sealed-source certification and down-rated these facilities to radiological status. Considering the inventory without a certification exemption, these facilities appear equivalent to nuclear facilities (e.g., Hazard Category 2 or 3), and valid certification would appear equivalent to a safety-class or safety-significant requirement. Overall, NNSA and LANL may be well-served to periodically reevaluate the surveillances performed and the bases for acceptance of LANL radiological facilities.

Unreviewed Safety Questions (USQ): NNSA and LANL have identified issues with the LANL USQ process (site rep weekly 8/20/04). The DOE performance assurance office (DOE-OA) has also asserted that the applicable DOE guide is not compliant with the Nuclear Safety Rule (10 CFR 830) and consequently the LANL USQ process is not consistent with the Rule. LANL is revising its USQ process to address these issues. This is being done expeditiously to support the resumption process.

Tritium Facilities: As part of resumption reviews, LANL has identified AB compliance issues in TA-21 (TSFF). LANL intends to reduce TSFF's inventory and propose downgrading it to radiological status. TSFF will likely continue neutron tube target loading until after WETF starts up those operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 1, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 1, 2004

Keilers was at DNFSB-Headquarters in Washington D.C. Monday through Wednesday. Jordan and Burnfield were on-site this week augmenting site-rep coverage of resumption activities.

Resumption Status: Field work for the Weapons Engineering Tritium Facility (WETF) lab readiness review (LRR) is complete. The LANL Resumption Review Board (RRB) is currently reviewing management self-assessment (MSA) reports for TA-55 (including Pu-238 operations), CMR, LANSCE, the TA-8-23 radiography facility, the site services contractor (KSL), and moderate-risk TA-50 and TA-54 waste operations (including WIPP drum characterization). Pending RRB concurrence, LRRs for some of these activities – particularly TA-55 and CMR – may begin next week.

Critical Experiments Facility (TA-18): LANL has reported closure of the material-at-risk issues that led to the pause in most TA-18 operations on July 9th (site rep weekly, 7/16/2004). TA-18 has resumed handling Security Category III/IV material and is conducting an MSA for operations involving critical experiments and Security Category I/II materials. On Wednesday, TA-18 made its first shipment of nuclear material to the Nevada Test Site Device Assembly Facility. This shipment consisted of Category III/IV material. The evolution was not without incident. While entering TA-18, the transport truck severed a low-hanging low-voltage overhead line that was not installed to the proper height. Future shipments will require spotters to ensure adequate clearance until the facility raises the low-hanging lines. Lessons-learned will be promulgated lab-wide.

Authorization Basis (AB): On Monday, NNSA approved the revised LANL unreviewed safety question (USQ) procedure submitted last week (site rep weekly, 9/24/04). As a condition-of-approval, NNSA has imposed an interim policy on verification of safety control implementation. Under this interim policy either a readiness assessment or an operational readiness review shall be performed when a new documented safety analysis (DSA), technical safety requirement (TSR), or USQ does any of the following: identifies new safety-related equipment; significantly affects facility procedures; requires new training or retraining of facility personnel; or significantly modifies a facility's design baseline. Only the NNSA Site Office Manager has the authority to waive these requirements. Implementation details for the interim policy are to be developed.

TA-54 Waste Operations: During a recent resumption-related walk-down, NNSA observed approximately 1,000 Type 7A 85-gallon over-pack drums stacked three-high in one dome. The most recent AB for transuranic waste storage, approved in November 2003, precludes stacking these drums three-high because they are not certified for that drop height. The previous AB allowed stacking up to five-high. Confusion over the new AB's implementation schedule led the facility to conclude that the new AB requirements would not take effect until November 2004. Potential operational impacts due to space constraints and safety concerns with quickly moving a large number of drums have led to questions about the practicality of meeting the November deadline for un-stacking. LANL and NNSA are working on a path forward, which will likely involve accepting the current configuration in the short-term and committing to un-stacking the drums as a priority as space becomes available.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 8, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 8, 2004

Quirk was on-site this week augmenting site rep coverage of resumption activities.

Resumption Status: The LANL Director has approved resuming 46 % of the moderate and higher risk activities, including the first full nuclear facility resumptions: specifically for the Weapons Engineering Tritium Facility (WETF), the Los Alamos Neutron Science Center (LANSCE), and TA-50 and TA-54 moderate-risk waste operations. These facilities are using startup checklists or plans, mostly focused on formal work control and release, system alignments and operability, and collocated worker awareness.

The LANL Resumption Review Board (RRB) has concurred with 42 % of the higher risk activities moving forward into the lab readiness review (LRR) stage, including 4 of 9 groups of nuclear activities (i.e., 44 %). This week, the RRB concurred with LRRs commencing for the Plutonium Facility (TA-55) – except Pu-238 activities, the Chemistry and Metallurgy Research Building (CMR), and the Radiography Facility (TA-08). The TA-55/CMR LRRs will start next week, and LANL expects them to take 2 weeks. The RRB is currently reviewing the management self-assessment reports for Pu-238 operations, TA-18 critical experiments, and the site services contractor (KSL).

Overall, the quality of the management self-assessments (MSAs) being conducted is still mixed but improving. Nuclear facilities are self-identifying numerous issues and are generally firm in grading themselves; they are typically judging that one-fifth or more of the lines of inquiry are not satisfied. Some are reluctant to identify findings as pre-starts. The RRB continues to be the key element to ensure consistent quality of these reviews, including consistent identification of pre-starts.

Waste Operations: The TA-50/54 operations that are resuming include installation of the visual examination and repackaging glove-box in the Decontamination and Volume Reduction System (DVRS), as well as non-intrusive characterization of transuranic waste. To address pre-starts, these facilities have had supervisors trained on the new work control process and have tightened up both document control and work authorization. These resumptions are key steps toward LANL finishing the Quick-to-WIPP Program by October 2005, their current goal, and significantly reducing TA-54 risks.

Los Alamos Neutron Science Center (LANSCE): The majority of LANSCE pre-starts were related to work control. Although independently derived, LANSCE compensatory measures parallel those of TA-50/54. On a longer-term scale, LANSCE plans to resume user operations in the Lujan Center after addressing conduct-of-operations findings via a resource-loaded plan (site rep weekly 9/10/04).

Issue Management: LANL has established a senior-management-level Institutional Assurance Board (IAB). It will manage the laboratory's contractor assurance system including institutional issues, corrective actions and improvements, assessment of risk, assignment of priorities, and evaluation of effectiveness. All other lab assurance elements are subordinate to the IAB.

Authorization Basis: Because of the extent of issues already recognized with the LANL unreviewed safety question (USQ) process, LANL has proposed and NNSA has approved deleting review of USQ implementation from the scope of the nuclear facility LRRs. Instead, all LRR reports will contain an *a priori* institutional pre-start finding on USQ implementation and will reference the site-wide compensatory measures and the corrective actions currently being pursued to address these issues.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 15, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 15, 2004

Winters was on-site this week augmenting site rep coverage of resumption activities.

Management: LANL is splitting the Operations Associate Directorate into two parts: (1) Technical Services, and (2) Security and Facility Operations. The former will include functions such as performance surety, facility engineering, project management, health and safety, radiation protection, environmental protection, and operational efficiency. The latter will include waste operations, emergency response, security, facility support, and site planning.

Resumption Status: Lab readiness reviews (LRRs) for plutonium operations (TA-55, CMR) continue. The LRRs for Pu-238 operations and TA-18 critical experiments will likely begin next week, followed shortly by the LRR for TA-50/54 higher-risk waste operations. This week, one LRR team for a non-nuclear operation concluded that the prior management self-assessment (MSA) was incomplete, in spite of a well-prepared MSA report. The LRR team terminated their review and started a technical assist. While this is disappointing, it does demonstrate a level of integrity in the review process.

Critical Experiment Facility (TA-18): NNSA is overdue in submitting its report to the Board demonstrating that the safety-class in-core temperature monitoring system (ITMS) will operate reliably and effectively to prevent critical assemblies from overheating (ref: Board letter 7/9/03). NNSA and LANL are not pursuing ITMS because Security Category I/II operations at TA-18 will terminate in less than a year. This affects 4 of the 5 assemblies. The fifth, SHEBA, uses low-enriched uranium solution fuel and may continue to operate. SHEBA will require resolution of the ITMS-related issues, which could be as simple as a well-administered limit on plutonium sample size.

NNSA is delaying its response because of uncertainty in what critical operations are really required during the next year. The recent TA-18 MSA report describes operations management and resource issues. It appears to validate still-open concerns that were raised in a more recent Board letter (5/21/04). Because of these open issues, TA-18 appears to have limited near-term ability to support an expected broad range of complex operations including: early-move of Security Category I/II material, transition to Nevada Test Site, and critical assembly operations for experiments and training.

Radioactive Liquid Waste Treatment Facility (RLWTF): NNSA has approved mission need (i.e., Critical Decision 0) for an approximately \$60M RLWTF upgrade project. Since 1963, the RLWTF has collected, treated, and disposed of LANL radioactive and other liquid wastes. While construction has started on a new pump house and influent storage facility for the low-level streams, the larger upgrade project is key to ensuring continued reliability of the remainder of the facility, including those portions that process the higher-level transuranic waste streams from TA-55.

The upgraded facility is expected to be categorized as Hazard Category 2 (HC-2). The NNSA approval memo specifies that the preliminary functional classification of safety systems, the bounding accident scenarios, and other aspects of the facility safety basis be submitted and accepted by the NNSA Site Office authorization basis team as part of conceptual design and prior to LANL requesting approval of Critical Decision 1.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 22, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 22, 2004

R. Kasdorf was on-site this week augmenting site rep coverage of resumption activities.

Resumption Status: The LANL Director has approved resuming 56 % of the moderate and higher risk activity groups (i.e., 20 of 24 moderate risk; 4 of 19 higher risk; 24 of 43 overall). LANL is mid-way through reviewing and resuming nuclear operations. The Weapons Engineering Tritium Facility (WETF) has been approved to resume but still needs to resolve Operational Readiness Review (ORR) pre-starting findings from last Spring before starting up some activities. Certain TA-50/54 waste operations and the Los Alamos Neutron Science Center (LANSCE) were categorized as moderate risk and have also been approved to resume. The laboratory readiness reviews (LRR) for TA-55/CMR programs and infrastructure have completed field work. Reports should be completed next week. Two other LRRs began this week, covering TA-55 Pu-238 operations and TA-18 critical experiments and security category I/II operations. The Resumption Review Board (RRB) has accepted the management self-assessment (MSA) report for the TA-8 radiography facility, and its LRR should also begin soon. The RRB is reviewing MSA reports for both the site services contractor and TA-50/54 higher-risk waste operations. On-site transportation is still in the MSA phase.

Essential Activities: When the LANL Director suspended operations on July 16th, certain operations were deemed essential (i.e., Level-0) and were allowed to continue. The list of essential operations has been under change control since then. The LANL Resumption Plan requires that these activities be risk-categorized and reviewed in accordance with the plan. Because of programmatic pressure, LANL organizations are increasingly proposing certain activities be categorized as essential so that they can begin these activities before the resumption review and approval process is finished.

Two instances have occurred recently that may indicate less than adequate control of essential activities. In one case, an activity in a nuclear facility was deemed essential; however, the follow-on MSA identified pre-start findings – indicating a condition exists that is inconsistent with safe and secure operation. In the second case, a nuclear facility was preparing to recommend an activity as essential with the errant understanding that this designation would remove the activity from the scope of the on-going LRR. NNSA and LANL are increasing scrutiny of essential activities and have re-emphasized that no activity can proceed, essential or otherwise, until pre-start findings are resolved and that essential activities are not outside the scope of the resumption review process.

Issue Management: So far, the LANL resumption process has done a credible job of identifying both facility and institutional safety issues via the bottoms-up resumption review processes. However, actually realizing safety improvements from the stand-down investment will be fundamentally dependent on the laboratory's ability to manage the identified issues– i.e., systematically analyze the issues to develop achievable and effective corrective actions, prioritize these corrective actions in an integrated manner with other laboratory imperatives, and formally track the corrective actions to closure. Unfortunately, the laboratory's issue management processes remain ill-defined and incapable of substantively influencing institutional priorities. Expedited improvements appear warranted.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 29, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 29, 2004

Resumption Status: LANL readiness review (LRR) teams submitted their reports to the Resumption Review Board this week for plutonium operations (TA-55/CMR) and will likely submit reports next week for both TA-18 security category I/II and TA-55 Pu-238 operations. An LRR has started for TA-50/54 higher-risk waste operations, and another should start next week for TA-8-23 radiography.

Plutonium Facility (TA-55): NNSA has approved an interim addendum (expires 3/30/05) to the TA-55 authorization basis (AB) to allow LANL to finish cleanup of the room contaminated with Pu-238 in August 2003. Cleanup of the room essentially stopped about 6 months ago because of AB issues. The approved addendum permits residue cans in filtered plastic bags to be transferred into either glove-boxes or 55 gal Type A drums with plastic drum liners and filters. Drum limits consider heat loading and material-at-risk. Until the residue is dispositioned, the drums will be stored on the floor in TA-55 in locations picked considering seismic and fire risks. The drums will also undergo periodic radiological and visual inspection. Over-packing will start after the LANL Director approves TA-55 resumption and is expected to take 2 months. In a generic sense, the interim AB addendum approach appears useful for facilitating focused, short-duration risk reduction activities lab-wide. As for TA-55, disposition of the corroding cans of Pu-238 residue and cleanup of this room would constitute a significant risk reduction, as discussed in the Board's letter of 9/13/04.

Critical Experiments Facility (TA-18): LANL has reported that TA-18 moved security category I material prior to fully resolving pre-start findings and to receiving resumption approval. Management misinterpreted the Director's approval of certain essential (i.e., Level 0) operations as having precedence over addressing pre-starts identified later that apply to security category I/II operations. The LRR team has also found that TA-18 has not fully adhered to their combustible loading surveillance procedure, including missing review steps by management and by a fire protection engineer. LANL reports that combustible load limits were not exceeded. Overall, while LANL is making some improvements, TA-18 operational staffing, management, and control do not currently appear commensurate with the risks of the proposed full range of operations (site rep weekly 10/15/04).

Radioactive Liquid Waste Treatment Facility (RLWTF): NNSA and LANL will likely need to decide within a few weeks on whether to allow the Plutonium Facility (TA-55) to transfer transuranic (TRU) liquid waste to the RLWTF and to allow the RLWTF to resume treating such waste. The site reps understand that TA-55 may begin to resume operations soon and that TA-55 caustic liquid storage is now nearly full. While the TA-55 tanks are contained within glove-boxes, it is poor practice to store this waste for an extended period. Low storage capacity may impact resuming both national security and nuclear material stabilization missions (i.e., Board Recommendations 94-1/00-1).

While TA-55 may have issues, the ability of the RLWTF to safely receive and treat TRU waste is questionable. For example, the caustic waste receipt tank leaked last year and has since been used only for direct transfer to avoid challenging the known leak-site (site rep weeklies 9/19/03, 10/24/03). Efforts to order a replacement tank have stalled during the last year due to still-unresolved authorization basis and engineering equivalence questions. Another example is a clarifier tank that has visible corrosion and un-characterized mechanical integrity (site rep weekly 7/30/04). It appears to be a potential single-point-failure for processing. If the clarifier leaked, the leakage would be contained within the building but would be radiologically challenging to clean up. TA-55 and RLWTF are developing a joint path forward to propose to the Resumption Review Board.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 5, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 5, 2004

Winters was on-site this week participating in the Quick-to-WIPP discussions. Martin, Nichols, and Von Holle were on site attending a high explosives conference.

Resumption Status: The Director has approved resumption of plutonium operations (TA-55/CMR, except Pu-238), as well as health, safety, and radiological services. TA-55 and CMR are planning a deliberate inventory and resumption effort during the next month. Overall, the LANL Director has approved resuming 63 % of the moderate and higher risk activity groups.

Quick-to-WIPP Program: This program involves shipping ~2,000 transuranic waste drums with the highest, most dispersable inventory to WIPP. LANL shipments to WIPP were suspended in Oct 2003. Characterization activities briefly resumed in July but were then suspended on July 16th as part of the LANL-wide stand-down. NNSA, LANL, DOE-EM, Carlsbad Field Office (CBFO), and the CBFO contractor met this week to determine a path-forward to quickly resuming compliant characterization and shipping, and progress was made. Key goals are to resume non-intrusive characterization shortly, achieve a full characterization rate of 60 drums per week by January, resume shipments no later than March, and complete the program in October. Continued close cooperation between multiple agencies is required for success. Since these actions address the highest-consequence nuclear accident postulated at LANL, it appears prudent for NNSA and LANL to consider categorizing Quick-to-WIPP activities as essential (i.e., Level 0). This hazard will likely persist after October 2005, since LANL anticipates a new round of recovering high-activity waste from underground. NNSA and LANL would be well-served to consider accepting higher short-term risks (e.g., seismic) to expedite efficiently shipping this waste to WIPP and thereby achieve timely overall risk reduction.

Tritium Facilities: The path forward for the one remaining TA-21 nuclear facility (TSFF) is ambiguous. LANL identified authorization basis (AB) issues during resumption reviews last month and indicated that an essential activity would be proposed near-term to remove 3 waste drums containing more than 90% of the facility's source term (site rep weekly, 9/24/04). This would reduce the radioactive inventory below the hazard category 3 threshold and thereby permit downgrading TSFF. To date, this has not happened; in fact, NNSA continues to press LANL to control the facility to a 1986 AB and to fully implement a new AB. It appears more appropriate to expedite removing the source and downgrading TSFF, based on this facility being slated for near-term closure.

Essential Activities: NNSA and LANL continue to have inadequate control of activities deemed essential (i.e., Level 0 – see site rep weekly 10/22/04). These activities are allowed to proceed prior to completion of the resumption review process and originally were just those necessary to keep facilities safe, stable, and secure. LANL is increasingly proposing other activities as essential based on programmatic drivers (e.g., Pu-238 fueled clads completion, TA-18 emergency response training). In at least one case, NNSA and LANL organizations bypassed the LANL Director approval and NNSA Site Manager concurrence for a proposed essential activity, which was subsequently suspended pending proper approval. NNSA and LANL have also not designated key risk-reduction activities as essential, such as TSFF source reduction, the Quick-to-WIPP Program, and Pu-238 room decon in TA-55. LANL has prepared guidance on re-designation but has not disseminated the guidance. More rigor in managing essential activities is necessary ensure the integrity of the resumption process.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 12, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 12, 2004

Critical Experiments Facility (TA-18): LANL has completed the laboratory readiness review (LRR) of N-Division activities involving Category I/II materials, which includes TA-18 critical assemblies. This review identified significant operational issues including: lack of adequate staffing; weak level of knowledge of TSR requirements; superficial implementation of the integrated work management process; poor conduct of operations as evidenced by procedural compliance problems; and an overall low state of morale. These issues are similar to those previously identified in a May 2004 management self-assessment at TA-18 (site rep weekly 7/2/04).

N-Division management is scheduled to present their proposed path forward for addressing these issues to the Resumption Review Board next week. Previous presentations to LASO management indicated that N-Division is pursuing some positive initiatives to improve their operational capabilities. However, given the depth and breadth of the issues, it is uncertain whether necessary improvements can be achieved prior to the September 2005 deadline for cessation of Category I/II activities at TA-18.

Plutonium Facility (TA-55): The LANL Director has approved resumption of TA-55 Pu-238 operations. The LRR review of these operations identified several areas needing improvement, including: more timely repair of degraded equipment and revision of incorrect procedures; more rigorous management of on-the-job training; and more deliberate confirmation of readiness. On the positive side, the LRR team found that management effectively communicates information to workers and workers understand the importance of procedural compliance.

Deliberate resumption of Pu-238 operations is a key step for LANL to clean-up Room 201B, which was contaminated with Pu-238 in August 2003. LANL also intends to quickly finish 23 encapsulated fueled-clads to support the NASA New Horizons mission to Pluto. DOE has stated that the 23 fueled-clads are sufficient and that the new scrap recovery line is not needed to support the New Horizons mission (ref: Board letter 8/1/03). Given the progress of the MSA/LRR resumption process, an essential activity re-designation for the fueled-clad activity is no longer being pursued.

Radiography Facility (TA-8-23): TA-8-23 is a 1940s era building that is used for non-destructive testing of high-explosives and nuclear components. The current safety basis for this hazard category 2 facility is a 3 year-old justification for continued operations (JCO). TA-8-23 lacks seismic, confinement, and fire suppression features; however, the dominant hazard (a natural gas line) has been removed. Several attempts to update the safety basis have been unsuccessful. In April 2004, NNSA suspended TA-8-23 operations with explosive and tritium items due to lightening protection deficiencies and safety basis confusion. Efforts to recover from this suspension were superseded by the lab-wide stand-down on July 16th, 2004.

Last week, NNSA approved an interim path forward consisting of (a) rescinding the latest proposed safety basis (submitted in June 2004), (b) resolving all resumption review pre-start findings, (c) and restricting material-at-risk to 40 g Pu-239 equivalent (limits off-site consequences to 2 rem). Additionally, LANL has committed to cease operations if a new safety basis is not approved by March 2005.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 19, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 19, 2004

Andrews, Jordan, and White were here this week reviewing LANL resumption status.

Resumption Status: The LANL Director has approved resuming 67 % of the moderate and higher risk activity groups (i.e., 21 of 24 moderate risk; 8 of 19 higher risk; 29 of 43 total). Overall, the reviews have been rigorous, and the startups are proceeding deliberately. The resumption effort has improved LANL's management self-assessment (MSA) capability, but further improvement is still warranted and is receiving attention. Systematic analysis of review findings and development of corrective action plans are both about half-done. More emphasis on standardized resolution of local issues would be beneficial (i.e., take the best ideas from around the lab to develop common solutions). Where they fit, institutional issues are being captured in the Operational Efficiency Project; however, that project does not include nuclear material management (i.e., Recommendations 94-1/00-1), lab-wide corrective actions from the TA-55 Pu-238 uptake event (8/03), or lab-wide fire protection improvements. These other areas also warrant priority. Status of some nuclear operations follows:

Radiography Operations (TA-8-23): The LANL Director approved a limited resumption this week. Operations with explosives and tritium are prohibited until a lab readiness assessment confirms lightning protection and related issues are corrected. Operations involving greater than 40 g Pu equivalent are prohibited until safety basis deficiencies are addressed.

Critical Experiments Facility (TA-18): This week, TA-18 received "essential-activity" approval to begin packaging security category I/II material for shipment to Nevada Test Site and to TA-55. TA-18 has developed a plan to address the issues reported last week. While the plan appears promising, it would be prudent if performance metrics were established and if more progress were made before certain operations resumed, including critical experiments. NNSA and LANL are on this course.

Solid Waste Operations: The lab readiness review (LRR) team has completed field work and their report is imminent. Non-intrusive characterization activities to support the Quick-to-WIPP program should start in mid-December. The TRUPACT loading facility (TA-54 RANT) has seismic issues involving the roof-to-wall connections that need to be reconciled prior to resumption.

Plutonium Operations: TA-55 and CMR have approval to resume, including Pu-238 operations. They will complete material inventory next week. As a result of clean-out operations, TRU caustic solution storage is nearly full (~95 %), increasing pressure to discharge to TA-50 (RLWTF).

Liquid Waste Operations: After 14 months, RLWTF has received approval to procure but not yet install a replacement for the leaking caustic waste receipt tank. The delay is largely due to confusion on what constitutes a major modification requiring a preliminary documented safety analysis (PDSA). Because of material condition, RLWTF capability to receive and treat TRU waste is questionable.

Tritium Operations: WETF has resumed operations. TSFF will propose de-inventory as an essential activity, which could positively accelerate its re-categorization as a radiological facility.

Other Operations: LANSCE is proceeding toward deliberate resumption of Lujan Center operations. Activities involving the site support contractor (KSL) and on-site transportation are still under review.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 26, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: T. D. Burns Jr. and C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending November 26, 2004

Resumption Status: Most LANL nuclear operations have resumed to some degree, based on LANL verifying that pre-start findings are either corrected or have an adequate compensatory measure in place. On October 1st, LANL proposed and NNSA approved removing Unreviewed Safety Question (USQ) issues from the scope of the lab readiness review process based on the fact that problems with the USQ process were already well-known and corrective actions were underway (site rep weekly 10/8/04). As part of the corrective actions, NNSA directed LANL to establish a USQ review team that would mentor facilities and review new and existing USQs for adequacy. LANL and NNSA agreed to capture these issues as institutional pre-start findings for all nuclear facilities and cite the on-going corrective actions in the Operational Efficiency project as accepted compensatory measures.

In a November 19th memo, NNSA indicated that the current protracted schedule and uncertain funding for on-going corrective actions would place the USQ issue back as a local pre-start finding for every nuclear facility. While timely resolution of the USQ-related corrective actions is important, this new course does not reflect a balanced perspective of the relative safety risks, such as those discussed in the Board's letter of September 13th. NNSA and LANL need to carefully balance safety priorities and reach a sound consensus on the immediate actions, if any, for operating nuclear facilities and on the schedule and funding for the longer term corrective actions.

Critical Experiments Facility (TA-18): Two recent occurrences are indicative of TA-18 safety basis issues. First, LANL has self-identified that the CASA 3 combustible limits in the NNSA-approved Basis of Interim Operation (BIO) and the Technical Safety Requirements (TSRs) are five times higher than assumed in the safety analysis, as documented in a BIO appendix. LANL has taken action to reduce the CASA 3 combustible inventory to below the more conservative limit. Second, LANL has missed implementation plan milestones for transition to use of approved robust storage containers for non-metallic material-at-risk. LANL has also missed the annual in-service-inspection of such containers. LANL is placing these materials into TA-55 standard cans as a compensatory measure.

Conduct of Engineering: NNSA and LANL are overdue in responding to the Board's January 27th letter on LANL lack of implementation of DOE Order 420.1A, *Facility Safety*. LANL has included implementation within the scope of the institutional Operational Efficiency Project, which has increased its visibility but also delayed development of a resource-loaded schedule. LANL has made some progress within the last year, such as updating the engineering standards manual, a requirements document (site rep weekly 3/12/04). The NNSA Site Office has also issued a review procedure covering the interface between design and safety basis through conceptual design. However, LANL still lacks an institutionally-consistent systems engineering program, as well as institutional engineering procedures that standardizes practices to meet requirements. These would support safety system design and evaluation for both existing and new facilities (e.g., the CMR Replacement).

Also, for more than a year, NNSA and LANL have iterated on what constitutes a major modification that requires a preliminary documented safety analysis (PDSA). This has impacted several projects with safety implications, such as the RLWTF tank replacement discussed last week (14 month delay) and the CMR large vessel clean-out installation (11 month delay, site rep weekly 2/6/04). The latter will likely impact DOE meeting commitments to the Board under Recommendations 94-1/00-1.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 3, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 3, 2004

Hadjian and Jones were here this week observing LANL preparations to update the LANL-wide probabilistic seismic hazard analysis.

Plutonium Facility (TA-55): NNSA and LANL need to aggressively renew their efforts to address the findings from the Pu-238 Type B investigation of nearly a year ago (site rep weekly 12/19/03). This effort has stalled during the stand-down and is just now resuming. Some areas needing attention are: developing comprehensive requirements for safe stabilization, storage, and disposition of Pu-238 materials; completing the LANL comprehensive nuclear materials packaging and storage plan; and completing the preliminary LANL-wide inventory assessment of radioactive material outside an approved containment boundary. Regarding the Pu-238 contaminated room, LANL is preparing procedures to over-pack residues and complete the cleanup; however, starting up additional pyrolysis capability and disposing of stabilized residues may be delayed for up to a year, depending on how NNSA and LANL perceive the relative risks (e.g., seismic and building leak path issues vs extended storage of Pu-238 contaminated cheese-cloth and other residues in drums and glove-boxes in PF-4).

Critical Experiments Facility (TA-18): On Thursday, the LANL members of the Resumption Review Board (RRB) approved a division-level recommendation to restart TA-18 subject to completion and line management validation of all corrective actions for pre-start findings. The LASO member of the RRB withheld his concurrence with this approval recommendation. Though generally satisfied with the resumption plan, he indicated that he would withhold concurrence until (a) LASO has independently verified that the proposed corrective actions are both completed and effective, and (b) LANL has submitted and LASO has accepted a resource-loaded plan outlining proposed future TA-18 activities. Regarding those activities, the potential accident consequences of two of the five proposed critical experiments for FY05 have not been analyzed and may result in the need for Safety Class controls. An expedited effort to evaluate the potential accident consequences of the proposed critical experiments and demonstrate the adequacy of the associated controls is warranted and will be necessary to address the concerns raised in the Board's May 21, 2004 letter.

Emergency Exercise: On Wednesday starting at 6:45 AM, NNSA conducted a no-notice exercise that activated the LANL Emergency Operations Center (EOC). The scenario involved a transportation accident with injuries and a chemically reactive, toxic plume release. The NNSA team tentatively concluded that incident command, and event categorization and classification were properly executed; however, most other areas need work, including EOC communications, consequence evaluation, protective action confirmation, and HAZMAT response time. Many issues seen were already known from post-Cerro Grande fire reviews or other recent exercises, but they remain unresolved.

Tritium Operations: NNSA appears to have decided to transfer the neutron tube target loading (NTTL) mission from LANL to Sandia. The LANL Weapons Engineering Tritium Facility (WETF) has been preparing to receive the mission for years and is nearly ready. NTTL operations are currently performed in the TA-21 Tritium Science & Fabrication Facility (TSFF)— a 40 year old facility with legacy contamination from previous missions and an ill-defined safety basis. The transfer decision may extend operations in TSFF by more than a year. The path forward may warrant re-consideration due to the risks associated with continuing to run TSFF and the NTTL investment already made in WETF..

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 10, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 10, 2004

Malen, Plaue, and Tontodonato were here this week reviewing nuclear material management and other activities. Burns was off-site this week.

Resumption Status: The LANL Director has approved resuming 77 % of the moderate and higher risk activity groups (i.e., 24 of 24 moderate risk; 9 of 19 higher risk; 33 of 43 total). Considering nuclear operations, the LANL Resumption Review Board (RRB) has forwarded to the Director the recommendation that TA-18 fully resume following resolution of pre-start findings; NNSA has not concurred. The TA-50/54 lab readiness review (LRR) team completed field work on intrusive waste operations about 3 weeks ago and expects to submit its report today. LRRs for the site services contractor (KSL) and for on-site transportation are still open. The TA-21 tritium facility (TSFF) has a de-inventory plan but will need management support for this as an essential activity. NNSA has formally declared that the site-wide unreviewed safety question (USQ) issues constitute an open pre-start finding for every nuclear facility; LANL and NNSA have informally agreed to not let this impact operations, based on LANL's intent to address the issues on a timely basis (site rep weekly 11/26/04).

Critical Experiments Facility (TA-18): NNSA has established its own interim senior supervisory watch over on-going TA-18 security category I/II material operations (i.e., the Early Move Project). The watch consists of 3 federal site office assistant managers. The trigger events for this action were: (a) TA-18 conducting security category I/II operations last Friday without the LANL senior supervisory watch, counter to this activity's approval conditions; and (b) a TA-18 worker in respirator and protective clothing reclining on the floor in a controlled contamination area on Wednesday, also during a security category I/II operation. A few likely underlying causes for these issues are attitude, training/level-of-knowledge, unclear management expectations, and programmatic pressure to meet Early Move milestones, which have no schedule contingency. Overall, TA-18 operational control does not appear commensurate with the risks of either current activities or full resumption.

Plutonium Facility (TA-55): LANL determined this week that a TA-55 worker may have received an elevated Pu-238 uptake in June. The potential uptake was detected via a discretionary bioassay among personnel who were working in a Pu-239 lab-room that had one elevated fixed-head weekly sample (~150 DAC-hours, Pu-238). The glove-box work station below the sampler was found to have a glove with a pin-hole leak. There were no other indicators of a release, and the other workers in the room during this period were not found to have received an elevated dose. LANL is investigating.

Nuclear Material Management: NNSA and LANL need to apply more emphasis on finishing the corrective actions from the Pu-238 Type B investigation of a year ago; as is, the priority assigned to the TA-18 Early Move Project may overwhelm other areas needing attention. Constraints on transuranic waste operations are also skewing the risk reduction strategy toward packaging and storing materials over processing or discarding. These constraints include: (a) TA-50/54 not approved to resume; (b) TA-50 RLWTF material condition, as previously reported; (c) TA-54 above-ground inventory nearly at the safety basis limit; and (d) continued delay in LANL resuming WIPP shipments. As a result, TA-55 caustic liquid waste tanks are full, and the TA-55 PF-4 basement waste inventory is approaching control limits (e.g., in some areas, drums are double-stacked). Without action, TA-55 could become "waste-logged," which has both safety and national security mission implications.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 17, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 17, 2004

Resumption Status: About a quarter of LANL moderate and higher risk activity groups have not yet been approved to resume, including waste operations and site support contractor (KSL) activities. Many remaining activities have been deemed essential and have continued in parallel with resumption reviews. The formal process has been that line management proposes activities as essential after Resumption Review Board (RRB) concurrence. Also, when resumption reviews identify an applicable pre-start finding, essential activities have stopped until adequate compensatory measures are in place.

Based on recent events, formal control of the resumption process and of essential activities is eroding – a trend that needs to be reversed. Formal closure of RRB traveler actions would be beneficial. A systematic review of the many corrective action plans now being pursued for consistency, completeness, and effectiveness would also be worthwhile (site rep weekly 11/19/04). Unless such a review is done and acted upon, LANL may return to conditions existing at the time of the stand-down.

Radioactive Liquid Waste Treatment Facility (RLWTF): The Plutonium Facility (TA-55) is nearly waste-logged, which has mission and safety implications. The LANL Director and the NNSA Site Office Manager have approved the TA-50 RLWTF receiving and processing TA-55 transuranic liquid waste next week, as an essential one-time-only activity. This has safety implications for RLWTF (site rep weekly 10/29/04). TA-50 plans to mitigate risks by keeping the liquid level in the waste receipt tank below the known leak site and by-passing a corroding clarifier tank. While this may be acceptable, the RRB has not formally reviewed and concurred in this activity as essential, nor has the NNSA Site Office extended previous authorization basis approval to use the leaking waste receipt tank.

Site Support Contractor (KSL): LANL and KSL have aggressively inserted management into the KSL integrated work control process as a compensatory measure for an approved but failed compensatory measure involving checklists and training. LANL resumption reviews have found the checklists and training are ineffective - conditions that elsewhere led to suspension of activities deemed essential. The aggressive management steps appear to be the actions that should have been taken in the first place. These steps have not been formally reviewed and concurred in by the RRB as the compensatory measure. Furthermore, the failed compensatory measure is representative of the corrective actions being pursued by other LANL organizations (e.g., checklists or procedure changes that may not really address the issue). The effectiveness of such corrective actions is suspect.

Critical Experiments Facility (TA-18): TA-18 operations are suspended until LANL proposes and NNSA approves a credible, integrated, and resource-loaded plan for FY-05 activities. LANL intends to propose and have the plan in place by January 15th. Meanwhile, NNSA is requiring that the Site Office Assistant Manager for Operations concur in the plan-of-the-day and in the work release of all higher risk activities and all moderate risk activities involving nuclear material, except for emergency actions. NNSA intends to release only those activities required to ensure safety and security.

Chemistry and Metallurgy Research Building (CMR): On Wednesday, Wing 5 evacuated and LANL Hazmat team responded after potentially shock-sensitive dried perchlorates were found on a bottle in a storage cabinet. The NNSA facility rep and CMR raised concerns about the first response plan. After more information became available, Hazmat entered and successfully removed the hazard.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 24, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 24, 2004

Plutonium Facility (TA-55): Both the current (1996) and proposed (2002) authorization bases for TA-55 specify a safety-class passive ventilation confinement strategy, which is the subject of Board Recommendation 04-2. In April, the staff questioned the TA-55 analyses. Last Friday, LANL submitted to NNSA a re-analysis and concluded that the building leak path factor is 10 to 50 times higher than previously asserted and that neither passive nor active confinement modes can mitigate the potential off-site consequences to below evaluation guidelines. On Monday, NNSA directed LANL to immediately analyze other controls that can reduce the predicted consequences and to propose compensatory measures by January 7th. Timely resolution is needed to support continued operation.

There are number of other issues with the TA-55 1996-era authorization basis besides leak path factor, such as incomplete functional classification and no requirements for in-service inspections, storage container pedigree, and material-at-risk limits. Because of LANL resumption efforts and leak path factor re-analysis, the safety basis upgrade has been delayed another 6 to 8 months. A totally integrated upgrade with full resolution of leak path factor issues is preferred, but if not achievable in short order, a partial upgrade including compensatory measures for known weaknesses may be a better option.

Solid Waste Operations (TA-54): Risk reduction in TA-54 relies on shipping transuranic waste to WIPP, which stopped in October 2003 and is now not expected to resume until May 2005. The new safety basis, which is still being implemented, includes a material-at-risk (MAR) limit that is about 5.5 % above current inventory. It also requires that LANL ship the roughly 2,000 drums with the highest, most-dispersible inventory to WIPP by September 2004, which was missed. This is the Quick-to-WIPP Program. Earlier this year, LANL proposed October 2005 as the new Quick-to-WIPP completion target.

NNSA now believes that LANL and the WIPP contractor can realistically achieve only about 40 % of the intended WIPP shipments in FY-05 (i.e., 40 instead of 96 shipments). Furthermore, since May 2002 when the Quick-to-WIPP initiative began, TA-54 has received more waste, and the number of drums meeting the Quick-to-WIPP criteria has increased by about 800 to about 2,800 drums.

Further receipts by TA-54 will likely be constrained by the MAR limit until shipment rate improves. This has mission and safety impacts. NNSA is considering (1) allowing TA-55 to ship roughly 300 drums next month to TA-54 so that TA-55 can continue to operate, and then (2) constraining TA-55 direct-discard efforts that are underway in response to the Board's Recommendations 94-1/00-1 so that TA-54 can continue to operate. This course could adversely impact commitments made by the Secretary of Energy to the Board. The risk trade-offs of such a decision have not been evaluated.

High Efficiency Particulate Air (HEPA) Filters: TA-55 secured programmatic work in one room for about a week while investigating elevated fixed-head air samples. The likely cause is an infrequently used glove-box vent HEPA filter. On Monday, a transfer of transuranic caustic liquid waste from TA-55 to TA-50 RLWTF was stopped when a continuous air monitor alarmed in the TA-50 treatment room. No contamination was found, and nasal swipes of the four people in the room were negative. The alarm was attributed to a tank vent HEPA filter, which is being replaced. TA-50 and TA-55 are taking independent actions to address these issues. LANL would be well-served to pursue unified institutional action using guidance in the DOE nuclear air cleaning handbook (DOE-HDBK-1169-2003).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 31, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 31, 2004

LANL was closed this week, providing an opportunity for reflection on the year.

On July 16th, the LANL Director suspended all but essential operations, and LANL began a self-examination and resumption process. As of last week, the Director had approved resuming 77 % of the moderate and higher risk activity groups. Nuclear operations not yet approved to resume include TA-50/54 waste operations, the site services contractor, on-site transportation, TA-18 critical experiments facility, and TA-21 tritium facility (TSFF). LANL reports they have examined more than 3,000 operations and identified more than 2,000 safety-related corrective actions from this process.

A major challenge for LANL in the coming year will be to ensure that these corrective actions are consistent, complete, sustainable, and effective. Over the years, LANL has often identified valid issues, prepared corrective action plans that appeared credible, and then failed to execute. A recent example is the stalled TA-55 Type B corrective action plan, which began early this year. LANL studies of corrective actions from reportable occurrences illustrate the problem: most corrective actions are reactive, one-time, facility-specific responses; most target procedural changes or equivalent; few eliminate or substitute for the hazard; few specify new or modified engineered barriers; and few opt for institutional solutions. The level of sustained management commitment required to reverse this trend should not be underestimated.

Worker safety and work control issues contributed to the decision to suspend operations. In September, LANL issued a Conduct of Operations Manual, an updated integrated work management process, and a schedule to implement the latter by June 2005. In October, LANL corrected span-of-control problems by splitting the Operations Directorate and increased visibility and independence of key institutional functions including engineering, fire protection, and emergency management; however, NNSA and LANL continue to be reactive on emergent safety issues, such as TA-18's operational issues during the last year.

While the resumption reviews provided a shot-in-time perspective, the conditions that led to suspension could recur unless NNSA and LANL improve their assessment processes – including improving management's timely and accurate awareness of emergent operational issues. LANL assessment processes are not robust. The LANL Director has stated that he suspended operations because of a pattern of near misses in safety and security that created a fundamental lack of confidence in the lab's ability to conduct work without a major mishap. At the time of suspension, NNSA had an effective operational oversight process, but its effectiveness has sharply eroded due to resumption demands on staffing and to shifts in assignments and responsibilities. Most NNSA Site Office reporting of emergent safety issues now is informal and not amenable to systematic review. NNSA is currently attempting to rebuild its oversight processes, as well as verify corrective action closures. This will likely require increased staffing.

Regarding safety bases, within the last 2 weeks, NNSA has approved a LANL strategy for determining which proposed activities constitute a major modification requiring a Preliminary Documented Safety Analysis (PDSA). NNSA also clarified that interim safety bases employing safe harbor methodologies may be appropriate when the unreviewed safety question process is insufficient but a PDSA would be excessive. These are the most positive steps regarding safety bases taken this year. In most other areas, the safety basis issues discussed in the Board's letter of May 27th persist. Little progress is apparent on centralizing the safety basis function, improving quality of NNSA and LANL work, capturing a verified list of the safety bases, and updating aging safety bases (e.g., for plutonium operations – TA-55, CMR).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 7, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 7, 2005

Resumption Status: The LANL Director approved resumption for on-site transportation this week. The lab readiness review report covering TA-50/54 intrusive waste operations, a critical area, is still not submitted; field work was done about 7 weeks ago.

LANL has made progress on systematically analyzing several thousand institutional issues reported during the resumption reviews; this has led to identifying common problems that potentially require institutional action. However, LANL continues to struggle to formulate complete and effective corrective actions for both institutional and local (i.e., facility-specific) issues. Progress has been particularly slow on local corrective actions, and no mechanism is in place to ensure their integration and consistent quality. NNSA is justifiably concerned with the lab's slow apparent progress. LANL senior management is meeting weekly with NNSA to provide status and has committed to completing the resumption, including corrective action plans, by January 31st.

Federal Oversight: The NNSA Site Office has submitted to headquarters a facility representative (FR) staffing analysis. It indicates a need to increase the number of field-deployed FRs from 11 to 20, as well as permanently assign 2 team leaders and possibly 1 manager (these slots are temporarily filled now by 3 FRs). This would strengthen federal oversight of nuclear and other higher-hazard operations; introduce federal oversight into several dozen radiological and moderate hazard facilities that currently receive no regular federal oversight and little contractor independent oversight; and facilitate verification of closure of facility-specific corrective actions identified from resumption reviews. It does not include additional subject matter experts that may be needed to followup on LANL institutional corrective actions.

Integrated Safety Management (ISM): This week, the TA-50 Radioactive Liquid Waste Treatment Facility had an operator who was sprayed with treated waste water, and the TA-48 Radiochemistry Laboratory (RC-1) had a 17-year-old student who was nearly splattered by low-level tritium and xylene when a small vial shattered. The student was trained but was working alone. Radcon personnel responded but were not informed before entry of the operations in the room or of the presence of a chemical hazard; the emphasis was radiological, similar to the TA-55 toxic vapor event (site rep weekly 1/16/04). While both events had little direct safety consequence, NNSA and LANL reviews have found lessons that could improve implementation of the new integrated work management process.

Authorization Basis (AB): LANL is evaluating several recent instances of inadequate safety analyses or safety basis implementation including: (1) the leak path factor for the Plutonium Facility (TA-55) appears non-conservative, raising questions on the effectiveness of approved controls (site rep weekly 12/24/04); (2) the LANL Policy Office rescinded and then restored 30 lab performance requirements (LPRs) after it was determined that they are referenced in several nuclear facility safety bases; this is an example of institutional-level changes unwittingly affecting nuclear operations without analysis of the possible impact; (3) the TA-18 safety basis credits radiographers as being certified or qualified without defining the terms; this follows on confusion about TA-18 combustible loading inspections (site rep weekly 11/26/04); (4) questions have been raised about triple-stacking of transuranic waste drums in TA-54 and the height of conveyors used in non-destructive characterization of waste drums.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 14, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 14, 2005

Management: LANL has committed to resuming all operations by January 31st; a few operations are likely to remain to be resumed. In particular, LANL now expects to pursue a DARHT hydrotest in March as an essential activity. LANL is also under intense pressure to complete the TA-18 Early Move Project by September. Increased resources and emphasis on these activities may decrease both federal and contractor attention and oversight of nuclear operations.

Plutonium Facility (TA-55): TA-55 appears to be under increasing operational stress as a result of vault space limitations, waste-pathway constraints, the expected influx from TA-18 to support the Early Move Project, the current 1996-era inadequate safety basis, and now the emergent leak path factor issue (site rep weekly 12/24/04). The situation will be aggravated if, in the interest of time, TA-18 ships material to TA-55 in packaging that does not meet TA-55 packaging standards.

Last Friday, LANL proposed and NNSA approved a set of interim compensatory measures to address the leak path factor issue and directed LANL to aggressively begin identifying potential solutions using a cost-benefit approach. The risks associated with continued operation, however, need to be better understood. The approved compensatory measures focus on mitigating the consequences of a Pu-238 lab room fire, which was the single accident that LANL evaluated. While this addressed one accident scenario, it did not address other known scenarios with potentially significant consequences (e.g., basement waste fire, vault fire). Consequently, the approved controls are probably necessary but may be insufficient to address the full spectrum of potential accidents that could occur in TA-55.

NNSA and LANL have options that could aggressively reduce those risks. For example, the poorly containerized Pu-238 combustible residues in the room that was contaminated in August 2003 may now constitute a more significant risk than NNSA and LANL previously recognized; in fact, they may dominate the risk among main-floor operations. Deliberately but expeditiously cleaning up this room, packaging the residues, and pyrolyzing them would reduce risk. On the current course, starting up additional pyrolysis capability and disposing of these residues could be a year away (site rep weekly 12/3/04). Similarly, TA-55 is nearly waste-logged (site rep weeklies 12/17/04, 12/24/04). Addressing the obstacles to TA-55 transferring waste, including resuming WIPP shipments from TA-54, would also reduce risk.

Finally, TA-55 continues to operate under a safety basis that has been increasingly shown to be outdated. The safety basis support for TA-18 Early Move and for TA-55 resuming pyrolysis operations will compete for resources required to fully update the TA-55 safety basis. It may be advisable for NNSA and LANL to consider a partial update, together with an interim safety basis that specifically addresses the leak path factor issue.

Readiness Assessments: LANL needs to improve its management self-assessment (MSA) process. The lab readiness assessment (LRA) of TA-54 Area G safety basis implementation started and prematurely stopped this week, indicating a weak MSA; preliminary estimates are that it will be several more months before this safety basis is implemented and verified. An LRA for the Radiography Facility (TA-8-23) was completed this week, but the findings indicate another weak MSA.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 21, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 21, 2005

Winters was on site this week to discuss LANL-WIPP interaction.

Resumption Status: This week, the LANL Director presented to LANL his assessment of status: operational safety, security, and compliance have improved as a result of the resumption effort; they are now satisfactory; and they will continue to improve as a result of initiatives such as the Operational Efficiency Project and a new effort focused on behavior-based safety. The NNSA Site Office view is that LANL deserves credit for a largely successful resumption effort, completed in 6 months, that identified thousands of issues; however, it remains to be seen whether LANL can succeed at evaluating the issues systematically and at implementing consistent and effective longer-term corrective actions. Currently, LANL is running behind earlier expectations on both institutional and local corrective actions. NNSA is pursuing federal staff augmentation to improve federal oversight of these activities.

The site reps observe that LANL could increase its chances for success by following up on improvements to the LANL corrective action program suggested a year ago by an assist team from the Institute for Nuclear Power Operations (INPO); LANL could also establish an institutional body to ensure a consistent level of quality in the corrective actions. LANL is considering such initiatives.

Waste Operations: The Quick-to-WIPP program is intended to expeditiously ship the roughly 2,000 highest activity drums at LANL to WIPP and thereby reduce the risks associated with the highest consequence accident postulated at LANL in approved safety analyses; it would also provide much needed operating margin for both TA-54 Area G waste operations and the TA-55 Plutonium Facility.

LANL's last shipment to WIPP was in October 2003. Drum characterization resumed this month. LANL now expects to resume shipping drums in April 2005 and to complete Quick-to-WIPP in June 2006 – 21 months later than originally planned. There are a number of near-term actions needed for success, including: (a) complete and verify implementation of the Area G safety basis, which addresses the small to moderate risk accidents; (b) complete Operational Readiness Reviews and startup of the DVRS glovebox line; (c) install additional non-destructive examination capability; (d) establish a 2nd TRUPACT loading station. This effort has gone poorly since, at least, the LANL stand-down (7/16/04); the latest indicators are from the lab readiness assessment on safety basis implementation that terminated last week and the TA-50/54 resumption review report issued on January 10th. That said, the level of commitment seems to be increasing among DOE-EM (CBFO), NNSA, and LANL.

Authorization Basis (AB): LANL is pursuing the downgrade of two current nuclear facilities– the TA-8-23 Radiography Facility and the TA-21 Tritium Science and Fabrication Facility– to radiological status. This initiative is commendable from an overall risk-reduction perspective given that the age and condition of these facilities are less-than-ideal for continued long-term nuclear operations. However, the level of oversight by both LANL and the NNSA Site Office drops precipitously for facilities that are categorized as radiological. Increased attention to radiological facilities lab-wide appears warranted to ensure that residual risks are identified and addressed appropriately (site rep weekly 9/24/04).

NNSA Oversight: The Site Office facility operations group is implementing a periodic report system that should improve formal issue management on the federal side (site rep weekly 12/31/04).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 28, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 28,2005

Critical Experiments Facility (TA-18): Two recent reportable occurrences illustrate the continued problems at TA-18 regarding tracking and implementation of safety basis requirements. Specifically, a safety basis implementation plan milestone to characterize uranium solutions and an in-service inspection of the safety-class flood retention structure were not performed as required. The critique of the missed in-service inspection indicated that TA-18 had been inappropriately applying a 25% grace period to these activities. LANL is investigating whether the misapplication of grace periods is a lab-wide issue.

A previous non-compliance with compensatory measures has resulted in the suspension of TA-18 programmatic activities since mid-December. LASO is authorizing, on a daily basis, limited activities at TA-18 that support compliance with safety and security requirements. Commencement of programmatic activities has been contingent upon LANL's completion of an integrated and resource loaded operations plan that outlines how LANL intends to successfully execute these activities in a safe and compliant manner.

On Friday, LANL presented their operations plan for the Early Move programmatic activities. The projected completion date significantly exceeds the NNSA target date of September 2005. LASO has indicated that this plan provides sufficient information to justify resumption of Early Move activities, but that the schedule delays are unacceptable and that LANL needs to identify options to allow the NNSA target date to be met. LANL has committed to provide a revised plan by mid-March 2005. The fate of programmatic activities beyond Early Move and the degree of continued LASO involvement in work authorization for programmatic activities were not addressed.

Vital Safety Systems: LANL is pursuing standardization of its systems engineering program, applicable to both facility and programmatic work. While the contractor's program on the facility side has been moving forward, the programmatic side has evolved little and particularly needs more emphasis on adequate detachment between the systems engineering function and programmatic drivers. The NNSA safety system oversight program here is embryonic (similar to the LANL programmatic side) but has recently started to move forward.

Chemistry and Metallurgy Research Facility Replacement Project (CMRR): The CMRR project Critical Decision 1 (CD-1) package is currently being finalized for submission to the Deputy Secretary of Energy and the Energy Systems Acquisition Advisory Board. The estimated project cost is \$850M and encompasses both the primary nuclear facility and a supporting radiological laboratory. The scope for these facilities will meet the baseline project requirements but provide no mission contingency capability. Projected facility start-up is in late 2012. Completion and submission of the CD-1 package is awaiting LASO approval of the Preliminary Hazard Analysis and concurrence with the proposed location of radiological support laboratory; both of which are expected to be received by the first week in February. Project personnel are striving to submit the CD-1 package prior to the end of February to avoid approval delays associated with senior management turnover at DOE headquarters.

Radio-chemistry Laboratory (TA-48): On January 10th, a 19 year-old student dropped a wrench and shorted two batteries while working on a small un-interruptible power supply. Energy released melted one lead terminal and discolored another. LANL review of the event determined that work controls and training were inadequate (e.g., no integrated work document) and that institutional guidance on identifying the hazard class for this type of battery work is not definitive. This is the second safety-related event at TA-48 involving students working alone during the last 2 months (site rep weekly 1/7/2005).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 4, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 4, 2005

Resumption Status: LANL has largely completed site-wide resumption: operations have been assessed; numerous issues have been identified; pre-start findings (i.e., those indicating an unanalyzed risk or condition of imminent danger) have been addressed by either a compensatory measure or permanent solution. LANL is now moving, albeit slowly, into the longer-term corrective action phase.

Waste Operations: The LANL Director has approved resumption of TA-50/54 waste operations. The startup plan includes management field walk-down of procedures, documented resolution of issues, management presence for initial operations, and safety basis training for personnel. TA-50 transuranic liquid waste operations remain on hold pending caustic receipt tank replacement, expected in May.

Critical Experiments Facility (TA-18): On Friday, the LANL Director approved TA-18 resumption but without federal concurrence. NNSA has concurred in resumption or essential status for every other moderate or higher risk activity group, nearly 4 dozen total. Furthermore, for the first time since mid-December, TA-18 conducted operations Friday without federal concurrence in the plan-of-the-day.

LANL asserts that TA-18 pre-start issues have been addressed, except for LANL submittal and NNSA acceptance of an integrated, resource-loaded plan demonstrating TA-18 can safely and securely operate and meet priorities, particularly to be below the Security Category I/II threshold in September 2005 (i.e., Early Move). This deadline appears unachievable without extreme measures; LANL is concerned that the priority assigned to Early Move is impacting continued viability of TA-18 programs including the criticality safety and experiments program. NNSA asserts that the plan is necessary to ensure that TA-18 is focused on priorities and has adequate resources, supervision, and staff to conduct more than a few complicated operations without safety, security, or compliance issues arising; such issues have recurred at TA-18 and led NNSA to direct federal concurrence in daily operations (site rep weekly 12/17/04).

The site reps understand that LANL will conduct a readiness assessment per LANL requirements before resuming critical assembly operations and that LANL will formally resolve issues raised by the Board before conducting such operations with plutonium (i.e., those with Safety Class implications).

Plutonium Facility (TA-55): LANL has proposed and NNSA has approved additional compensatory measures to address vulnerabilities identified by the recent leak path factor re-analysis (site rep weekly, 1/14/05). LANL derived the new compensatory measures from a more complete evaluation of 18 postulated accident scenarios for TA-55. This drew upon the best information available, including process hazard analyses from the safety basis upgrade proposed in April 2002 but still unapproved. In parallel, LANL is pursuing clean up of the room contaminated with Pu-238 in August 2003 and restoring capability to pyrolyze and disposition combustible Pu-238 residues.

Authorization Basis: NNSA has directed LANL to upgrade the TA-55 Technical Safety Requirements (TSRs) by consolidating the controls from the following sources: unreviewed safety questions against the currently approved 1996 safety basis; hazard analyses from the proposed 2002 safety basis upgrade; analyses from the NNSA-LANL joint review team working on the safety basis upgrade; and the recent compensatory measures related to leak path factor. This TSR upgrade would enhance safe nuclear operations in TA-55 during the interim period before the full safety basis upgrade is completed.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 11, 2005

TO: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJ: LANL Activity Report for Week Ending February 11, 2005

The site representatives were at DNFSB-Headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 18, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 18, 2005

Matthews and Jordan were here this week reviewing Integrated Safety Management.

NNSA Management: The NNSA Site Office is reassigning for 120 days about a fifth of its workforce (i.e., 20 out of 110) to increase federal oversight of safety, infrastructure, laboratory corrective actions, and security. Details are in development, but it appears that most of the increase will be in facility operations and security oversight; other local federal functions will be cut-back. Properly establishing priorities and effectively matching redeployed workforce skills to actual oversight needs appear key to the efficacy of this initiative. The Site Office Manager intends to periodically evaluate effectiveness and adjust priorities and personnel accordingly.

Integrated Safety Management (ISM): LANL is beginning a long-term effort to improve their ISM implementation by training managers and supervisors in the Dupont "Safety Training Observation Program," also called STOP™. This training focuses on skills for observing and auditing workplace safety, reinforcing safe work practices, correcting unsafe acts and conditions. Emphasis is on management commitment and individual responsibility for safety. The management and supervisor training consists of 8 modules, a trial period, and a refresher module, all expected to take about 9 months. LANL then plans to roll out corresponding training for employees.

Critical Experiments Facility (TA-18): Last Wednesday (2/9/05), LANL resumed obtaining federal concurrence with what operations are conducted at TA-18 (site rep weekly 2/4/05). This week, LANL began to shift lead responsibility for all TA-18 operations to the Nuclear Materials and Technology (NMT) Division, which previously played only a support role at TA-18 and only in the Early Move Project. NMT brings significant operational and fissile material shipping/handling expertise to this effort; however, this reassignment by itself doesn't resolve apparent resource constraints, nor does it address competing mission priorities. The latter now not only includes long-term viability of the criticality safety program, but also potential impacts to other NMT missions. LANL plans next month to submit to NNSA a resource-loaded plan for TA-18 activities.

Authorization Basis (AB): LANL senior management has approved centralizing institutional safety basis authority, as NNSA and LANL described to the Board in August 2004 (site rep weekly, 8/20/04). This authority will fall within the Performance Surety (PS) Division. The objectives include ensuring that appropriate priorities are established, that AB documents adhere to an institutional standard of quality, and that adequate training is provided to safety analysts. Under this arrangement, individual safety analysts will meet institutional standards but remain within their respective line organizations.

Tritium Facilities: TA-21 (TSFF) is resuming neutron tube target loading operations as an essential activity; LANL plans to also conduct a lab readiness review per the resumption process. Planning continues for transferring this mission to Sandia. NNSA has also accepted a LANL proposal to remove tritiated waste from TSFF under a partially implemented safety basis. A proposal to downgrade TSFF to radiological status is expected by September 2005 (site rep weeklies, 12/3/04, 1/21/05).

Training: NNSA has completed a performance-based training assessment at LANL in response to a Board letter (7/9/03) on all NNSA sites (site rep weekly 9/17/04); the report is expected in March.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 25, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 25, 2005

Management: The NNSA Source Evaluation Board for the LANL contract competition is seeking authority to extend the current contract by 180 days (i.e., to nearly the end of March 2006). This is to allow (a) the successful bidder to propose a substantially equivalent benefits package, (b) NNSA to evaluate the package, and (c) current employees appropriate time to evaluate their options. A longer transition may increase uncertainty for some; on the other hand, if this is done right, it could reduce the very real potential for momentary worker distractions and lapses affecting safety during this period.

Integrated Safety Management: LANL managers responsible for plutonium, tritium, and radiography operations are beginning a sequence of courses on human performance elements, developed by the Institute of Nuclear Power Operations (INPO). The training is compelling in communicating its key points, including that even the best make mistakes; most human-factor-related events are due to latent organizational weaknesses; error-tolerant organizations focus on learning from such events rather than assigning blame; and such organizations develop processes with defense-in-depth against human errors.

Plutonium Facility (TA-55): Based on bioassays, TA-55 has identified four individuals who may have received possible Pu-238 uptakes while working in a Pu-239 lab room last June (site rep weekly 12/10/05); some gloveboxes in the room have legacy Pu-238 contamination. The most-recent dose estimates have central tendencies below 5 Rem CEDE. The estimates tend to decrease during followup bioassays.

The sequence of events is as follows. In June 2004, one of 52 fixed-head air samples in the room was high. A glove-box glove was found with a pin-hole leak. Nine employees working in the room submitted special bioassays. In July, another employee self-identified he had been in the room and submitted a kit. In December, bioassay results became available; reasons for the delay are being addressed. Initial results for the self-identified employee were high but dropped during followup sampling. Upon further review, TA-55 identified 28 people who were in the room during the week of the high fixed head sample. Initial bioassay results from this larger set have identified three other individuals who may have received a Pu-238 uptake. Detailed radiological surveys in the room have identified a capped copper vent line that had a small amount of loose Pu-238 contamination, which may or may not be the cause; the line runs under a glove-box line and is connected to Zone 1 ventilation. Other than the delay in bioassay analyses, LANL appears to have followed their procedures in responding to this event; however, the sparse workplace indicators (e.g., no positive nasal swipes) and the apparent lack of motive force to spread contamination are curious.

Waste Operations: During the last two months, TA-54 Area G has received transuranic waste drums from TA-55 (~1,400 Ci), temporarily alleviating TA-55 solid waste inventory issues (site rep weekly 1/14/05). LANL also appears on track to resume WIPP shipments in mid-April. One constraint may be NNSA and LANL achieving timely resolution of open safety basis issues involving the seismic capacity of the TA-54 RANT facility, which is used for loading TRUPACT shipping containers.

During the next seven months, TA-55 would like to ship another roughly 4,000 Ci to TA-54 to make vault space for TA-18 Early Move and to meet Secretarial commitments to the Board under Recommendations 94-1/00-1 (i.e., for direct discard of excess material). The constraint here was the TA-54 safety basis material-at-risk limit. NNSA has approved changes to the Technical Safety Requirements (TSRs) that credit robust packaging of sealed sources from the Off-site Source Recovery Program; these changes may provide sufficient operating margin for TA-54 to receive these shipments. This risk-balancing between TA-54 and TA-55 warrants continued close monitoring through this fiscal year and beyond.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 4, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 4, 2005

Bamdad, Jones, Jordan, and March were here this week reviewing fire protection, emergency response, TA-55 safety analyses, and CMRR project status. Also this week, NNSA, LANL, and the state of New Mexico signed a legally-enforceable consent order for environmental investigation and cleanup by 2015.

Fire Protection: At all but one LANL nuclear facility (TA-18), the highest-consequence nuclear accidents that NNSA and LANL have postulated involve fire. LANL has insufficient engineering staff to address fire protection issues, resulting in slow updates to fire hazard analyses (FHAs), incomplete action on FHA recommendations, and insufficient attention to timely and systematic analyses of trends. Furthermore, NNSA and LANL still need to address fire response staffing issues identified in a baseline needs assessment completed last June. A recent LANL reorganization and new management may elevate the visibility of fire protection issues and expedite LANL fully addressing these needs.

Critical Experiments Facility (TA-18): LANL is conducting Early Move activities and is considering uranium-based critical assembly operations without a clear authorization basis; NNSA appears to have informally accepted this situation. NNSA approved a TA-18 safety basis and its implementation plan in 2002 and amended both in 2003, assuming continued operation. During the last year, TA-18 has fallen behind on implementation, most notably for the safety-class temperature-based scram. Also, as part of implementation, TA-18 grayed-out sections of the technical safety requirements (TSRs) that were not yet implemented. These sections have not been updated, confusing operators on what is actually implemented and leading them to miss requirements, such as in-service inspections. LANL has not proposed nor has NNSA formally accepted the risk of TA-18 operating under these conditions.

Plutonium Facility (TA-55): TA-55 has no credible safety-class control to address a number of low-probability, high-consequence accident scenarios, since recent LANL analyses have shown the approved strategy based on passive ventilation is ineffective. This ought to be among the top 3 high-consequence nuclear safety issues at LANL, considering TA-55's enduring mission, its inventory and processes, its significant Pu-238 hazard, and its proximity to the public (site rep weeklies 12/24/04, 1/14/05, 2/4/05).

NNSA recently approved compensatory measures to address this; however, none of the compensatory measures qualify as safety-class, they are still being implemented, and they should not be relied on by themselves for an extended period. NNSA and LANL anticipate that within a month, LANL will propose and NNSA will take action on a set of interim TSRs that will address this and other known TA-55 safety basis issues for a longer period, such as a year. NNSA committed to specifying explicit functional classification, including safety-class assignments, and to specifying a time-limit for how long the interim TSRs are in effect. NNSA and LANL have struggled for years to correct TA-55 safety basis issues, and now the high priority assigned to TA-18 Early Move may interfere with timely resolution.

Longer term, NNSA and LANL may need to consider a suite of safety-class controls including active ventilation. Based on highly sophisticated analyses, LANL concluded that passive-mode building leakage is high and can vary widely (i.e., 20 to 70%). While the trends appear correct, the model is unrealistic and highly conservative. The selections of assumptions and possible solution strategies also

show a bias against considering active ventilation. For example, only 1 of 9 analytical cases presented had active ventilation; interpretation is difficult because this case also had time-limits on external door openings. This case was the most effective of those presented at minimizing building leakage (10%).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 11, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 11,2005

Feldman and Massie were here this week to discuss status of LANL support for the Pit Disassembly and Conversion Facility. Shackelford was also here observing NNSA sponsored training on specific administrative controls, conducted per a DOE commitment under Recommendation 2002-3.

Operational Efficiency (OE) Project: LANL intends that the OE Project would address many of the institutional post-start findings identified during the resumption reviews. Within the last week, NNSA and LANL have agreed to a OE project execution plan, and LANL has prepared a baseline. The project includes 8 main elements: safety, quality assurance (QA), software QA, conduct of engineering, safety basis, operations, environmental risk management, and training. LANL management appears dedicated to executing this multi-year program, which could systematically reduce a broad spectrum of LANL safety risks and address several issues raised by the Board.

Radioactive Liquid Waste Treatment Facility (RLWTF): Last Thursday (3/3), two workers were exposed for an hour to unexpectedly high airborne contamination levels. This may have resulted in Pu uptakes since the respirators they were wearing do not offer protection commensurate with the high airborne levels found after the job was done; bioassay results are expected next week.

The workers were cleaning up paint chips in an underground vault, in preparation for the leaking caustic tank replacement. Respirators were being used based on previously seen conditions in the vault. The radiological controls technician (RCT) conducting the exit frisks found contamination levels an order of magnitude higher than he expected on their respirator cartridges and several orders of magnitude higher than previously seen on the fixed head air sample, which was the only air monitoring conducted in the space. NNSA and LANL are pursuing questions regarding this event, such as the cause for this unexpected increase in airborne contamination level, the future use of engineered controls to minimize and monitor airborne contamination, and the level of subject matter expert review for these types of jobs. Careful followup is in order, including careful radiological characterization of the vault to determine the cause and best path forward for recovery.

Plutonium Facility (TA-55): This week, work has commenced on the recovery of Room 201B, which was contaminated with Pu-238 in August 2003 (site rep weekly, 2/4/2005). The contamination resulted from a breached residue can and led to a Type B uptake event. The current clean-up phase includes over-packing approximately 180 Pu-238 residue cans into filtered plastic bags and completing room decontamination. To date, 38 of the residue cans have been bagged (20%). Execution of the next phase of recovery, which entails over-packing the bagged residue cans into Type A 55 gallon drums with an additional filtered plastic drum lining, is contingent on a laboratory readiness review and is expected to begin in mid-April. This progress is encouraging and completion of these activities will significantly reduce the risk-profile at TA-55.

Unfortunately, progress on related institutional corrective actions associated with the Type B contamination event, including site-wide nuclear material packaging improvements, has not kept pace. These initiatives continue to languish as necessary resources have been redirected to support the TA-18 early move project.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 18, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 18, 2005

LANL was closed Monday and Tuesday due to snow.

Management: NNSA intends by June 30th to verify that 100% of the pre-start findings from the LANL resumption reviews are either closed or have adequate compensatory measures in place. LANL management and lab readiness assessment teams performed a similar verification prior to resumption. Given the importance of fully resolving the pre-starts, this second-check appears worthwhile. Longer-term, NNSA intends to also confirm by sampling that local corrective actions are adequate.

Radioactive Liquid Waste Treatment Facility (RLWTF): Last Friday, LANL began a formal investigation into the two workers exposed to unexpectedly high airborne contamination (site rep weekly 3/11/05). The investigative team expects to report its findings in mid-April.

Chemistry and Metallurgy Research Building (CMR): Earlier this month, NNSA assessed the implementation of CMR safety system requirements by tracking from the 1998 basis of interim operation (BIO) down to system documentation and surveillance procedures. As part of this review, both NNSA and LANL found inconsistencies in the current safety basis, particularly for Wing 9 hot cell interlocks and contamination confinement features and for a ventilation functional test that is vaguely described in the BIO. LANL believes that they have met the intent of the safety basis and that the safety basis revision submitted last April for CMR will resolve these problems.

Unreviewed Safety Questions (USQ): LANL is reviewing all negative USQ determinations (USQDs) dating back to April 2001 in response to NNSA concerns on inadequate implementation of the USQ process at the lab (site rep weekly, 9/24/04). About 16 % (253) of the +1,500 negative USQDs in this set have been reviewed. Six of the reviewed USQDs (i.e., ~3%) appear to have been mis-characterized as negative and should have been positive. Common implementation problems identified so far include: poor understanding of the margin-of-safety concept; inadequate bases for answers to USQD questions; and re-cycling of previous USQDs without adequate consideration of their applicability to new situations. LANL expects to complete this review by early-July.

Waste Operations: NNSA has approved TRUPACT loading operations at the TA-54 RANT facility on an interim basis (site rep weekly, 2/25/05). This approval expires August 1, 2006 and is contingent upon implementation of several compensatory measures to address seismic vulnerabilities, including: additional bracing for facility equipment; in-situ testing of over-head appurtenances; and material-at-risk limitations. LASO indicated that a major factor in approving these operations was the significant risk-reduction benefit associated with removing high-curie waste drums from TA-54 to WIPP. With this approval, LANL anticipates commencing Quick-to-WIPP shipments by mid-April. To address the long-term viability of the RANT facility, LANL has indicated that they will initiate a project to make the permanent facility modifications necessary to eliminate identified seismic vulnerabilities.

Quality Assurance (QA): LANL has proposed and NNSA is now reviewing a lab-wide QA program and implementation plan. LANL does not have a DOE approved QA program and has reported this as a non-compliance with the QA provisions in the Nuclear Safety Management Rule (10 CFR 830).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 25, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 25, 2005

Burns was in Albuquerque at the Pantex Focus Meeting on Thursday and at Sandia on Friday.

Waste Operations: NNSA and LANL believe they are on track to resume WIPP shipments in mid-April. By resuming these shipments (suspended in Oct 2003), LANL would begin to reduce the risks due to the highest consequence nuclear accident postulated at LANL in approved safety analyses.

Authorization Basis (AB): NNSA and LANL have approved a new set of authorization agreements (AAs) that lists the applicable AB documents for nuclear facilities. LANL has committed to updating AAs within 30 days of AB changes. Management intends to annually approve a consolidated update, next due on 1/31/06. This addresses an issue in the Board letter and staff report of 5/27/04.

Conduct of Engineering: The LANL Engineering Practices Council (EPC) held its first meeting this week and is intended to serve as the institutional authority for establishing and maintaining consistent engineering processes, policies, and procedures. FY-05 goals include interim qualification of system engineers for all LANL vital safety systems (~90), and issuance of approved institutional engineering procedures in the following key areas: screening for engineering work, design change packages, management level determinations, engineering equivalency, design information development, post-modification testing, independent external design reviews, and design adequacy and back-fit analyses. An effective EPC could help LANL resolve issues in the Board letter and staff report of 1/27/04.

Chemistry and Metallurgy Research Replacement Facility Project (CMRR): NNSA has approved the CMRR Preliminary Hazards Assessment (PHA) in support of Critical Decision-1. Nine conditions of approval (COAs) were imposed, covering issues such as little evaluation of chemical hazards, non-conservative assumptions (e.g., airborne release fractions) for certain scenarios, questionable criteria for determining the significance of potential worker exposures, and defensibility of the proposed safety-class passive confinement strategy. NNSA agreed with LANL pursuing active ventilation as safety-significant at this stage, which is counter to Board Recommendation 04-2.

NNSA tasked the project to perform a detailed cost-benefit analysis between active and passive confinement and other control options, such as fire suppression. While NNSA acknowledged the difficulty in technically defending a passive confinement strategy, NNSA expressed concerns that active confinement may exacerbate certain scenarios resulting in unintended hazards and incurring excessive life-cycle costs. Citing a preference for preventive over mitigative and passive over active controls, NNSA indicated that a combination of fire barriers and fire suppression needs to be explored as an alternative safety-class control. The merits and significance of these concerns are unestablished.

Plutonium Facility (TA-55): NNSA has extended the interim AB approval for rm 201B cleanup, which would have expired next week (site rep weekly 11/12/04). Impact of new conditions of approval are unknown. These include NNSA approval of interim Technical Safety Requirements (TSRs) to address the leak path issue and LANL implementation of those interim TSRs applicable to the cleanup.

NNSA has released LANL to design and construct trailer storage pads and a weather cover to support TA-18 Early Move. NNSA designated the pads and trailer anchor system as safety-class, the trailer shelving system as safety-significant (seismic/wind performance category: PC-3), and the weather cover lightning protection system as defense-in-depth. NNSA plans to act on a LANL proposed interim safety basis for this operation after additional safety analyses are submitted.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 1, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 1,2005

Plutonium Facility (TA-55): NNSA has clarified that conditions of approval issued last week are not intended to interrupt room 201B cleanup; this high-priority risk reduction activity is continuing.

NNSA and LANL need to establish the safety-class control(s) they intend to rely on in place of passive ventilation and thereby address a number of low-probability, high-consequence accident scenarios. LANL has proposed interim Technical Safety Requirements (ITSRs) to define the safety envelope until the final safety basis upgrade is done, which could be a year. The ITSRs are intended to address the leak path factor (LPF) issue in the short-term, as well as consolidate controls from the following: unreviewed safety questions against the currently approved 1996 safety basis; hazard analyses from the proposed 2002 safety basis upgrade; and analyses from the NNSA-LANL joint review team working on the safety basis upgrade (site rep weeklies 2/4/05, 3/4/05).

The LANL submittal included refined LPF calculations, intended to quantify relative performance of the existing active confinement ventilation system. The analyses indicate that with the west exit doors open and the east exit doors closed, wind tunnel effects are precluded and the active ventilation system limits facility releases to less than 0.02%; two orders of magnitude lower than the best case estimates for passive confinement. Given that the PF-3 administrative building completely encloses the eastern exit doors, this analysis appears to be a reasonable representation of the actual facility configuration.

Citing a lack of quantitative data on PF-3's effectiveness as a wind-block and uncertainties about the potential costs of equipment upgrades, LANL has chosen not to pursue active ventilation as a safety-class control at this time. Instead, LANL proposes a combination of process-specific design features and administrative controls as a safety-class defense. NNSA review and additional LANL studies are underway.

Management: The NNSA Site Office and LANL have increased emphasis on responding to the Board on several late commitments and reporting requirements. Within the last week, they have issued responses on conduct of engineering (Board letter 1 /27/04); identification of critical admin controls (Rec. 02-3, commitment 4.5); roles and responsibilities for weapons points-of-contact (Rec 02-2, commitment 4.3.2); and TA-55 ventilation backup power (DOE commitment, Pu ventilation system study report, 3/15/96). The staff is reviewing these responses. NNSA still owes responses on a training assessment, which is nearly done, and on TA-18 temperature-based scram systems, which is waiting on NNSA to decide what critical assembly operations are required in the remaining time.

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL appears on track to complete in mid-April the investigation into the RLWTF high-airborne contamination event (site rep weekly 3/11/05). Preliminary bioassay results indicate that the two workers received measurable but low internal exposures; these will likely be below the reporting threshold (500 mrem).

Fire Protection: LANL is increasing staffing and funding in FY-05 and 06 to address fire protection issues, including beginning to address fire hazard analysis updates and planning a response to the fire department baseline needs assessment (site rep weekly 3/4/05).

Radiography Facility (TA-8-23): LANL has secured operations in TA-8-23 and will propose to NNSA that it be downgraded from a HC-2 nuclear to a radiological facility (site rep weekly 11/12/04).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 8, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 8, 2005

Keilers was off-site this week.

Management: The LANL Corrective Action Review Board (CARB) met for the first time last week. The CARB is intended to oversee and guide corrective action management processes for both local and institutional issues identified during the resumption reviews. It will report to the LANL Director, consist of several LANL senior managers and non-voting NNSA reps, and function similarly to the largely successful LANL Resumption Review Board (RRB). With sustained management commitment, the CARB could become the key mechanism for ensuring that laboratory corrective actions are consistent, complete, sustainable, and effective (site rep weekly 12/31/04).

Chemistry and Metallurgy Research Building (CMR): This week, NNSA rejected the safety basis upgrade (BIO and TSRs) for CMR submitted by LANL in September 2004. More than 75 significant comments were provided to LANL for resolution and NNSA believes that the time required to adequately address these comments will be extensive. Given the age of the current CMR safety basis documents (circa 1998), NNSA is uncomfortable with relying on these for an extended period of time while the final safety basis upgrade is revised.

Consistent with the approach taken recently at TA-55 (site rep weekly, 4/1/2005), NNSA has directed LANL to develop a set of interim TSRs to support operations until the final safety basis upgrade is completed. In developing the interim TSRs, LANL has been directed to draw upon the best available information, including all unreviewed safety questions and hazard analyses produced for CMR since 1999. Additionally, no controls from the current safety basis are to be eliminated or downgraded. The due date for submission of the interim TSRs is August 31, 2005.

HEPA Filter Program: LANL has initiated a high level review of the laboratory's processes for ensuring the quality of HEPA filters used in safety-related applications. The review is assessing protocols for procurement, storage, installation, testing, and disposal. There is currently no institutional program for managing safety-related HEPA filters, and preliminary results indicate that the formality of the disparate divisional programs is weak, especially regarding storage of filters prior to installation. LANL expects to complete the review and issue a final report before the end of the month.

Critical Experiments Facility (TA-18): Early move activities continue with NNSA approving work on a monthly basis. Overall operational performance has improved since Nuclear Materials Technology Division took custody of the facility (site rep weekly, 2/18/05). This week, an operations center has been established to improve facility work control and more formally track execution of safety basis requirements. Efforts to clarify the implementation status of the currently approved safety basis and identify the control set necessary to support early-move and anticipated programmatic activities are on-going (site rep weekly, 3/4/2005).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 15, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 15, 2005

Waste Operations: This week, LANL made its first transuranic waste shipment to WIPP since October 2003; it consisted of 19 Quick-to-WIPP drums. Near-term, it appears that LANL and the WIPP contractor may achieve 1 shipment per week; however, WIPP shipments could be delayed by a plethora of open safety basis issues. These waste operations lack an integrated risk evaluation. The most effective risk reduction mechanism available is to ship the waste (site rep weekly 12/5/03). NNSA and LANL could consider the limited remaining life of these operations and streamline the controls with the goal of optimizing overall rate of risk reduction.

Plutonium Facility (TA-55): In support of their review of the recently submitted interim Technical Safety Requirements for PF-4 (site rep weekly, 4/1/2005), NNSA has requested that LANL provide a backfit analysis within 90 days characterizing the cost/benefit implications of upgrading the current active confinement system to meet Safety Class requirements. NNSA expects this analysis to clearly articulate the cost differences between upgrading to Safety Significant and Safety Class, respectively. The usefulness of this analysis could be enhanced by first defining what the necessary and sufficient requirements should be for upgrading an existing system.

TA-55 has identified that several employees received measurable Pu-238 uptakes while working in a Pu-239 lab room last June and that one of these received 800 mrem 50-yr CEDE, exceeding the 500 mrem reporting threshold. Investigation continues (site rep weekly 2/25/05).

Facility Management: Many of last year's resumption reviews identified issues involving the roles and responsibilities for facility operations management, as well as needs for standardized tools and appropriate support for the facility management function. A LANL team has thoroughly studied these issues and, this week, made recommendations to LANL senior management. Squarely addressing these issues is necessary for success in the resumption followup; in fact, addressing these issues appears to be a prerequisite for the Operational Efficiency (OE) Project (site rep weekly 3/11/05).

Issue Management: LANL has observed a growing number of late corrective actions intended to respond to resumption review findings; appropriate management attention is being applied on reversing this trend. The LANL Corrective Action Review Board (CARB) is developing its strategy for providing the LANL Director independent assurance that these corrective actions were properly identified, implemented, and sustainable. With continued management support, the CARB could provide a stronger feedback mechanism between identified issues and their corrective actions than previously existed at LANL. Success also hinges on the distributed network of LANL issue management coordinators that will support the CARB in its activities.

Critical Experiments Facility (TA-18): LANL has submitted the start-up notification report (SNR) for resuming critical experiments with uranium on the Planet machine. The SNR requires documentation of the applicable safety controls for these experiments; resolution of issues identified in the Board's letter of July 9, 2003; an independent laboratory readiness assessment; and NNSA restart approval. This deliberate restart approach appears acceptable from a safety basis and operational perspective. From a programmatic priority perspective, LANL will also be required to demonstrate minimal impacts to the Early Move project prior to commencing Planet operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 22, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 22, 2005

Critical Experiments Facility (TA-18): NNSA-HQ issued correspondence to the LASO site manager and LANL director outlining the priorities relative to work at TA-18 for the remainder of this fiscal year. First and second priority are to be given to work supporting the Early Move (EM) and Critical Experiments Facility (CEF) projects, respectively. Third priority is given to high-importance programmatic work which includes the following criticality experiments: a uranium-based Planet experiment supporting the National Aeronautics and Space Administration's space reactor program, uranium-based experiments on Planet and Sheba supporting the DOE nuclear criticality training program, and an experiment on Comet supporting emergency response programs. NNSA-HQ reiterated the importance of the critical experiments and its expectation that they can be performed this fiscal year in concert with the higher priorities. LASO concurrence with all programmatic work will continue to be required to ensure impacts to EM and CEF are minimized.

Plutonium Facility (TA-55): On Tuesday, NNSA rejected the interim TSRs submitted by LANL on March 23, 2005. Though stating that this was one of the best safety basis documents submitted by LANL, NNSA indicated that several comments, primarily dealing with insufficient specificity in Limiting Conditions for Operation statements, needed to be addressed prior to approval. The rejection memorandum made no mention of the NNSA position regarding implementation of a safety-class active confinement ventilation system to address vulnerabilities associated with the previous passive confinement strategy (site rep weekly, 4/1/2005).

Plutonium-238 Operations: LANL priorities for TA-55 Pu-238 operations are (1) recover the room contaminated in August 2003 and (2) startup the full-scale aqueous scrap recovery line, preferably by late August 2005; LANL is rebaselining these efforts. Plans for the latter include full readiness verification, which would address a previous issue (site rep weekly 8/1/03). Progress on the former requires LANL to next verify compensatory measures are in place for getting residue cans into drums and out of the room. In parallel, DOE-NE is considering if low-inventory cans can be disposed as waste instead of retained to recover the Pu-238. This would be beneficial since about half the cans in the room (~120 of 238) plus about 20 others in the vault may qualify for WIPP. Many of the other cans are higher-inventory cans with rags and combustibles. These residues require pyrolysis, which is not expected to resume before October. Pyrolysis appears key for significant risk reduction since cans in this population also contain about half of the room's inventory by mass of Pu-238.

Integrated Safety Management (ISM): LANL has had several occurrences recently in non-nuclear facilities that indicate worker safety issues continue to warrant elevated management attention. These include uncontrolled electrical hazards and improperly assigned respiratory protection levels.

Radiography Facility (TA-8-23): NNSA has approved downgrading TA-8-23 from a hazard category 2 nuclear facility to a radiological facility pursuant to inventory restrictions limiting nuclear material to less than 0.5% of hazard category 3 thresholds (site rep weekly 4/1/05).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 29, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 29, 2005

Electrical Safety: LANL has had 3 or 4 electrical safety occurrences in each of the last 4 months. All have been from non-nuclear activities; recently, they involved subcontractors and lock-out tag-out violations. LANL has included improving the lock-out tag-out program as part of the long-term Operations Efficiency (OE) Project. NNSA has directed LANL to analyze the electrical safety situation and take decisive action within 7 days; if inadequate, NNSA stated it may impose a limited shutdown.

Quality Assurance: LANL has determined that personnel performing receipt inspections were deviating from procedure; at this time, it appears that material control, traceability, and segregation were preserved. Separately, LANL has identified a concern that personnel using measurement and test equipment having a limited calibration may have misunderstood the implications of the limited calibration and misapplied the equipment. LANL has done an initial survey of the use of such equipment and believes there are no major impacts. LANL is still investigating both these concerns.

Management: Except for hydrotests, NNSA has finished verifying that pre-start findings from LANL resumption reviews are either closed or have adequate compensatory measures in place (site rep weekly 3/18/05). On Wednesday, the NNSA team reported that they had agreed with LANL on closure status of 368 of 376 pre-starts (i.e., 98 %). Five of the eight open pre-starts are related to nuclear operations (e.g., TA-50/54/55); these specifically involve integrated work management and work control.

In the last two weeks, LANL has cut in half the number of late corrective actions intended to respond to resumption review findings; LANL expects a further one-third reduction within the next week (site rep weekly 4/15/05). During the next 2 months, LANL plans to make organizational changes intended to address findings involving operational roles and responsibilities. Addressing these issues appears to be a prerequisite for continued progress on the OE Project.

Radioactive Liquid Waste Treatment Facility (RLWTF): On Friday, LANL briefed NNSA on results of its investigation into the 3/3/05 event involving workers at RLWTF exposed to unexpectedly high airborne contamination levels (site rep weekly 3/11/05). This event led to 4 workers receiving low-level Pu-239 uptakes; current dose estimates are all less than 50 mrem CEDE, which is 10 % of the DOE occurrence reporting threshold (500 mrem) and 1 % of the federal annual limit for rad workers (5 Rem).

LANL's investigation revealed work control weaknesses during an event that fortuitously had negligible health consequences. The investigation team concluded that the hazard analysis and the selection and implementation of controls were inadequate. Their report indicates that the direct cause was 2 inexperienced workers squeezing air out of bags of debris, creating a puff release that highly contaminated their protective clothing; then during doffing, contamination became airborne and was inhaled by 4 workers. The root cause was failure at multiple levels to recognize that this was a complex, non-routine job. The report indicates incomplete implementation of integrated work management: during planning, hazards were estimated rather than measured; work-scope and radiation hazards changed after the work control documents were prepared; the workers were not trained and qualified for the new work-scope; job suspension limits and engineered controls were not used; abnormal conditions during earlier vault entries were missed, including unexpectedly high radiological indicators; and the controls that were specified were incompletely implemented. A corrective action plan is expected in May.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 6, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 6, 2005

Management: UC has named R. W. Kuckuck as interim LANL Director, effective May 16th.

Waste Operations: Certain TA-54 waste characterization operations (i.e., high efficiency neutron counting and real-time radiography) currently require handling drums about 1.5 feet higher than their maximum certified drop height of 4 feet. Since the drums are a credited safety feature, LANL identified this as a potential inadequacy in the safety analysis and then implemented compensatory measures. LANL plans to resolve this by lowering the equipment to below the drum's certified drop height. NNSA has approved continued operations under the compensatory measures until no later than May 20; however, modifications to lower the equipment may not be complete until mid-June. Cessation of characterization for nearly a month would significantly hamper LANL's ability to ship waste to WIPP and does not appear to be in the best interest of overall risk reduction at the lab.

Radioactive Liquid Waste Treatment Facility (RLWTF): In response to the investigation reported last week, LANL is taking actions, such as: stop non-routine radiological work in the affected division pending review for and correction of integrated work management deficiencies; review related work to determine if the resumption startup plan was effectively implemented; ensure the facility's perspective of the event is heard and evaluated; and review the investigation report to identify higher-tier management concerns and the state of compliance with the worker radiation protection rule (10 CFR 835). LANL's actions appear appropriate. LANL should be commended for a thorough investigation.

Electrical Safety: As a result of events discussed last week, LANL held a mandatory 2-hour training session this week; it was effectively given. LANL is also increasing the electrical safety training opportunities for its work force. Electrical safety will likely continue to challenge LANL because of the large site-wide electrical work-scope and the age and condition of facilities.

Plutonium Facility (TA-55): To expedite removal of security category I/II nuclear materials from TA-18, NNSA has approved temporary staging of these items in three safeguarded (SST/SGT) trailers at TA-55 prior to completion of the trailer tie-down pads. NNSA is requiring that the staged items be in certified DOT Type B shipping packages and that the storage duration be limited to seven months.

Critical Experiments Facility (TA-18): NNSA has approved the start-up notification report (SNR) for uranium-based critical experiments on the Planet machine (site rep weekly, 4/15/05). LANL is using a deliberate approach to resume this operation, which includes a management self-assessment (MSA) that started this week. An independent laboratory readiness assessment is scheduled for the week of May 16. The first operation is currently expected during the week of June 13.

Issue Reporting: High-reliability organizations have processes that reward the discovery and reporting of errors (ref: DNFSB/TECH-35, Dec 2004). LANL has improved at self-identification and reporting of issues in the last few years. For example, the PAAA system has become one of the most effective systems at LANL for identifying and tracking closure of nuclear safety issues; LANL internally reviewed more than twice as many issues for PAAA applicability in 2004 than in 2001 (i.e., 343 vs 151); comparing the same years, the percentage of PAAA reports resulting from assessments instead of occurrences increased from 4 % to 66 %. Recent feedback (e.g., on the RLWTF investigation) does not positively reinforce this trend; instead, it could lead to suppression of reporting and thoroughly investigating issues, making it ultimately more difficult to identify and correct safety issues.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 13, 2005

TO: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Activity Report for Week Ending May 13, 2005

The site representative was at DNFSB-Headquarters in Washington, D.C. This report is submitted for continuity purposes only.

cc
Board Members

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 20, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 20, 2005

Management: On Thursday, NNSA issued the request for proposal for the next LANL contract (site rep weekly 2/25/05). Key dates are: proposals due - July 19; contract awarded - December 1; contract begins - June 1, 2006. The new contract would run 5 to 20 years. Maximum annual fee that could be earned may jump nearly an order of magnitude compared to the current contract (\$8.7M vs \$79M).

Chemistry and Metallurgy Research Building (CMR): CMR had a contamination release to a lab room last Thursday (5/12) that may result in Pu-239 uptakes by one to four workers; preliminary bioassay results will be available in a few weeks. The workers were introducing bag-out material into a glovebox line when contamination was detected on a worker's gloves; within minutes, the continuous airborne monitor alarmed, and the workers evacuated. The workers were in anti-C's but were not in respirators. Followup actions taken were appropriate. CMR is reviewing the event for lessons learned, including adequacy of procedures and controls and applicability to other operations.

Chemistry and Metallurgy Research Replacement Facility Project (CMRR): On Wednesday, the Deputy Secretary approved Critical Decision 1 (CD-1 – start of preliminary design) for CMRR, as well as CD-0 for CMR decontamination and decommissioning. NNSA owes the Board a briefing within 30 days of CD-1 approval on the rationale for using a design-build approach and on its plan to ensure adequate NNSA and LANL technical staffing for preliminary design (ref: Board ltr, 2/24/05).

Critical Experiments Facility (TA-18): Early Move activities appear to be on track to de-inventory TA-18 to below the Security Category I/II threshold in September. This is receiving high priority.

The management self-assessment report for Planet uranium-based critical assembly operations is in preparation. Tentatively, there are several pre-start findings; the most challenging pre-starts involve clarifying the safety basis to avoid operator confusion (site rep weekly 3/4/05). Clarifying the safety basis warrants priority if the limited scope of Planet operations envisioned are to occur safely, deliberately, and within the time remaining. This ought to be achievable.

Emergency Management: Several assessments during the last year have identified issues with LANL emergency management (ref: site rep weekly 12/3/04). LANL is also implementing the National Incident Management System (NIMS). NNSA and LANL met this week and have developed a path-forward to address the issues and to verify progress during upcoming emergency exercises.

Waste Operations: LANL is proposing continued use of conveyors for moving a single drum at a time during certain characterization activities; the conveyors place the drum at 5 to 7 feet elevation, which is above the drum maximum certified drop height of 4 feet (site rep weekly 5/6/05). By December, LANL intends to lower the characterization equipment (i.e., trailers) as the permanent solution. Acceptance increases the likelihood LANL can keep transuranic waste shipments to WIPP on schedule. These shipments are LANL's principal mechanism for reducing the risks associated with the highest consequence nuclear accident postulated at LANL in approved safety analyses.

Tritium Facilities: TA-21 (TSFF) has reduced its tritium inventory to below the Hazard Category 3 nuclear facility threshold; subject to NNSA verification, it will be downgraded to a radiological facility. Neutron Tube Target Loading operations continue pending transfer of that mission to Sandia.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 27, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 27, 2005

Jordan and Plaue were on site this week reviewing startup preparations for the new Pu-238 aqueous scrap recovery line. Burns is off-site until the week of June 13th.

Pu-238 Operations: The schedule leading to startup of the new Pu-238 aqueous scrap recovery line is: LANL readiness assessment (RA) starts next week; NNSA RA would be in July; and startup would be in August. As discussed in the Board's letter of August 1st, 2003, Pu-238 is the dominant source term in TA-55 glove-box operations, and any future upset involving Pu-238 in this unique facility could adversely affect the health and safety of the public, the workers, and the environment, as well as national security. For perspective, LANL analyses indicate that inhaling one or two 2-micron diameter particles of Pu-238 oxide (i.e., about the ICRP default size) results in 0.5 Rem CEDE dose. Aqueous processing of Pu-238 is a particular concern since it results in more particles of respirable size than nearly all other operations; this increases the potential consequences from certain upsets.

NNSA and LANL have worked for years to develop appropriate controls for this increased hazard; some issues remain. The LANL RA team appears qualified and independent (4 of the 9 members are from SRS); it plans to examine both closure of previous Board issues and readiness. NNSA's RA team is undefined, and NNSA's level of commitment to a thorough federal review is unclear at present.

Following startup, TA-55 may have to operate the new line at the advertised sprint rate (8 kg/yr) for two years if they are to meet customer needs. For relief, they intend to also run the manually-intensive bench-scale line to produce about 3 kg/yr through 2007. Both a fast, early operating tempo for the new line and the extensive use of bench-scale for production would have significant safety implications.

Plutonium Facility: NNSA has approved two new Hazard Category 2 nuclear facilities at TA-55: (1) the safeguarded trailer pad and cover to support TA-18 Early Move for 5 years and (2) a metal shed (PF-185) to store unirradiated mixed oxide fuel within shipping containers for 4 years. Accident analyses indicate that both have unmitigated off-site consequences below the evaluation guideline.

NNSA is requiring that Operational Readiness Reviews (ORRs) be done before these two storage facilities start up. This is driven by NNSA's designation that these are new facilities. NNSA envisions that the ORRs will be done in June. The TA-18 Early Move Project had planned to be using the pad on June 1st and may be delayed. The mixed oxide fuel is already at LANL in another facility; that facility will be outside its safety basis on June 30th when the shipping container certification expires, unless the shed is authorized and in use.

The late decision to require these ORRs has led to safety concerns for other activities: (1) attention has been diverted and resources have been pulled away from the thorough startup review needed for the higher risk Pu-238 scrap recovery line – this is particularly true for the NNSA RA oversight of the scrap recovery line startup; (2) this action increases programmatic pressure on both TA-18 Early Move and on Pu-238 scrap recovery line startup, creating conditions that are more conducive to human fallibility and potential accident precursors. These were both challenging projects before and are now more challenging if the current schedules are to be maintained.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 3, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 3, 2005

Integrated Safety Management: LANL's integrated work management (IWM) process probably has the greatest potential of any LANL initiative to directly improve day-to-day worker safety, including worker safety in nuclear facilities (site rep weeklies 10/31/03, 1/16/04, 5/7/04, 9/24/04). LANL Audits and Assessments (AA) examined IWM implementation in Nov 2003, Jun 2004, and Mar 2005. Most recently, AA reports seeing some improvements, but there is still a persistent wide range in implementation. Furthermore, 47 of 97 (48 %) of workers interviewed do not believe the process improves safety. LANL management is committed to the IWM approach, but progress has lagged (e.g., guidance and training development). It is worthwhile for LANL to press ahead, particularly on IWM process improvement and training. Any training ought to reiterate the problems that IWM is intended to solve; this might best be done by a discussion of previous accidents (e.g., those cited in previous site rep reports) and how the IWM process, if properly used, might have prevented them.

Training: NNSA has completed its assessment of LANL performance-based training and provided the results to LANL. At this point, LANL's institutional training issues are well-understood, but they permeate the entire laboratory (e.g., IWM implementation). They include: insufficient training staff; weaknesses in management/supervisor training and instructor training; weak job/task analysis, which is key to using a systematic approach to training; ineffective training materials; and no defined process for systematic evaluation of training programs in nuclear facilities. LANL intends to address these issues under the multi-year Operational Efficiency (OE) Project; this will be a massive task.

Plutonium Facility (TA-55): The LANL readiness assessment (RA) for the new Pu-238 scrap recovery line began this week on schedule; the NNSA RA team leader and team remain undefined. NNSA had a uniquely well-qualified team leader selected to review the new line, but he has been reassigned to lead the NNSA operational readiness review for the trailer pad discussed last week.

In December 2004, TA-55 identified that several employees received measurable Pu-238 uptakes last June while working in a Pu-239 lab room (site rep weekly 4/15/05). LANL has thoroughly investigated this event to determine the point of origin, including reviewing 13 months of fixed air sample results (i.e., roughly 62,000 data points). This event appears well understood; appropriate actions have been taken; and the effort has provided a useful investigative tool for future events.

Fire Protection: For most LANL nuclear facilities, fire dominates the high-consequence end of the risk spectrum. NNSA and LANL rely on installed fire protection systems and on LANL and Los Alamos County emergency response personnel to mitigate consequences of a nuclear facility fire.

NNSA has directed LANL to discontinue efforts to establish a long-term contract with Los Alamos County for fire response services. Since 1997, LANL has maintained service via short-term contracts; this has impacted development of a long-term strategy on fire response staffing and resource needs. In mid-2004, LANL completed a Baseline Needs Assessment (BNA) that discussed these needs. Lack of a long-term contract is a likely root cause of many of the BNA issues. It is unclear now how NNSA intends to address these issues, which affect LANL's ability to respond to a nuclear facility fire.

Waste Operations: LANL has made 8 WIPP shipments since mid-April, shipping a total of 134 drums, including 100 from the Quick-to-WIPP set. Characterization activities using conveyors continue (site rep weekly 5/20/05). Prohibited item removal is the rate limiting step at present.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 10, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 10, 2005

The Board and a staff team were here this week reviewing LANL nuclear activities.

Waste Operations: LANL has shifted responsibility for nuclear waste operations to the associate director who is already responsible for critical assembly, plutonium, and tritium operations. This consolidates most of the responsibilities at that management-level for nuclear operations and processes – particularly, from the point of waste generation through the point of waste disposition. On-site transportation, and LANSCE are still in different directorates; these are the exceptions. Potential disadvantages include possibly more challenging span of control and possibly fewer institutional “checks and balances” between the waste generation and disposition points. Potential advantages include increased rigor and operational experience applied to waste operations and possibly more focused planning and support for overall LANL nuclear infrastructure.

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL has developed a corrective action plan in response to its investigation into the March high-airborne contamination event at the RLWTF (site rep weekly 5/6/05); it includes both facility and institutional actions. Key facility elements are: resumption of non-routine radiological work after a management walk-down and approval that adequate controls are in place; a similar management verification for elevated-risk routine work; and establishment of a Facility Operations Safety Committee (FOSC) that will execute a due diligence process for explicitly defining and authorizing work and ensuring adequate controls are in place.

During the next few months, RLWTF faces four major challenges: (1) improving work control based on lessons learned; (2) receiving and treating TA-55 transuranic acid waste in a room with degraded systems – Room 60, as well as treating waste already in the RLWTF acid receipt tank; (3) switching over to new transfer lines from TA-55; and (4) replacing the leaking caustic waste receipt tank and thereby providing TA-55 about a year of operating grace while Room 60 is upgraded. LANL is emphasizing the role of the expert-based FOSC to ensure these activities are conducted safely.

Integrated Safety Management (ISM): Besides the facility-specific actions discussed above, LANL has identified institutional actions in response to the March high-airborne contamination event. These actions are to be completed by September 30th. Some of the key actions include:

- improving the stop work process to accommodate a broader range of situations - the goal is to simplify and incentivize stop work actions as a key element of the ISM program
- performing additional reviews of work practices, including peer-to-peer review for immediate work control improvements and broader recommendations for work control tools and training
- improving integrated work management based on last year’s resumption reviews and other lessons learned – including addressing special work permits and clarifying control hierarchy and importance of conservative hazard assessment and assumptions in work planning
- increasing subject matter expert (SME) involvement in work planning, as well as ensuring appropriate assignment of experienced supervisors, SMEs, and workers to higher-risk jobs
- implementing more consistent radcon practices, and improving compliance with the occupational radiation protection rule (10 CFR 835)

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 17, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 17, 2005

Hadjian was on site for a workshop supporting the LANL seismic hazard analysis update.

Waste Operations: This week, NNSA approved a set of interim compensatory measures for waste characterization operations (site rep weekly, 5/20/05). At issue were characterization activities employing conveyers that place waste drums above their maximum certified drop height. Specific compensatory measures include material-at-risk limits, railings on the sides of the conveyers, and sand bags beneath the conveyers to limit potential drops to less than four feet.

This approval is positive from an overall risk-reduction standpoint, since it will allow shipments of TRU waste to continue to WIPP without delay; these shipments are LANL's principal mechanism for reducing risks associated with the lab's highest consequence nuclear accident postulated in approved safety analyses.

Authorization Basis (AB): While there have been some improvements made in the last year, LANL nuclear facilities are still operating with aging safety bases. For example, the safety bases for the Chemistry and Metallurgy Research Building (CMR), the Plutonium Facility (TA-55), and the Radioactive Liquid Waste Treatment Facility are 6, 8, and 9 years old, respectively. Other factors, besides age, also contribute to uncertainty about the state of safety bases for LANL nuclear facilities, such as: weak document control, extensive use of conditions of approval (COAs) in federal correspondence (ref: Board ltr 1 /31/05), and varying approaches to verifying COA implementation.

The NNSA Site Office with Service Center support has assembled the relevant correspondence between January 2004 and March 2005 in an attempt to verify COA implementation for this period and to develop a useful database. This NNSA team has determined that NNSA issued about 800 COAs during this 15 months. Furthermore, the team is finding that many COAs are not actionable as written and need to be translated into operational terms; this is becoming a sizeable effort that could have been avoided if there was closer coordination between those responsible for safety basis and operations. The NNSA team hopes to achieve verification of these COAs by end of September.

Readiness Verification: Programmatic pressure is beginning to result in some compromises in operational readiness reviews (ORRs) and readiness assessments (RAs). LANL completed the management self-assessment (MSA) last week and the ORR this week for the TA-55 safeguarded trailer pad. The NNSA ORR may start Friday and finish next Tuesday. While this is a low complexity activity, the MSA report indicates that the state of the operation when LANL ORR began was not commensurate with expectations set in the applicable DOE standard (STD-3006). For example, procedures were still draft, operator training was incomplete, disposition of some non-conformances in the pad were open, an AB change needed to be approved, and a fire protection exception remains open. These should not be difficult issues to resolve, but it appears that the verification process is being used more as an assist than an assessment, counter to the intent of the DOE startup order (Order 425.1C). Hopefully, the upcoming ORR on the TA-55-185 shed for mixed oxide fuel containers and the upcoming RAs for the TA-55 Pu-238 scrap recovery line and the TA-18 critical assembly restart will be more deliberate.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 24, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 24, 2005

Keilers is off-site until the week of July 5th.

Authorization Basis: NNSA has approved the laboratory implementing requirements (LIRs) for facility categorization (LIR 300-00-05), nuclear facility safety bases (LIR 300-00-06), and non-nuclear facility safety bases (LIR 300-00-07). These documents clearly outline the expectations for LANL safety analyses and should help improve the quality, consistency, and efficiency of laboratory efforts to establish acceptable safety envelopes for nuclear and other hazardous activities. Approval of these documents is a key milestone in support of safety basis improvements under the Operational Efficiency project.

Quality Assurance (QA): LANL has completed its investigation of impacts associated with potential misapplication of equipment that received only limited qualification from the central calibration laboratory (site rep weekly, 4/29/2005). The investigation concluded that there were no significant impacts to safety or product quality resulting from these application errors. One non-conformance regarding tardy out-of-tolerance notifications from the calibration laboratory was cited as well as several noteworthy practices. A final report is to be issued shortly.

Plutonium Facility: Upon issuance of the contractor operational readiness review (ORR) report, the NNSA ORR commenced for the TA-55 safeguarded trailer pad on Tuesday (site rep weekly, 6/17/05). Key issues from the contractor ORR include: a necessary but still unapproved fire protection exemption, inconsistency between the safety basis and the fire hazards analysis, inadequate start-up plans, and inadequate management understanding of the readiness review process. NNSA intends to complete the ORR and have the pad operational by July 1st; one month later than the original target date. The overall TA-18 relocation schedule has been maintained by re-sequencing material moves, with materials destined for the vaults now preceding materials destined for the trailers.

The contractor ORR for the TA-55-185 shed envisioned to support storage of mixed-oxide (MOX) fuel containers has been postponed until late summer (site rep weekly, 5/27/05). Approval for the current storage location will expire on June 30th with the shipping container's certification. LANL intends to move the containers to the basement of PF-4 by early next week for temporary storage; they will then be moved to TA-55-185 when it becomes available.

Critical Experiments Facility (TA-18): LANL continues to pursue closure of management self assessment (MSA) findings related to resumption of uranium-based critical experiments on the Planet machine. Open MSA pre-start issues include: organizational roles and responsibilities are ill-defined, the safety basis controls have not been clearly established, and operator training is not complete. Commencement of the laboratory readiness assessment is on-hold pending NNSA approval of the plan of action, which is contingent upon further progress on closing MSA issues. Given the resumption delays to date, one of the planned criticality operations for Planet has been cancelled (criticality engineer training) and the other is in jeopardy (NASA space reactor experiment).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 1, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 1, 2005

Radioactive Liquid Waste Treatment Facility (RLWTF): The Interim Safety Basis for caustic tank removal and replacement activities was approved by NNSA this week. It is contingent upon several prerequisite actions being completed; the most significant of which is emptying the collocated acid tank. The equipment necessary to process the acid waste is in less-than-ideal condition and several mitigative options are under evaluation. Execution of any of the options will require Resumption Review Board approval. Currently, LANL believes they can obtain the necessary approvals and complete the caustic tank replacement by early fall.

Plutonium Facility: NNSA has completed their Operational Readiness Review (ORR) for the TA-55 safeguarded trailer pad. The final ORR report is in preparation and will not be issued until next week. Numerous pre-start findings were identified, including: inadequate review of industrial hazards, shortcomings in emergency management, insufficient basis for excluding criticality accident alarms, and an unresolved fire protection exemption. Resolution of these issues will delay start-up of the pad beyond NNSA's July 1 startup goal (site rep weekly, 6/24/05). NNSA HQ has indicated they intend to verify closure of select pre-start issues prior to authorizing operations to commence.

Conduct of Engineering: The NNSA site office completed a safety system oversight review of the systems engineering program at the TA-16 Weapons Engineering Tritium Facility (WETF). The review focused on system engineer training and qualification, configuration management, and surveillance. The team found that although the system engineers were knowledgeable and actively pursuing their qualifications, they should be allowed more time on the floor to monitor their systems. Configuration management processes for programmatic equipment were found to be good, but similar processes for facility equipment were disjoint and confusing. No findings were noted with regard to the surveillance program; however, the team did observe that the facility was slow to respond to previously identified in-service inspection issues.

Authorization Bases: This week, NNSA approved LANL's latest revision to their nuclear facilities list (Rev. 6). This list is intended to capture all hazard category 2 and 3 facilities at the laboratory and identifies their numbers as 18 and 10, respectively. These numbers include the relatively static environmental remediation sites.

Chemistry and Metallurgy Research Facility (CMR): In light of uncertainty regarding the number and implications of suspect welds in facility safety and support systems, NNSA has mandated that LANL reduce the allowable material-at-risk (MAR) in CMR from 20.2 kgs of plutonium equivalent to 9 kgs. This reduction significantly lowers the potential unmitigated accident consequences postulated in the facility safety basis; but not below the evaluation guideline of 25 rem. Although the suspect welds call into question the reliability of the credited safety features (fire suppression and ventilation), NNSA has decided to accept the residual risk of continued facility operations subject to near-term implementation (by July 12th) of the new MAR limits.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 8, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 8, 2005

Plutonium Facility (TA-55): The NNSA Site Office believes that preparation of the new safeguarded trailer pad needs to be further along and that another readiness review cycle is needed before startup; this appears appropriate. While the NNSA operational readiness review (ORR) discussed last week was thorough, the facility was clearly not ready, and the nature and number of pre-start findings for what ought to be a straight-forward activity are a major concern.

For example, the NNSA team observed that program drivers and schedule pressure completely dominated safety oversight; NNSA operational oversight was particularly not evident; criticality safety issues exist, such as lack of justification for not having criticality alarms; emergency response personnel left a mock injured person unattended in a mock contamination area for 25 minutes while responding to a simulated spill; and construction and installation of additional trailers was incomplete at the time of the ORR and represents an unanalyzed hazard outside the safety envelope. By any standard, these findings constitute an unacceptable condition for starting operations and possible indicators of other undiscovered significant issues. NNSA and LANL appear to have rushed to declare readiness and push through the verification process. It's clear that the readiness verification process was used as an assist in getting ready, which is counter to applicable DOE requirements. There were indicators of this evolving condition (site rep weekly 6/17/05).

Readiness Assessments (RA): The TA-55 pad ORR is not the only recent case where programmatic pressure has been allowed to compromise the effectiveness of the readiness verification process. The recent LANL RA on the new TA-55 Pu-238 scrap recovery line also identified a large number of findings and observations (i.e., 72, including 29 pre-starts); this is unexpected from an operation that has had previous RAs and has been preparing for startup for years. For both the pad and the new line, management prematurely declared readiness to proceed. This trend ought to be reversed.

Integrated Safety Management (ISM): There continue to be indicators that the LANL Integrated Work Management (IWM) initiative may need tuning and is neither fully nor consistently implemented (site rep weekly 6/3/05). Also, in April, NNSA completed a verification that pre-start findings from the LANL resumption reviews were either closed or have adequate compensatory measures in place (site rep weekly 4/29/05). The largest category of the roughly 400 pre-starts involve ISM (32 %). The site reps observe: (1) it's vital that LANL follow up on the transition of compensatory measures to final closure – based on discussions, LANL management understands this; (2) LANL did not present nor did NNSA review closure of the ISM-related pre-starts against consistent criteria. As a result, the state of IWM implementation may have been accepted for some organizations when a similar state was rejected for others, resulting in a misleading impression of the state and consistency of implementation.

The site reps believe that LANL could tighten up feedback and thereby ensure continuous improvement, as well as full and consistent implementation of the IWM process; this might include increasing senior management involvement, further empowering the Integrated Work Management Committee (IWMC), and increasing the frequency of floor-level assessments of implementation – both locally and by the institution – to ensure performance matches institutional expectations.

Chemistry and Metallurgy Research Building (CMR): In May, the site reps reported on a contamination event involving four workers in CMR (site rep weekly 5/20/05). Bioassay results indicate that the exposures were less than 1 % of the federal annual limit for rad workers (5 Rem).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 15, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 15, 2005

Plutonium Facility (TA-55): In April, NNSA rejected the Interim Technical Safety Requirements (ITSRs) submitted by LANL for TA-55. The intent of the ITSRs is to consolidate the best available control set for TA-55 operations pending completion of the final Documented Safety Analysis upgrade (site rep weekly, 4/22/05). NNSA and LANL also indicated that the ITSRs would capture the safety-class control strategy for addressing passive confinement vulnerabilities identified last December. The Board has clearly stated its position (re: Board letter 5/31/05) that a reasonable upgrade of the existing active confinement ventilation system is the preferred safety-class alternative.

LANL has revised the ITSRs to address previous NNSA comments and resubmitted them for approval. In general, the latest ITSRs represent an improved set of controls, derived from the most recent analyses, and captured in a single document; this is a positive. However, the ITSRs eschew the active confinement ventilation system as a safety-class control and continue to rely on a collection of administrative controls and process specific design features to compensate for the passive confinement vulnerability; this is disappointing. The recently completed LANL cost-benefit analysis for potential TA-55 ventilation system upgrades (site rep weekly, 4/15/05) concludes that a full upgrade of the ventilation system is impractical (i.e. \$352 M), and that improvements to either the passive confinement system or select glovebox and fire suppression equipment are preferable, as a long-term solution, to more focused ventilation system upgrades.

The NNSA position regarding the proposed safety-class control strategy and potential upgrades to the active confinement ventilation system remains undeclared pending completion of their on-going review of the ITSRs. NNSA is expected to finish their review before the end of the month.

Unreviewed Safety Questions (USQs): LANL has completed its review of all negative Unreviewed Safety Question (USQ) determinations dating back to April 2001 (3/18/05). The review was performed in response to NNSA concerns about potentially inadequate implementation of the USQ process at the lab. Of the 1,263 negative USQ determinations reviewed, 20 (~1.6%) were found to be mis-characterized that should have been positive. Statistically, the results do not indicate a systemic failure of the USQ process at LANL; however, the specific safety implications of the 20 incorrect determinations are still under review. As an on-going quality control measure, LANL's central safety basis office will continue to review, on a sampling basis, negative USQ determinations from May 2005 forward.

Waste Operations: LANL's transuranic (TRU) waste shipments to WIPP are the principal means for LANL to reduce risks associated with the lab's highest consequence nuclear accident postulated in approved safety analyses (site rep weekly 4/15/05). Unfortunately, several safety basis and operational issues have arisen that call into question the safety envelope supporting waste operations. It is imperative that NNSA and LANL expeditiously correct these deficiencies to ensure the proper controls are being implemented to support safe and efficient execution of these critical risk-reduction activities

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 22, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 22, 2005

Jordan and Shackelford were on-site this week to review training and qualification programs at both LANL and LASO. Keilers was off-site Wednesday and Thursday to attend the NNSA workshop on activity-level work planning and control with Burnfield.

Critical Experiments Facility (TA-18): LANL has revised their path forward for resuming uranium-based critical experiments on the Planet machine in response to shifting NNSA priorities and lessons-learned from the recent readiness verification failure for the TA-55 safeguarded trailer pad. Resolution of outstanding safety-basis issues (e.g. impacts of local control station removal, uncertain structural capacity of Planet's upper fissile material holding plate, and approval of new material-at-risk limits) will now be obtained prior to recommencing any readiness verification reviews. Once these issues are closed, LANL intends to perform a second management self-assessment and an independent lab readiness assessment to verify readiness. LANL intends to perform sub-critical prerequisite activities (e.g. hand-stacking measurements) to minimize the time needed to complete the planned uranium-based experiments. These prerequisite activities are scheduled to begin next week.

Radioactive Liquid Waste Treatment Facility (RLWTF): NNSA and LANL recently convened an independent technical review of the RLWTF replacement project. The review team's report identified several potential improvements, including robust segmentation of certain facility operations to isolate potentially higher source-term materials from lower source term materials. Specifically, the review team suggested that higher source term materials be removed using simple settling and filtration techniques in a robust below-grade cell upstream of the main purification facility and that only lower source-term supernate be forwarded on for more complex processing in the purification facility. This recommendation appears sensible from both a safety and economic perspective; the higher hazard materials would be localized in a simple and robust enclosure with minimal manipulation and the more complex purification facility would only be required to process lower hazard materials. Further exploration of this approach appears warranted.

Readiness Assessments (RA): In response to the failed readiness verification process for the TA-55 safeguarded trailer pads (site rep weekly, 7/8/2005) and the NNSA operational readiness review finding that adequate LASO safety oversight was not evident, the LASO Manager convened an independent review by personnel from the NNSA Albuquerque Service Center. This review found the following issues at LASO contributed to failed process: approval of the level of readiness review required was not coordinated between the assistant managers for safety and operations, and no formal site office procedures are in place to ensure future coordination; integration of safety, security, and program imperatives occurred below the site office manager level and was not well balanced; and inadequate resources were provided to support a successful readiness process in the time allotted by the aggressive schedule. These findings appear to be specific manifestations of more general problems associated with informal site office processes, poor coordination between assistant managers, integration of competing imperatives at too low a level in the organization, and inadequate resources. Timely resolution of these problems is necessary to ensure that LASO is capable of providing effective safety oversight.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 29, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: T. D. Burns Jr. and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 29, 2005

Am-241 Contamination Event: On Monday, LANL determined that a staff member in the Sigma Complex (TA-3-66 – a radiological facility) had become contaminated with Am-241 eleven days earlier while unpacking vials of uranium nitride from TA-55. During the period that contamination was undetected, the employee unknowingly spread contamination both in the facility and off-site, including his home. LANL is pursuing surveying and decontamination activities both on and off-site, including surveying the nearly two hundred people who work in Sigma and their work-spaces. As of Thursday, about a dozen people were placed on special bioassay monitoring; initial bioassay results should be available in mid-August. LANL has secured affected areas and is initiating an investigation.

Critical Experiments Facility (TA-18): Also on Monday, LANL determined that the fissile content of four recently re-packed 110 gal drums had not been reviewed by the criticality safety group and that these drums exceeded the criticality limit by factors of up to 2.25. This was discovered during a criticality review to support shipping the drums. Local posting refers to guidance given elsewhere for the type of material involved. There are similarities between this event and problems observed during simulated fissile material handling for the TA-55 pad ORR (site rep weekly 7/8/05); together, they indicate issues with procedure clarity, training, supervision, and oversight of fissile material handling.

Federal Oversight: Ineffective assessment processes – both federal and contractor – contributed to the decision last summer to suspend LANL operations (site rep weekly 12/31/04). The resumption reviews provided breadth-and-depth perspective on the state of operations; however, the quality of that picture will decay with time without a mature contractor assessment system. To compensate for this, NNSA had planned to increase federal staffing at LASO by 20 % in FY-06, including increased field presence by facility reps and subject matter experts. Those plans have been cancelled. LASO now plans to rely highly on a mature contractor assurance system that currently does not exist at LANL and that will take some time to develop regardless of the outcome of the contract competition. The federal approach to oversight of LANL now appears counter to the reality that challenges are growing; LANL is a unique national institution in transition, particularly from the standpoints of mission, safety, security, infrastructure, business practices, and the unprecedented contract change.

Radiological Facilities: Since 1997, NNSA has approved downgrading more than a dozen nuclear facilities to radiological facility status, including at least two facilities where NNSA credited ANSI source encapsulation as permitted by the applicable DOE standard (STD-1027). From review of the available information for these two facilities (TA-35-2, TA-35-27), it is not clear that these sources would maintain their integrity at end of life in a major facility fire, which could result in unanalyzed on-site and off-site consequences. If these were designated as nuclear facilities, LANL would be required to develop and implement engineered and administrative controls to address such scenarios; this same rigor appears warranted for these radiological facilities. Furthermore, the level of oversight by both LANL and LASO drops precipitously for facilities that are categorized as radiological. Increased attention to radiological facilities lab-wide appears warranted to ensure that residual risks are identified and are addressed appropriately (site rep weeklies 1 /21/05, 9/24/04).

Administrative: This is the last weekly report for Burns, who is leaving the federal service and relocating to the Washington D.C. area. It has been an honor to work for the Board and a privilege to serve at LANL.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 5, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 5, 2005

Am-241 Contamination Event: In response to the inadvertent contamination release reported last week, LANL has addressed off-site contamination and has implemented adequate radiological controls in the Sigma Complex (TA-3-66). Contamination spread occurred via contact and not airborne suspension; with each contact, the levels transmitted dropped one-to-two orders of magnitude. Contamination beyond secondary-contact is very low and likely non-detectable by standard techniques.

Within Sigma, LANL is controlling access to contaminated areas, which include two offices, a lab room, and a shop. LANL has put in place continuous air monitoring in selected areas, monitoring of personnel upon building exit, and daily surveys of high-traffic areas, all of which indicate the controls are effective. Whole body counts on the primary individual involved indicate a low-level uptake; more definitive bioassay results should be available in a few weeks. LANL is investigating the event.

Waste Operations: LANL's transuranic waste shipments to WIPP are the principal means for LANL to reduce risks associated with the lab's highest consequence nuclear accident postulated in approved safety analyses (site rep weekly 7/15/05). Since April when shipments resumed, LANL has made 17 shipments for a total of 347 drums – of which around 200 (60 %) are from the higher-activity Quick-to-WIPP set – and the shipment rate has doubled from about 1 per 8 days to 1 per 4 days on average.

This has happened in spite of operational issues, such as poor safety basis implementation and inconsistent disciplined operations. For example, the Area G safety basis was suppose to be implemented in Summer 2004; Area G prematurely terminated a verification assessment on safety basis implementation in January 2005, and it has never been completed. There are also indicators of issues in the LANL resumption review report for waste operations, dated 1/10/05 (site rep weekly 1/21/05). In light of LANL reports of new evidence of problems, the LASO Manager has requested the LANL Director to justify continued operation of the TA-50/54 waste facilities by next Thursday (8/11/05).

Plutonium Facility (TA-55): Last Thursday (7/28/05), NNSA approved a set of interim technical safety requirements (ITSRs) for TA-55 that expire in one year. The ITSRs are intended to consolidate controls from: unreviewed safety questions against the currently approved 1996 safety basis, hazard analyses from the proposed 2002 safety basis upgrade, and compensatory measures approved in February to address the passive ventilation confinement vulnerability (site rep weekly 7/15/05). Key controls are to be implemented and verified within 90 days, with the remainder within 11 months. NNSA and LANL expect few TSR changes will be required when the full safety basis upgrade is finished in about a year.

LASO is reviewing the cost-benefit analysis for ventilation upgrades and remains skeptical of the cost effectiveness of the currently understood full upgrade to safety-class. LASO questions whether the system, as-is, even meets safety-significant requirements and has directed LANL this month to recommend prioritized low-cost upgrades that will improve ventilation reliability and reasonably reduce risk. LASO also tasked LANL to propose improvements to fire suppression and to high-risk glove-boxes within the next few months and to replace Pu-238 glove-box HEPA filters within the next year.

Authorization Basis: LANL is no longer pursuing the use of the TA-55-185 shed to store mixed-oxide fuel shipping containers and the temporary use of the TA-54 Decontamination and Volume Reduction System (DVRS) to repackage transuranic waste drums (site rep reports 6/24/05, 5/27/05, 6/11/04).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 12, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 12, 2005

DOE Independent Oversight Review: This week, the DOE Office of Independent Oversight and Performance Assurance (DOE-OA) had a team on site preparing for an in-depth review in October; based on anticipated scope, this review should provide a good indicator of the status of corrective actions that were developed in response to last year's resumption reviews.

NNSA Type B Accident Investigations: Next week, NNSA will start two Type B investigations per DOE Order 225.1A into (a) the loss of contamination control in TA-3-66 (Sigma) involving TA-55 items, and (b) the acid inhalation injuries in TA-48 RC-1, discussed below. LANL investigative efforts will shift to assisting the federal teams. Both Type B investigations are to be done by Sep 30th.

Radiochemistry Laboratory (TA-48 RC-1): On June 16th, two RC-1 post-docs received potential chemical overexposures when mixing acids without appropriate ventilation. Both exhibited immediate symptoms. One recovered shortly while the other had continuing symptoms and was hospitalized for six days in late July. The LANL Medical Director and LANL management were informed of the event on August 3rd, nearly seven weeks after the event, and LANL reported it to NNSA. Both RC-1 and the LANL division that runs RC-1 have a history of operational issues, often involving students or post-docs (e.g. site rep weeklies 1/28/05, 9/17/04, 8/1/03, 1/10/03, 6/28/02). The LANL Director has reemphasized to the work force that employees have the right and responsibility to stop work for unsafe conditions. This event is the subject of one of the Type B investigations.

Integrated Safety Management (ISM): Both the TA-55/Sigma and RC-1 events illustrate that LANL has not fully and consistently implemented the Integrated Work Management initiative. As discussed in the Board's letter of July 21st, this initiative has the greatest potential of those within the Operational Efficiency Project to directly improve worker safety. The RC-1 event particularly indicates issues with stopping work when presented with unsafe conditions, prompt reporting of problems, and focusing on learning from events. Overcoming such issues is key to LANL evolving to a high-reliability organization as described in DNFSB TECH-35, Dec 2004.

Until LANL achieves that state, NNSA and LANL have to rely on assessments and oversight to detect and correct problems. The majority of NNSA and LANL institutional oversight now focuses on nuclear and high-hazard facilities and their implementation of NNSA approved safety bases, which is important; line management at the group, division, and associate-director levels is held responsible for oversight of low-to-moderate hazard facilities, like Sigma and RC-1, and that oversight is inconsistent in effectiveness at best. Within the latter class of facilities, the site rep observes that oversight drops precipitously for facilities that are downgraded from Hazard Category 2 or 3 to radiological status (site rep weekly 7/29/05). Sigma was downgraded in March 2001. RC-1 was downgraded in June 2003.

Decommissioned Facilities: This week, the site rep toured part of the TA-21 plutonium facility, which has been in surveillance and maintenance status since the early 1980's. With the exception of a few lab benches, the rooms are empty. Essential services are maintained, including fire suppression, and combustible content is low. Residual contamination is fixed under the floor cement covering and under wall and ceiling paint; there is extensive paint peeling in some areas. Water intrusion is evident both from spots in the ceiling and around many concrete support columns; the water intrusion is extensive enough that it could be an indicator of incipient structural issues. LANL has prepared budget estimates and, subject to funding approval, intends to begin removing the TA-21 plutonium and tritium facility structures starting in FY-07.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 19, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending August 19, 2005

Weapons Engineering Tritium Facility (WETF): On Wednesday (8/17), WETF suspended programmatic operations due to emergent questions on (a) whether WETF was operating under an NNSA approved set of technical safety requirements (TSRs) and (b) whether WETF had correctly used the LANL unreviewed safety question (USQ) process to determine if facility modifications required NNSA approval. The former question has been resolved; the latter remains under review.

Waste Operations: LANL has responded to NNSA's request to justify continued operation of the TA-50/54 waste facilities (site rep weekly 8/5/05). Overall, LANL has increased emphasis on conduct of operations and on management walk-downs and reviews as a start for long-term improvements.

Actions taken so far appear appropriate. Among these, LANL: (a) assessed key areas such as life safety, pressure safety, fire suppression, drum integrity; (b) secured some activities due to deficiencies found in assessments; (c) continued other activities with compensatory measures such as time and temperature restrictions for workers in personnel protective equipment, air quality verification before work in normally unmanned spaces, increased communication on status of activities, and increased support by external operations experts; and (d) established an expert-based Facility Operations Safety Committee (FOSC) that reviews work planning and controls for liquid waste operations. LANL plans to expand the FOSC reviews to cover all waste operations. LANL also has assessments underway to determine extent of condition for safety basis implementation issues involving waste operations.

Plutonium Facility (TA-55): While TA-18 Early Move activities are proceeding, the related path-forward for the TA-55 safeguarded trailer pad still appears open (site rep weekly 7/8/05). On August 9th, the LASO Manager proposed to NNSA Headquarters (NA-10) a path forward for readiness review and startup. The proposal does not require redoing the readiness assessment process (i.e., ORRs) but instead focuses on thorough federal and contractor followup on the known issues. While commitment to rigorous closure has been expressed, many details are missing. NA-10 action is forthcoming.

Critical Experiments Facility (TA-18): The path-forward is still open for the remaining Planet and Comet experiments, including defining the readiness assessment needs and considering whether to perform the experiments later in Nevada instead (site rep weekly 7/22/05). On August 15th, LANL proposed to NA-10 retaining required parts at TA-55 and performing the experiments in TA-18. It has been longer than a year since critical assembly operations. The Comet and Planet experiments are expected to take 10 to 20 days and 18 to 36 days, respectively. A detailed baseline is due by Sep 30th.

Chemistry and Metallurgy Research Building (CMR): In late 2003, LANL determined that some welding processes used on site may not have complied with national consensus codes, and in April 2004, LANL began a program to ensure appropriate quality in new welds and to screen accessible existing welds in nuclear facility safety systems (site rep weeklies 3/26/04, 4/26/04). As part of that screening, CMR identified 1,221 suspect welds – the most by far in any LANL nuclear facility. Since May 2005, LANL has had a team of system engineers and welding experts (including certified weld inspectors) inspect and evaluate for service the suspect welds and select other welds in CMR; results, including photographs, are documented in an extensive database. Out of about 2,000 welds evaluated, CMR found 28 unacceptable welds and one missing beam clamp. CMR has issued non-conformance reports on these deficiencies to begin disposition.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 26, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending August 26, 2005

Waste Operations: Last Friday (8/19), the TA-50 Waste Characterization, Reduction, and Repackaging Facility (WCRRF) suspended its glovebox operation due to an employee concern that an air-operated tool in use could pressurize the glovebox and cause a release to the room; LANL has also found that the vacuum on this box is marginal, even with the air tool disconnected, and is working toward resolution. WCRRF repackages transuranic waste drums to support the Quick-to-WIPP program, which is key to LANL long-term risk reduction (site rep weekly 8/5/05); it's in heavy use because of the high fraction of legacy drums found with prohibited items during real-time radiography. The suspension illustrates a key challenge for NNSA contractors, which is to appropriately address the entire risk spectrum of potential upsets from low to high consequence.

Weapons Engineering Tritium Facility (WETF): Last Wednesday (8/17), LANL line management suspended WETF programmatic operations, as reported last week. On Thursday (8/25), LANL line management documented the concerns and their resolution and authorized resumption. Lack of annual safety basis updates and a major change in the LANL unreviewed safety question (USQ) process last September contributed to confusion (site rep weekly 3/18/05); the technical safety requirements (TSRs) and the safety basis for WETF are 2 and 3 years old, respectively. Also contributing is the fact that many USQs involve modifications and only address the end-state but not the interim states that may actually be higher risk; this is an institutional issue. LANL is performing a back-look on WETF USQs.

Lessons learned from this event include the need for clear formal communication when suspending and resuming nuclear operations, particularly what management-level suspended operations, what specifically were the problems causing suspension, what will be the criteria for resumption, and what level of readiness review will be required to verify that the originating problems were corrected.

Plutonium Facility (TA-55): On Thursday, TA-55 had a criticality safety limit violation involving a 2 % exceedance of fissile material passing through a glovebox; the problem was found and reported by those involved, which is positive. Line management has suspended TA-55 and TA-18 special nuclear material movements and is implementing a corrective action plan with clear resumption criteria.

NNSA Oversight: Safety oversight by the NNSA Site Office (LASO) is increasingly hampered by several factors, including an imbalance of experience and authority within LASO management and the lack of a formal concurrence process that would provide LASO management a balanced perspective and unity-of-purpose before decisions are made. These are longstanding issues (e.g., site rep weeklies 3/29/02, 8/23/02), but their safety significance is increasing at this time of transition. Recent symptoms include the premature declaration of readiness for the TA-55 pad ORR and the two ORR pre-start findings on federal oversight (site rep weekly 7/8/05); these findings indicated a lack of a demonstrable oversight program for the pad and a lack of active counterbalance between program and operations or other safety personnel. Events since then indicate the problems persist, resulting in a loss of focus.

Another limiting factor is inadequate field presence; for example, the number of deployed, qualified facility reps (7) has dropped by about a third in the last year and is now about a third of that projected to be required in the most recent LASO facility rep staffing analysis (20 - see site rep weekly 1/7/05). Experienced federal management, adequate experienced staff, focused attention, and balanced perspective all appear to be key through contract transition, and they all warrant attention.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 2, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 2, 2005

Fire Protection: LANL has submitted to the NNSA Site Office a strategy to address fire protection deficiencies and achieve site-wide improvements, as requested by a Board letter dtd 5/31/05. It includes proposals for increasing staffing, addressing the Baseline Needs Assessment, and completing site-wide fire alarm system replacement via a budget line item. LANL requested comments by Sep 9.

Plutonium Facility (TA-55): LANL has recommended to NNSA the following prioritized upgrades to improve ventilation reliability and reduce risk (site rep weekly 8/5/05): complete installation of a new diesel generator; design and install switchgear upgrades and a new uninterruptible power supply; replace confinement doors and certain aging components in the facility control system; and reinforce internal ventilation ductwork to meet current seismic requirements. Portions of these upgrades are included in the TA-55 Reinvestment Project. LANL is also finalizing a re-analysis of accidents that rely on building confinement ventilation as the primary control. Results are expected shortly.

NNSA HQ (NA-10) is the startup authority for the TA-55 safeguarded trailer pad and has approved a path-forward for startup (site rep weeklies 7/8/05, 8/19/05). Key elements include NNSA Site Office (LASO) verification of readiness to start, and NA-10 and NNSA Chief of Defense Nuclear Safety (CDNS) review of issue closure packages. NA-10 is also requiring NA-10 & CDNS review and NA-10 approval of LASO corrective actions and plans for addressing federal oversight deficiencies.

Waste Operations: Transuranic waste repackaging in the TA-50 Waste Characterization, Reduction, and Repackaging Facility (WCRRF) remains suspended due to glovebox concerns; timely resolution is needed to support LANL risk reduction (site rep weekly 8/5/05). This has evolved into a safety basis issue since (a) the potential to pressurize the glovebox is an unanalyzed accident; (b) isolating air supply to prevent the accident constitutes a modification and a new control; and (c) glovebox vacuum is marginal in the event of a breach. WCRRF's safety basis is poor; it consists of a 5-year-old hazard analysis and interim technical safety requirements. NNSA has also directed that WCRRF shut down within 1 or 2 years; therefore, extensive facility or safety basis upgrades may not be worthwhile.

Los Alamos Neutron Science Center (LANSCE): Portions of LANSCE are designated as hazard category 3 (HC-3) nuclear facilities, and LANSCE operates under a multi-part safety basis that is more than 4 years old and intended to comply with both nuclear facility and accelerator safety requirements (site rep weekly 1/9/04). NNSA recently disapproved a LANL recommendation to consolidate the safety basis and operate LANSCE solely to the accelerator safety requirements in the applicable DOE Order (DOE O 420.2B). NNSA asserts that this order's exclusion of accelerators from the Nuclear Safety Management Rule (10 CFR 830) is inappropriate for LANSCE since LANSCE's radioactive inventory exceeds the HC-3 threshold and may even exceed the HC-2 threshold. The path-forward for LANSCE to achieve an updated set of necessary and sufficient safety basis controls is uncertain.

TA-21 Tritium Facility: NNSA has approved downgrading the TA-21 Tritium Science and Fabrication Facility (TSFF) from Hazard Category 3 to radiological. Neutron Tube Target Loading continues pending transfer of that mission to Sandia, after which TSFF will begin decommissioning.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 16, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 16, 2005

Waste Characterization, Reduction, and Repackaging Facility (WCRRF): NNSA has approved interim safety basis requirements (e.g., worker respiratory protection, increased airborne monitoring) for resuming repackaging of transuranic waste in WCRRF (site rep weekly 9/2/05); this resumption is essential to achieve the Quick-to-WIPP Program risk reductions. The NNSA Site Office has declared it is the restart authority and will approve restart based on a LANL management self-assessment.

Plutonium Facility: In addition to ventilation upgrades previously discussed (site rep weekly 9/2/05), LANL plans on refining accident analyses by January with the goal of showing a passive confinement strategy works; modeling refinements include ramp vs step airborne release, explicit material-at-risk partition for Pu-238 powder vs sintered-form, refined wind boundary conditions from a computational fluid dynamics code. If this fails, LANL plans to quantify potential passive confinement upgrades in February, and if those prove insufficient, consider the following options in this order in March: an active aerosol removal system at PF-4 exits; fire suppression upgrades; further ventilation upgrades. It is unclear how this aligns with DOE's implementation plan for Board Recommendation 04-2.

Pu-238 Operations: On Thursday, LANL, NNSA, and the staff had a video-teleconference on the status of aqueous recovery startup and corrective actions from the August 2003 contamination event. LANL is making progress in dispositioning some legacy Pu-238 residues as waste, but resumption of pyrolysis is now projected to slip into next year. Pyrolysis warrants priority since it is an essential risk reduction step for the large remaining inventory of combustible residues (site rep weekly 4/22/05).

Emergency Response: LANL is radically changing its Emergency Operations Center (EOC) processes and procedures to implement the National Incident Management System (NIMS) per Presidential Directive HSPD-5. While there is much to be done, progress is evident in recent training activities and drills compared to the exercise last December (site rep weeklies 5/20/05, 12/3/04).

Conduct of Engineering: Under the Operational Efficiency (OE) Project, LANL has established an institutional engineering program, including setting up an active Engineering Practice Council, formally training and qualifying ~25 systems engineers (including oral boards), and developing an institutional manual and procedures that are now under senior management review. In FY-06, LANL plans to begin improving engineering records for vital safety systems using the new procedures.

Quality Assurance (QA): Under the OE Project, LANL is on-track by December to issue 9 of 15 key institutional QA procedures and to close the site-wide welding potential inadequacy in safety analysis (PISA). The 9 procedures involve audits, assessment, commercial grade dedication, suspect counterfeit items, graded approach, non-conformance reporting, supplier evaluation, and procurement quality. LANL believes that the 6 remaining procedures would benefit from input from the new contractor; these include calibration, inspection and test, document control, and records management.

Safety Basis: The safety basis sub-project is one of the more deeply challenged efforts under OE to achieve its goals, including ensuring sufficient qualified staffing, and establishing and verifying safety basis document control. LANL now plans to complete its OE safety basis commitments and to independently assess technical safety requirement implementation in nuclear facilities by May 31st.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 23, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 23, 2005

Von Holle was on site this week attending the LANL energetic materials review.

Plutonium Facility (TA-55): The NNSA Site Office (LASO) has endorsed the LANL plan to refine accident analyses and try to justify a passive confinement strategy by January 2006 (site rep weekly 9/16/05); NNSA emphasized LANL continuing plans to reduce material-at-risk limits, to seismically upgrade the 60 % of glove-box supports that have not already been upgraded to safety-class, and to provide safety-class containers capable of withstanding fire, explosion, puncture, and crushing. The challenges, besides the analyses, are significant; for example, the widely used TA-55 standard container (i.e., the Hagan can) has elastomer seals that will likely fail and leak during a major fire.

Waste Operations: LANL's transuranic waste shipments to WIPP are the principal means for LANL to reduce risks associated with the lab's highest consequence nuclear accident postulated in approved safety analyses. Since April when shipments resumed, LANL has made 36 shipments for a total of about 800 drums – of which 362 (45%) are from the higher-activity Quick-to-WIPP set. LANL has also increased emphasis on conduct of operations and on management walk-downs and reviews as a start for long-term improvements (site rep weekly 8/19/05).

Last Wednesday (9/14/05), LANL provided LASO a roughly 2-year \$20M integrated plan to move nuclear waste operations from its current ad-hoc mode to an efficient, unified, disciplined operation. Key elements include improving organizational management and worker culture and training by December, improving infrastructure and safety basis implementation by September 2006, and revitalizing operations by early 2007. This Wednesday (9/21/05), LASO provided LANL its recent "for-cause" assessment of safety systems supporting waste operations. It concludes that safety basis requirements generally are inadequately identified, implemented, and fulfilled; specific findings are sweeping and involve safety bases, USQ process, requirement flow-down, fire protection, configuration management, and safety system surveillance, testing, and maintenance.

Many of the issues from the LASO assessment were previously recognized (e.g., site rep weekly 8/5/05) and could be addressed within the LANL plan. One course would be for LANL to evolve the plan based on review of specific LASO findings, establish clear metrics and milestones, and, with full LASO support, expeditiously execute the plan and reduce risk in a timely and balanced manner.

NNSA Oversight: LASO has nearly completed its verification of the TA-55 safeguarded trailer pad startup readiness (site rep weekly 9/2/05); the verification process so far has been ad-hoc but thorough. However, last Friday (9/16), LASO proposed to NNSA headquarters (NA-10) a pad fire protection exemption without obtaining concurrence from LASO staff responsible for safety basis and for fire protection. The exemption request is on hold; LANL is working with LASO to resolve remaining technical issues, which involve new hazards and controls not recognized when the exemption request was generated. LASO's weak concurrence process is a recurring issue (site rep weekly 8/26/05). Furthermore, 5 of 10 LASO technical managers have not completed the Senior Technical Safety Manager (STSM) qualification, nor are compensatory measures apparent (ref: DOE response to Board Recommendation 93-3, *Improving DOE Technical Capability*). This aspect, coupled with the last year's turnover of LASO technical managers, may be further weakening local federal oversight.

Sigma Complex (TA-3-66): On Monday (9/19/05), Sigma reimplemented personnel exit surveys and other controls, based on Am-241 contamination found in uncontrolled areas (site rep weekly 8/5/05).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 30, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending September 30, 2005

The site representative was at DNFSB-Headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 7, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 7, 2005

Plutonium Facility (TA-55): On Wednesday (10/5), the NNSA Site Office (LASO) submitted issue closure packages to NNSA Headquarters (NA-10) and recommended startup of one trailer on the safeguarded trailer pad. This follows LASO and LANL resolution of open trailer fire protection issues early last week and NA-10 approval of the trailer fire protection exemption last Wednesday (9/28).

Last Friday (9/30), LASO approved startup of TA-55 enhanced external security measures before completion of formal verification that safety basis controls for these measures were in place; startup was nearly immediate to support secretarial-level security commitments made in 2003. The LANL management self-assessment (MSA) started in earnest this Monday (10/3) and was completed Thursday (10/6). The LANL readiness assessment (RA) is expected to start and finish next week.

Startup before verification creates a vulnerability that in this case was avoidable: the MSA previously began on Sep 12th with ample time, but then aborted two days later while LASO reconsidered the level of readiness review – resolved on Sep 28th. During this period, LANL recognized a new major accident scenario, complicating matters, and appropriately proposed TSR modifications on Sep 27th. LASO approved these on Sep 29th. When LASO approved startup on Sep 30th, LASO also restricted LANL from implementing some of the enhanced security measures, apparently due to lingering safety concerns. At present, the controls look adequate for the current security measures, but the expedited process used was less than satisfactory and increases the probability that something was missed.

Critical Experiments Facility (TA-18): LANL has completed characterization and packaging of material requiring Security Category I/II; there are few of these items remaining to be shipped, and they will be shipped once NA-10 authorizes startup of the TA-55 safeguarded trailer pad.

LANL has stopped work on Comet and is shifting attention to preparing SHEBA to resume delayed-critical operation and to start burst-mode operation; LANL's ability to successfully conduct these operations at TA-18 is subject to appropriate planning, priority, and support. Looking ahead, the future for DOE criticality training and experimental capability is the proposed Critical Experiments Facility (CEF) at the Nevada Test Site. The Energy Systems Acquisition Advisory Board (ESAAB) met this week to consider Critical Decision-2 for the CEF Project; the outcome is unknown.

Sigma Complex (TA-3-66): On Monday (10/3), a Sigma employee driven by program requirements singlehandedly removed a heavy press from a hood, surveyed it with a meter, and found it lightly contaminated with depleted uranium. He then attempted decon, tagged the press as radioactive, and moved it into a corridor where a radcon tech found it on Wednesday. LANL is investigating. Sigma is one of a class of facilities that receives little federal and contractor oversight; such oversight might detect vulnerabilities without relying on events such as this to flag issues (site rep weekly 8/12/05). This particular event would likely have received little attention except for increased contractor sensitivity due to the Am-241 Type B investigation underway. It warrants study since it reveals multiple work-control issues, some of which appear traceable to latent organizational weaknesses.

Chemistry and Metallurgy Research Building (CMR): CMR is inventorying and removing legacy hazardous chemicals and, this week, found three containers of shock-sensitive material. LANL Hazmat responded, and the containers are being deliberately and safely dispositioned.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 14, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 14, 2005

Jordan was on site this week augmenting site rep coverage.

DOE Independent Oversight: The DOE Office of Independent Oversight and Performance Assessment (DOE-OA) is here this week and next inspecting NNSA & LANL management programs for environment, health, and safety; a major focus of their inspection is status of corrective actions developed in response to last year's resumption reviews. They return in mid-Nov to validate findings.

Waste Operations: Based on a LANL management self-assessment, NNSA has approved restart of examining and repackaging of transuranic waste in the TA-50 WCRR Facility; this is an essential step for LANL to move forward on the Quick-to-WIPP risk reductions (site rep weekly 9/16/05).

Plutonium-238 Operations: By Oct 31st, LANL expects to complete decontamination of the room that was contaminated in August 2003. Currently, four cans in the room await packaging; the remainder (~234) have been packaged for eventual shipment to WIPP via Area G or for eventual stabilization (e.g., pyrolysis) and disposition (e.g., aqueous recovery) within TA-55.

DOE-NE (Nuclear Energy) and LANL currently expect LANL to resume bench-scale and start up full-scale aqueous recovery operations in Nov 2005 and Feb 2006, respectively. NNSA is requiring that "applicable" TA-55 interim TSRs first be implemented for both lines to address the building leak-path issue; it appears appropriate for NNSA and LANL to formally agree on specifically which new TSR controls must be implemented and verified as a pre-start for these operations. Some of the other steps required to support full-scale startup are: (a) resolution of remaining questions on effectiveness of safety basis controls (e.g., hydrogen generation); (b) closure of pre-start findings and definition of path-forward for post-starts from the LANL June 2005 readiness assessment (RA); (c) final LANL & NNSA RAs, covering also applicable interim TSRs; and (d) opening safe disposition pathways for residues and waste, preferably including the pyrolysis pathway (site rep weeklies 9/16/05, 5/27/05).

NNSA Type B Accident Investigations: NNSA has completed its investigation into the TA-48 acid inhalation injuries; the investigation into the Am-241 release continues (site rep weekly 8/12/05). Among conclusions from the former are that the acid injuries resulted from mixing and using acids outside a functional hood; those involved did not believe that a reportable accident had occurred; management did not ensure that workers recognized the full extent of hazards or that the workers were trained in the work control process or that the workers followed institutional practices; the workers' drive to accomplish research took priority over housekeeping, even though both had equivalent hazards; by reducing oversight and field presence, the NNSA Site Office (LASO) lost an opportunity to gauge the LANL integrated work management process; LASO followup on previous investigations has not driven LANL to establish a robust line management assessment program; LASO followup has also been slow, indicating weak NNSA commitment to using feedback to drive improvements.

Management: The LANL Institutional Assurance Board (IAB) and the Nuclear Safety Executive Board (NSEB) have been increasingly effective; LASO participation with these boards has dropped, which is unfortunate. The IAB does change control for the Operational Efficiency Project, while the NSEB reviews closure of PAAA corrective actions. LANL staff presentations before the NSEB also provide a uniquely useful and succinct analysis on the state and direction of LANL nuclear operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 21, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 21, 2005

Rosen was on site this week for the annual plutonium surveillance and monitoring conference.

DOE Independent Oversight: The DOE Office of Independent Oversight and Performance Assessment (DOE-OA) has completed their on-site review of NNSA and LANL; the site expects the first draft report for factual accuracy review by Nov 4th. Preliminarily, DOE-OA found resumption-related corrective actions in general and integrated work management (IWM) implementation in particular to be lagging from where they ought to be at this stage; also, both federal and contractor assessment systems, including issue management, warrant improvement. The DOE-OA team received full cooperation. Based on the review's thoroughness, the team's report ought to provide a well-substantiated snap-shot of the site's condition as the site prepares for contract transition.

Plutonium Facility (TA-55): LANL has completed a readiness assessment (RA) on implementation of safety basis controls for enhanced external security measures at TA-55 (site rep weekly 10/7/05). There were no pre-start findings; the 4 post-start findings and 5 observations focus on sustainability of controls such as vehicle speed limits.

Fire Protection: On Oct 3rd, LANL submitted to LASO an improved integrated plan to address fire protection issues and achieve site-wide improvements, as requested by a Board letter dtd 5/31/05 (site rep weekly 9/2/05). The plan covers staffing, fire hazard analyses, the 2004 emergency service baseline needs assessment, county fire dept contract, fire alarm system replacement project, and wild-land fire management. LANL based the plan on benchmarks with other DOE sites (e.g., SRS, LLNL) and plans to increase fire protection program funding in FY-06 by 50 % above the FY-05 target.

Nuclear Material Stabilization: During this week's conference, LANL reported that they continue to be on track to achieve the accelerated risk reduction committed to by the Secretary in DOE's latest LANL implementation plan for Recommendations 94-1/00-1 (7/23/04). Specifically, in the last two years, LANL has achieved 56 % of the overall risk reduction that is to be done by end of CY 2009. Within the last year, LANL has stayed on track by emphasizing robust packaging; processing has been limited by the long-term suspension of transuranic liquid waste receipts by the TA-50 Radioactive Liquid Waste Treatment Facility – RLWTF (site rep weeklies 7/1/05, 10/29/04). Eventually, some of this material will have to be unpackaged, processed, and repackaged or otherwise dispositioned; LANL currently expects this to take another two years (i.e., through CY 2011).

On Sep 7th, LANL submitted to NNSA a revised project execution plan for Board Recommendations 94-1/00-1. The plan accounts for impacts of the LANL-wide suspension and acknowledges that the RLWTF issues and the priority assigned to TA-18 Early Move Project have profoundly affected execution. One implicit assumption appears to be achieving increased throughput of transuranic waste within LANL and from LANL to WIPP. Specifically, in April 2005, LANL established that TA-55 will need to ship about 7.5 kCi of transuranic waste to Area G per year over 3 years; actual shipments in FY-05 from TA-55 to Area G and from Area G to WIPP were about half and about a quarter of that amount, respectively. Without improvement, the current trend could impact both mission and nuclear material stabilization activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 28, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 28, 2005

Dwyer, Jordan, Shields, and Tontodonato were on site this week reviewing preparations for contract transition. Elliott was also on site this week with an NNSA criticality safety review team.

LANL Contract Transition: Transition is scheduled for Dec 1st, 2005 to May 31st, 2006. Success requires close interaction between NNSA, the incumbent management team, and the in-coming management team, which NNSA will identify by Dec 1st. The in-coming team was required to submit a transition plan as part of their bid package, but it is not available now. The NNSA Site Office (LASO) is embargoed from discussing transition with LANL until released by the Source Evaluation Board. LANL management is planning for transition based on their best judgement of what's required.

NNSA Oversight: LASO has issues that hamper effective oversight and is not ready to manage contract transition or the new contract (e.g., site rep weeklies 9/23/05, 8/26/05). To get ready, LASO plans to enter a 3-month strategic pause in parallel with the first half of contract transition (i.e., Dec 2005 - Feb 2006), during which LASO would perform an organizational reboot by re-analyzing staffing needs, re-engineering key processes, and formalizing policies, procedures, training, and qualification. Detailed planning for the pause will occur during the next 2 to 3 weeks.

LANL would continue to operate during the pause, but LANL processes require LASO interaction and oversight. The first 3 months of contract transition is especially pivotal to ensuring not only that the new contractor starts out right but also that management and personnel stay focused on continued safe operation. LASO plans to have a small "continuity team" (e.g., ~10-20 people) focused on essential interaction. LASO also intends to rely on increased LANL oversight to compensate for decreased federal oversight during the pause, which would include cutting back on most deployed facility reps. LANL oversight and assessment processes unfortunately also have issues, and LANL appears inclined to wait and let the new contractor make improvements. Overall, it does not appear that NNSA has analyzed and understood the risks and the required risk mitigation associated with this pause, nor does it appear that corporately NNSA has systematically evaluated alternatives to the pause, such as bringing in an external federal assist team to facilitate LASO improving operations at this critical juncture.

TA-18 Early Move Project: Last Friday, NNSA approved startup of the TA-55 safeguarded trailer pad, and this week, TA-18 was de-inventoried to below Security Category I/II levels. A security-led inventory verification is underway to support a security downgrade decision. TA-18 is planning for SHEBA restart in delayed-critical mode and for a few other activities with sufficient fissile material to warrant criticality safety evaluations and formal development and implementation of controls.

On the pad startup, resolution of contractor-side issues from the June Operational Readiness Reviews are well-scrubbed, but resolution of federal-side issues are not apparent (site rep weekly 7/8/05); NNSA would benefit from a causal analysis of the latter focused on identifying systemic problems.

Chemistry and Metallurgy Research Replacement Facility Project (CMRR): Last Friday, the Deputy Secretary approved the performance baseline and construction start (Critical Decision 2/3) for the radiological lab / utility / office building (RLUOB), with scheduled completion in January 2010.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 4, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 4, 2005

Anderson, Burnfield, Jordan, and Von Holle were on site this week reviewing the status of LANL initiatives on integrated work management and conduct of engineering.

Waste Operations: LANL transuranic waste shipments to WIPP are the principal means for LANL to reduce risks associated with the lab's highest consequence nuclear accident postulated in approved safety analyses (site rep weekly 9/23/05). Rate of shipment dropped from 9 truckloads per month in September to 1 per month in October due to the priority DOE has assigned to shipments from Idaho (~80/month). NNSA expects LANL shipments to resume at a rate of 1 per week later this month.

Integrated Work Management (IWM): The staff team observes that, within the Operational Efficiency (OE) project, the safety element, which builds on the IWM initiative, still has the greatest potential to directly improve worker safety, as discussed in a Board Itr to the NNSA Administrator (7/21/05); this is also the only effort at LANL that can eventually address work planning and control commitments made by the Secretary in DOE's implementation plan for Board Recommendation 04-1.

While significant progress has been made, implementation remains incomplete and is hampered by lack of consistent and continuously visible support by both NNSA and LANL senior managers as a high priority, lack of consistent understanding of the process at all levels, and insufficient availability of qualified mentors and subject matter experts (e.g., RCTs, IH). Although not always apparent, LANL has worked hard on this initiative; there have been at least four major revisions of the IWM procedure in the last two years; these were necessary, but the turnover frustrated the workforce. The lack of common understanding of the process is closely linked to broad issues at LANL in developing effective institutional training, which LANL is separately working. The limited availability of subject matter experts may be exacerbated if process changes are made that require more documentation but thereby reduce on-floor time and reinforce the opinion of many that this is primarily a paper process.

A common factor in each of the major accidents and near-misses at LANL during the last two years has been the human performance element, and LANL now has at least four loosely-coupled pilots underway to test implementation of best practices (e.g., INPO). This "test before implementation" approach is prudent, but integration will be needed. This effort is encouraging and appears key to LANL evolving into a high-reliability organization as described in DNFSB TECH-35, Dec 2004.

Conduct of Engineering: This OE element has shown the greatest improvement during the last two years of any of the eight OE sub-projects: two years ago, LANL had some groups with self-developed partially structured approaches to engineering tasks, but no institutional program (Board Itr 1 /27/04); now, there is an institutional program focused on high hazard and nuclear facilities with a good start at developing and implementing standardized approaches and with a small cadre of formally trained and qualified system engineers. There is also growing recognition among those directly involved with engineering that if these new approaches had been taken by some past LANL projects, then startup and life-cycle costs would have been substantially reduced. That said, senior management attention is warranted to ensure sustainability and further progress; challenges include: sustaining procedure and training development; establishing clear and formal linkage to other lab-wide processes (e.g., QA, IWM, USQ); moving out smartly on a multi-year technical baseline reconstitution (only about 3 % funded in FY-06); and logically evolving applicability into lower hazard and radiological facilities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 11, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 11, 2005

Independent DOE Oversight: The DOE Inspector General Office has started a review of the TA-18 mission relocation effort, including the TA-18 Early Move and the NTS Critical Experiments Facility projects. Also, the DOE Independent Oversight and Performance Assessment Office (DOE-OA) was here this week and expects to issue a report on their review in December (site rep weekly 10/21/05).

LANL Operations: Last Monday (10/31), LANL began to implement a new operations management structure focused on consolidating operations authority and thereby addressing several major issues identified during last year's resumption reviews (site rep weeklies 9/9/05, 4/15/05). There are three key elements: the RDL – the single individual assigned authority, accountability, and ultimate responsibility for a facility and its compliance with its safety basis; institutional support organizations (ISOs), which set the standards and provide the RDL and RDL staff the tools, training, and other resources to be successful; and the responsible line managers (RLMs), who are responsible for ensuring work is done within the compliance envelope jointly and formally set with the RDL.

Chemistry and Metallurgy Research Building (CMR): On Wednesday, CMR declared a potentially inadequate safety analysis (PISA) because the locations of some safety-class fire suppression risers do not match safety basis descriptions; this could affect required actions if a riser becomes inoperable. The cognizant system engineer found the problem during a walk-down. CMR is requiring operations manager approval before securing any risers and has started the unreviewed safety question process.

Pu-238 Operations: NNSA and LANL are considering conducting a set of operational readiness reviews (ORRs) before startup of the new aqueous scrap recovery line; LANL is also reassessing the closure of several pre-start findings from LANL's June readiness assessment; schedule impacts are not yet known. Effort to resume the bench-scale operation near-term continue (site rep weekly 10/14/05).

NNSA Site Office (LASO) Strategic Pause: LASO has targeted starting its 3-month strategic pause on Nov 21st, provided planning is complete (site rep weekly 10/28/05). Objectives of the pause have shifted more to requirements and staffing analysis and to office process development, and less to training and qualification. With few exceptions, LASO management and key staff are now totally focused on planning the pause down to the level of developing improvement plans for each LASO sub-organization and for each federal employee; this already appears to be affecting federal management of the laboratory, as well as requiring increased LANL management attention.

As for direct nuclear facility oversight, LASO currently anticipates 4 deployed facility reps during the pause, compared to 9 deployed now and to 20 required per the last analysis (site rep weekly 1/7/05). LANL is assembling a team of ~10 operationally experienced contractors to backfill for some federal oversight functions now expected to lapse; some of these contractors were assisting certain nuclear facilities with implementing challenging safety bases; implementation may now slip further behind.

Without close attention, other efforts with significant nuclear safety implications may also be affected, such as: reducing Area G transuranic waste inventory, resolving the Plutonium Facility (TA-55) leak-path issue, implementing interim TSRs at TA-55, reducing the multi-year safety basis backlog, ensuring thorough and rigorous readiness reviews, and keeping the Chemistry and Metallurgy Research Building (CMR) replacement project on track to support eventual CMR decommissioning.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 18, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending November 18, 2005

Emergency Exercise: LANL responded to hazardous material found off-site Wednesday morning and then conducted its annual emergency exercise Wednesday afternoon, including activating the Emergency Operations Center (EOC). The scenario involved a simulated accident between a vehicle and an acid-loaded tanker with accompanying injuries and a toxic plume release over the town-site.

Based on activities the site rep observed, emergency response showed marked improvement compared to training drills conducted earlier this year and a no-notice exercise conducted last December (site rep weeklies 9/16/05, 12/3/04). Coordination in the EOC between NNSA, LANL, and Los Alamos County was close and commendable; this is an essential element for LANL emergency response due to the proximity of LANL facilities to the public. Considering nuclear facilities, while the probability of a major accident and off-site release is low, further pre-planning appears needed to ensure timely and effective community protective actions, including resources to implement those protective actions.

Fire Protection: On Nov 8th, LASO forwarded to NNSA headquarters (NA-10) the LANL integrated plan to address fire protection issues in the Board's letter of May 31st (site rep weekly 10/21/05). LASO expressed concerns with (a) the pace of implementing improvements until the new LANL contract is in place, (b) LANL fire protection staffing and progress on fire hazard analyses, (c) LANL use of the exemption request process, (d) lapse in forest thinning funding, and (e) the incompletely understood path-forward to finish site-wide fire alarm system upgrades.

Of particular concern are delays in completing the scope of the partial site-wide fire alarm system upgrades in LANL plutonium facilities (TA-55, CMR); the delays have been attributed to lag-time for accompanying safety basis changes. These upgrades are intended to correct long-standing problems in alarm signal transmission (site rep weeklies 1/17/03, 9/28/01), and they become even more important as LANL transfers fire department dispatch to the newly established EOC joint dispatch center.

NNSA Site Office (LASO) Oversight: The LASO 3-month stand-down to prepare for contract transition starts Monday (11/21); NNSA's contract announcement is expected the following week (12/1), which will start the 6-month contract transition. During the first half of contraction transition (Dec 2005 - Feb 2006), federal oversight at LANL will be cut to one-third of current levels and consist of a 31-person continuity team, including 4 facility reps and 3 subject matter experts, supplemented in some manner by the NNSA Service Center. LANL will also step up operational oversight by 8 to 10 people during this period. The LASO Manager will meet daily with his principal staff to assess emergent needs and shift personnel as deemed necessary (site rep weeklies 11/11/05, 10/28/05).

The scale and timing for the stand-down is unfortunate since it coincides with the first 3 months of contract transition; the federal role during this period will be pivotal to (a) setting expectations for the new contractor management team and (b) ensuring the LANL workforce, understandably anxious about the future, stays focused on continued safe operation. The daily LASO Manager meeting appears to be the key risk mitigation since the composition of the LASO continuity team was established ad hoc. At this time, the deliverables, the specs for deliverables, and the opportunities to accelerate LASO preparation for transition are incompletely defined. LASO also appears to need substantial external assistance to efficiently achieve the key objective of the stand-down – develop sound processes for managing the new contract – since the new contract will be radically different from the old one (e.g., fee determination) and is outside the experience of many LASO personnel.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 25, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 25, 2005

Waste Operations: LANL has resumed transuranic waste shipments to WIPP at the rate of one per week; shipments last Tuesday (11/15) and this Monday (11/21) were the first two made since Oct 6th (site rep weekly 11/4/05). Overall, NNSA and LANL have shipped about one-fifth of the roughly 2,000 higher activity drums that constitute the Quick-to-WIPP population. The site rep is skeptical that NNSA and LANL can meet the safety basis requirement to ship the remaining drums from this set by June 2006; limiting factors appear to be the throughput constraints on both the TRUPACT loading facility (RANT) and the visual exam and repackaging facility (WCRR), as well as possibly the availability of WIPP trucks.

Management: NNSA stated this week that it will delay the LANL contract selection announcement that was scheduled for Dec 1st. Separately, the NNSA Site Office (LASO) started its partial stand-down on Monday (11/21). Some preparations were not yet complete, such as (a) identifying and having on-board supplemental federal support (e.g., from the NNSA Service Center); (b) increasing contractor oversight; and (c) setting up reporting processes to efficiently provide management daily perspective on emergent safety issues that might require immediate attention.

Transportation: Last week, NNSA reported results of a federal readiness assessment (RA) performed in October on LANL's implementation of its nuclear transportation safety basis, which was approved in Nov 2002; the companion LANL RA was completed in May 2005. The NNSA RA team concluded that, in general, the technical safety requirements (TSRs) are adequately implemented, but there are some deficiencies in select safety management programs including fire protection, quality assurance, and configuration management. A LANL corrective action plan is due next month.

Quality Assurance (QA): Also last week, LASO approved the LANL quality assurance program (QAP) and its implementation plan and placed them under change control; this action fulfills the requirement within the Nuclear Safety Management Rule (10 CFR 830) for a DOE approved QAP. Much needs to be done to fully achieve and validate implementation: as part of the Operational Efficiency (OE) Project, LANL continues to be on track to issue 9 of 15 institutional QA procedures by end of December, as discussed in site rep weekly 9/16/05; the 6 remaining procedures are still on hold based on the expected benefit from input by the new contractor management team.

Maintenance: LANL is not in compliance with the DOE nuclear facility maintenance management order (DOE O 433.1); LASO and LANL have recently increased emphasis on bringing LANL into compliance by mid-2006. Key DOE O 433.1 requirements include submitting and receiving DOE approval of a maintenance implementation plan (MIP) and updating the MIP biennially; establishing performance metrics; identifying consensus standards; and integrating the program with other safety programs (e.g., safety basis, integrated safety management). LANL submitted an institutional MIP in June 2005, and it awaits NNSA action. LANL expects nuclear facilities to submit annual plans in December to support implementation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 2, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 2, 2005

Management: After extensive review, the LANL Corrective Action Review Board (CARB) this week concurred with comments on the resumption corrective action plan for Los Alamos Neutron Science Center (LANSCE) – the first nuclear facility to reach this milestone. The CARB now is reviewing plans for six divisions, including those for the site services contractor (KSL), the Chemistry Division, and the Weapons Engineering Tritium Facility (WETF). The CARB reviews are LANL’s primary mechanism to ensure corrective actions are consistent, complete, and sustainable across the institution.

Nuclear Safety Oversight: As reported last week, the NNSA Site Office (LASO) started its partial stand-down, involving about two-thirds of its staff, before preparations were complete. Status of those preparations is as follows:

- On Friday (11/25), LASO issued a procedure for managing emergent issues that would have been worked by “paused” federal staff; such issues will now be triaged by LASO senior staff and assigned an owner if deemed essential. The procedure has lists of the baseline essential activities and the 31 continuity team members; assignment of roles and responsibilities for the baseline activities is not stated but assumed to align with prior assignments of team members.
- Subject to LANL senior management approval, LANL has plans and is poised to embed 8 operationally experienced people as institutional oversight within LANL nuclear and higher hazard facilities; this team would report findings daily to LANL management.
- External federal support has been discussed, but none appears to be on site at this time.

Plutonium 238 Operations: On Thursday (12/1), LANL began a readiness assessment (RA) on resuming the bench-scale aqueous scrap recovery operation, as well as implementing interim technical safety requirements specific to bench-scale (site rep weeklies 10/14/05, 8/5/05); the NNSA facility rep at TA-55 is observing. In parallel, LANL is improving planning and scheduling of Pu-238 operations, centered on starting up the full-scale aqueous recovery line and addressing the large residue backlog.

On Sep 30th, LANL submitted for NNSA approval a process hazard analysis for residue pyrolysis and bench-scale hydroxide precipitation; these are essential operations for reducing risks from the legacy Pu-238 residues and from new residues that will be created by the bench-scale recovery operation when it starts. Most of the legacy residues are now in containers (e.g., slip-lid cans) within plastic bags with filters; the bagged containers have been placed on shelves in storage cages that are due for seismic upgrades. The plan had been to store bagged containers in drums, but the need to do that was obviated by DOE designating ~60 % of the cans as transuranic waste, and they have been removed. While the remaining cans have been inspected and show no exterior damage, internal degradation is likely occurring and drives the need for timely disposition. NNSA action appears to be the next step on the critical path for residue disposition but also appears to be impacted by the LASO pause.

Waste Operations: On Wednesday (11/30), LANL discovered that an improperly vented transuranic waste drum had been shipped from TA-54 storage to the TA-50 inspection facility (WCRRF). The drum had a metal clip between the drum body and lid instead of a vent filter in the lid; the clip created a vent path that prevents gas buildup but is unfiltered. To prevent recurrence, LANL is improving procedures and operator training, as well as looking for indicators of other such drums in storage.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 9, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 9, 2005

Plutonium Facility (TA-55): TA-55 is LANL's largest and most complex nuclear facility by most metrics and is currently operating under a 9-year-old safety basis and a new set of interim technical safety requirements (iTSRs) that are still being implemented. The iTSRs include compensatory measures for TA-55's dominant nuclear safety issue, which is the still-open question on effectiveness of the passive confinement strategy in the event of a major accident (site rep weekly 9/23/05). It's likely that final resolution will involve some combination of confinement ventilation, fire suppression, containerization, glove-box upgrades, material-at-risk limits, and specific administrative controls.

While their report is still draft, the recent DOE Office of Independent Oversight (DOE-OA) review at LANL raises questions on the TA-55 ventilation and fire suppression systems, as well as safety basis. LANL has actions underway that may address many – but perhaps not all – of these specific issues over time; these actions include the TA-55 Reinvestment Project, the LANL conduct of engineering technical baseline reconstitution, and the LANL efforts in response to Board Recommendation 04-2 on active confinement. Given (a) the importance of NNSA and LANL reaching timely resolution on confinement strategy and (b) the potential impacts on that resolution from these issues, it may be appropriate for NNSA to initiate a focused safety system oversight (SSO) review at TA-55 soon after the DOE-OA report is finalized, which is expected before the end of the month.

Nuclear Safety Oversight: The NNSA Site Office (LASO) partial stand-down continues (site rep weekly 11/25/05). LASO is working on a procedure to integrate federal activities during the 3-month pause, which has now been underway 3 weeks. LASO also appears poised to shift staff to address a growing backlog of LANL safety basis proposals requiring federal action; the backlog grew from 7 to about 30 during the first two weeks of the pause. The NNSA Chief of Defense Nuclear Safety (CDNS) office had 2 people on site this week focused on TA-18 and TA-55 operations; several NNSA Service Center managers were also on site Thursday to discuss future Service Center support for LASO.

On the contractor side, LANL has embedded 8 people in facilities as institutional oversight; their first weekly report to LANL management is due today and will be discussed with LASO next Tuesday.

Training: As part of the Operational Efficiency (OE) project, LANL has assessed most of its lab-wide courses (~600) and determined that the majority of course-providers have not used the systematic approach to training required by the DOE nuclear training order and LANL policy. This standard approach has five sequential steps: analyze needs; set objectives; develop materials; deliver training; and evaluate effectiveness. Full implementation would not only strengthen sustainability of many resumption-related corrective actions but also address concerns among many on the need for more meaningful and effective training. LANL plans to develop a prioritized list of courses needing improvement within the next few weeks and have a schedule for course revisions by mid-February.

Critical Experiments Facility (TA-18): Last Friday, NNSA (NA-10) approved Critical Decision 2, the performance baseline, for the Nevada Test Site critical experiments facility (CEF). Scope includes 4 of the 5 assemblies at TA-18; SHEBA is excluded. Scheduled completion is 1st Quarter FY 2010.

Am-241 Contamination Event: Last week, the LASO Manager signed the report on the NNSA Type B investigation into the inadvertent contamination release that occurred in July 2005 (site rep weeklies 8/12/05, 7/29/05). NNSA release of the report is expected shortly.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 16, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 16, 2005

Plaue was on site this week augmenting site rep coverage.

Emergency Response: The NNSA emergency operations office (NA-43) observed the NNSA Site Office (LASO) and LANL emergency exercise last month and has issued a report. It indicates that, while some areas need more work, overall performance was substantially improved compared to that observed in the exercise a year ago (site rep weeklies 11/18/05, 12/3/04).

Criticality Safety: Per LANL request, NNSA (NA-117) recently performed at LANL one of its first formal criticality safety program reviews in the complex (site rep weekly 10/28/05). The NNSA team's report states that they observed no ongoing unsafe operations from a criticality safety perspective; however, their observations indicate that the LANL program is expert-based, under-staffed, incompletely documented, infrequently assessed, and managed informally and at too low a level; overall, the program is not demonstrably compliant with applicable national consensus standards.

The NNSA team made several specific recommendations that it suggested should be implemented within 3 months to provide a formal basis for continuing operations. These recommendations center on reviewing all ongoing fissile material operations and ensuring that an explicit criticality safety analysis exists for each, that the controls developed are implemented in postings and procedures, and that appropriate configuration management is in place for all explicit and assumed engineered controls. The team asserted that, while it seems unlikely that an undiscovered hazard exists, these recommendations should be implemented expeditiously. LANL is evaluating the team's report and recommendations.

Nuclear Safety Oversight: LANL and LASO seem to be at-odds on federal access to day-to-day observations by the new LANL oversight team, but urgent discoveries would probably be quickly reported. The LANL team is still coming up to speed and has been focused on facility-entry training and introductions to operations management, such as the RDLs - several of which are also new to their positions under the new ops management structure (site rep weekly 11/11/05). Overall, the federally imposed "LANL oversight team strategy" appears to be a force-fit solution that still is developmental and that still incompletely compensates for reduced federal oversight during the LASO stand-down..

Plutonium-238 Operations: LANL is still waiting on LASO action on a process hazard analysis for residue pyrolysis, which is a key risk reduction step (site rep weekly 12/2/05); action appears delayed by the LASO stand-down. Also, LANL has finished a readiness assessment of the bench-scale aqueous recovery operation. Pre-start findings included addressing glove-box housekeeping and demonstrating safety-related component quality-level; post-start findings included improving operator knowledge of the chemical processes so that they can recognize and respond to abnormal conditions.

Critical Experiments Facility (TA-18): LANL is waiting on LASO action on a Nov 10^h proposal to decommission the 4 critical assemblies that are to move to Nevada; this appears perhaps delayed by the LASO stand-down. Decommissioning disables certain safety features required by the TA- 18 safety basis, but this looks acceptable since these machines have been de-fueled and will no longer operate at TA-18. Timely action is needed to support the Nevada Critical Assembly Facility (CEF) project, which is the key element to sustaining the national criticality safety training and experimentation program.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 23, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 23, 2005

Martin and Rauch were on site Tuesday augmenting site rep coverage.

LANL Contract: On Wednesday (12/21), DOE announced that Los Alamos National Security LLC (LANS) has been selected as the next management and operations contractor for LANL, effective June 1st, 2006. The LANS partnership includes University of California, Bechtel, Washington Group Intl, and BWX Technologies. Initial contract term is 7 years, with potential for extensions to 20 years.

Waste Operations: NNSA and LANL continue to have difficulty in achieving efficient transuranic waste operations, although efficient waste operations and shipment are key to addressing the lab's highest consequence nuclear accident postulated in approved safety analyses (site rep weekly 9/23/05). NNSA and LANL anticipate increasing to 2 shipments per week in early January and to 4 shipments per week in the Spring and thereby finish shipment of the -2,000 higher activity waste drums in the Quick-to-WIPP set by June 30th, 2006. There are challenges: for example, this schedule likely requires LANL to go to multi-shift (24/7) characterization, which increases worker risks if incorrectly done. NNSA has directed LANL to provide in January specific recommendations to improve efficiency.

Am-241 Contamination Event: NNSA now plans in mid-January to release the report and to brief the site on findings from its Type B investigation into the July 2005 release (site rep weekly 12/9/05). LANL has been taking actions based on what it knows of the issues. The NNSA briefing and report are needed to ensure that proper corrective actions are being taken with appropriate priority.

Plutonium Facility (TA-55): Monday morning, nine workers promptly evacuated the TA-55 vault following a continuous air monitor (CAM) alarm; appropriate immediate actions were taken, including securing the scene. The release was predominantly Pu-239. Five workers had positive nasal smears (-90 dpm max); three workers had contamination on gloves or booties consistent with later floor surveys (20k dpm max). Initial dose estimates should be available in January.

The workers were inventorying containers. Due to this event, TA-55 has secured material movements outside glove-boxes, and LANL has started an investigation, which is proceeding deliberately. TA-55 identified and triple-bagged a suspect container and another nearby similar container on Wednesday and radiographed these containers on Thursday. Further investigation and recovery will occur after Jan 1st

Pu-238 Operations: The readiness assessment (RA) for the bench-scale aqueous recovery operation has two open pre-start findings: (1) show compliance with quality requirements for safety-class ball-mill jars, and (2) resolve a material discrepancy on the as-delivered jar lids - the lids are aluminum instead of stainless steel, which is the material specified in the safety basis.

NNSA approved interim bench-scale operations in May 2004 based on several controls, including stainless-steel jar lids, and bench-scale operated briefly with the discrepant lids before the July 2004 lab stand-down. In July 2005, NNSA approved designating the jars and lids as safety-class in the interim technical safety requirements (iTSRs); this is one of the compensatory measures for the passive confinement strategy issue. TA-55 recently found the discrepancy while verifying the iTSRs applicable to bench-scale. Based on this and other issues, TA-55 management has put a hold on bench-scale startup, pending an independent formal causal analysis of the RA findings.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 30, 2005

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 30, 2005

The laboratory was closed this week, providing an opportunity for reflection.

LANL is in a transformation. In the long term, the contract decision last week will eventually reshape the lab and conceivably the entire nuclear weapons complex. In the short-term, this decision ended one period of uncertainty for the workforce while ushering in another. The safety implications of personnel distraction during this period have LANL management's attention.

There has been tremendous activity since the lab-wide stand-down of July 2004 and throughout this year. Indicators of LANL progress included: • resuming nuclear operations safely and deliberately within 6 months; • identifying several thousand issues during resumption and quickly addressing about 400 such issues that were deemed an unanalyzed risk or imminent danger; • establishing the Corrective Action Review Board (CARB) as an independent quality check on actions taken on the approximately 2,000 non-institutional issues found during resumption; • consolidating line responsibility for most nuclear operations at the associate director level, and consolidating operations authority with a few key individuals - the RDLs; • making substantial progress on the Operational Efficiency (OE) Project, which is intended to address weaknesses in key institutional functions, such as training and quality assurance; • resuming transuranic waste shipments to WIPP after an 18-month hiatus, and by year's end shipping about one-fifth of the roughly 2,000 higher activity drums that constitute the Quick-to-WIPP set - these shipments are key to addressing the lab's postulated highest-consequence nuclear accident; • developing and starting implementation of interim technical safety requirements (iTSRs) for the Plutonium Facility (TA-55) - these are key to continuing safe operation of TA-55 under the 9-year old safety basis and to compensating for the still-open confinement strategy question, which is TA-55's dominant nuclear safety issue; • recognizing emergent safety concerns and briefly suspending nuclear operations on at least four occasions in four separate nuclear facilities.

The key criticism may be the slow pace. The DOE Office of Independent Oversight (DOE-OA) recently summed this up well: to paraphrase - resumption-related corrective actions in general and integrated work management (IWM) implementation in particular are lagging from where they ought to be; also, both federal and contractor assessment systems, including issue management, warrant improvement (site rep weeklies 11/4/05, 10/21/05, 12/31/04). The contract competition likely hindered progress, since the commitment needed to some long-term fixes will also require long-term ownership.

On the federal side, NNSA oversight of LANL was reactionary and steadily deteriorated this year. DOE-OA also summed this up well: NNSA is not always performing effective oversight that drives continuous improvement in integrated safety management, in the contractor assessment system, and in other areas; recent efforts have focused on NNSA Site Office internal organizational matters and would benefit from management and organizational stability and increased headquarters support. The issues with NNSA oversight were best-illustrated by some of the problems that arose during the TA-18 Early Move Project, particularly with the TA-55 pad startup process (e.g., site rep weekly 7/8/05). While the Early Move Project achieved its FY-05 objectives, it adversely impacted many safety initiatives, such as nuclear material stabilization, criticality safety improvements, and TA-55 confinement strategy resolution. In the case of the TA-55 pad, programmatic priorities dominated startup to the point that restoring balanced priorities nearly derailed the Early Move Project. While LANL has taken some actions, NNSA has apparently done little to study and avail itself of lessons learned from this project.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 6, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 6, 2006

Contract Transition: NNSA is scheduled to brief the Los Alamos Alliance LLC team today on their unsuccessful bid; more details on LANS transition plans should be available 10 days after this brief.

Federal Oversight: The NNSA Site Office (LASO) is 7 weeks into a 14-week stand-down to prepare for the June Pt contract transition (site rep weekly 11/25/05). In the last month, the 8 federal staff assigned to the authorization basis (AB) group have resumed their duties in order to address a growing backlog. Also, the 3 facility reps (FRs) assigned to WETF, LANSCE, and DARHT are beginning to attend plan of the week/day meetings to increase federal awareness of the higher hazard activities occurring in those facilities; their part-time coverage (15 %) supplements 4 other FRs who are deployed full-time, primarily in plutonium and waste operations (TA-55 and TA-50/54). As a result of these shifts, LASO now has 37 people total working on continuity of LANL operations; the number directly involved with safety oversight has increased from 10 to 15 (i.e., 4 FRs, 8 AB staff, 3 SMEs).

LASO now has 88 internal and 19 external federal staff assigned to preparing for contract transition (107 total), although it doesn't appear that all are full-time. They are divided into 16 teams. While reports have inconsistencies, it appears that these teams are running about 3 weeks behind the baseline schedule on average. Most teams still expect to be done by Feb 28"; however the business model team and the contract transition team now expect to finish in mid-April and end of May, respectively.

Plutonium Facility (TA-55): TA-55 continues to radiologically characterize and to plan recovery from the Pu-239 contamination released into the vault on Dec 19^h (site rep weekly 12/23/05). Initial dose estimates for personnel involved are low (e.g., 10 - 50 mrem CEDE range, which is two orders of magnitude below the annual federal limit). Material movements outside glove-boxes remain restricted.

Based on contamination surveys and radiographs, the source appears to be an archival oxide sample from the early 1980s; the sample was packaged in a plastic screw-lid jar within a plastic bag, both within a taped, slip-lid can; the inner jar and bag failed, releasing powder into the can; the vinyl tape around the lid circumference then possibly failed, causing the release. TA-55 has triple-bagged this container and another similar container, but records indicate that there could be several dozen similar containers in the vault, including about a dozen that are near-identical. Some of these containers were on a list to be repackaged near-term as part of LANL response to Board Recommendations 94-1/00-1, but clearly this effort needs higher priority. A recovery plan is expected to be available next week.

TA-55 Confinement Strategy: This week, NNSA disapproved LANL-proposed performance criteria for safety-class plutonium containers because the criteria did not account for a eutectic-induced failure mode for plutonium metal in stainless steel packaging at above 400 C. NNSA had requested the criteria last September as part of developing a path-forward for the TA-55 confinement strategy issue (site rep weekly 9/23/05). The LANL proposed criteria are based on 10 accident scenarios, mostly involving Pu-238 containers. It's not clear that LANL considered all applicable Pu-239-related scenarios (e.g., vault fire) or whether these criteria will contribute in a readily justifiable manner to addressing the confinement strategy question; the picture is incomplete, particularly due to questions on pedigree of current Pu-238 and Pu-239 packaging. LANL owes refined accident analyses to NNSA this month that hopefully will focus future actions for the confinement issue (site rep weekly 9/16/05).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 13, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending January 13, 2006

Jordan was on site this week augmenting site rep coverage.

Plutonium Facility (TA-55): Thursday evening (1/12), LANL placed TA-55 in standby (Mode 2) and established a 2 hour roving fire watch due to suspected failure of a 17-year-old fire alarm system component that is no longer made. Last year, NNSA designated this system as safety-significant as one of the compensatory measures for the confinement strategy issue. LANL plans to eventually replace the system as part of the TA-55 reinvestment project. On Friday (1/13), NNSA approved LANL's proposed path-forward, which involves modifying the system and testing at least one alarm device in each of the roughly 200 zones before removing the fire watch and returning to operations.

In addition to the above, LANL continues its deliberate investigation and recovery planning for the vault contamination of Dec 19th. Followup on suspect packaging has led to checking containers in CMR and TA-35(TA-55). LANL also appears on schedule to submit by Jan 31st its refined analysis of the passive confinement strategy (site rep weeklies 9/16/05, 9/23/05).

DOE Independent Oversight: The DOE Office of Independent Oversight (DOE-SP-40, formerly DOE-OA) has issued their final reports on their October assessment of LANL and the NNSA site office (LASO); previous summaries apply (site rep weeklies 10/21/05, 12/9/05, 12/30/05). The final report on LANL emphasizes needs for: • clarifying the direction, expectations, and accountability for implementing the integrated work management (IWM) initiative; • establishing a systematic approach to address longstanding issues on the TA-55 safety basis and vital safety systems; enhancing and effectively implementing the lab's corrective action management process. The next steps are for NNSA to forward the report to LANL and for LANL to prepare a corrective action plan.

Criticality Safety: The site rep understands that a LANL plan to respond to last month's NNSA criticality safety assessment report is imminent (site rep weekly 12/16/05). The NNSA team recommended that LANL within 3 month review all ongoing fissile material operations and provide a formal basis for continuing these operations, with emphasis on ensuring that an explicit criticality safety analysis exists for each, that the controls developed are implemented in postings and procedures, and that appropriate configuration management is in place for all explicit and assumed engineered controls. Due to the extensive number of such operations (~700 in TA-55 alone), LANL plans to focus efforts before March 8th on reviewing documentation with assistance from outside experts and on correcting identified deficiencies; on-the-floor reviews would follow. While concerned about the completeness of this effort, NNSA has indicated that this is an acceptable path-forward.

Critical Experiments Facility (TA-18): The site rep understands that the effort to resume SHEBA operation remains under-funded and has decreasing priority; the probability of success appears very low based on the low priority and the similar but unsuccessful attempts last year to restart Planet and Comet. Furthermore, there are informal reports that the Nevada Test Site Device Assembly Facility (DAF) is under-funded for FY-06 and may be placed in warm-standby in March; if this does occur, it will likely impact transferring remaining TA-18 material, now at TA-55, to DAF and timely starting up operations in DAF that would support the national criticality safety research and training program.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 20, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 20, 2006

Plaue was here this week augmenting site rep coverage and reviewing nuclear waste operations.

Federal Oversight: The NNSA Site Office has resumed facility rep coverage for the Weapons Engineering Tritium Facility (WETF) because of a new operation scheduled to start in February.

Plutonium Facility (TA-55): On Monday, TA-55 completed fire alarm system repairs and resumed operations. On Thursday, TA-55 resumed normal material moves that use robust packaging; other material moves outside glove-boxes remain restricted due to the Dec 19" vault contamination event.

Integrated Safety Management (ISM): Last Tuesday (1/10), the Radio-chemistry Lab (TA-48 RC-1) had a radiation meter saturate, later attributed to procedure violations; the event was reported on Thursday (1/12) and contentiously critiqued on Friday (1/13). RC-1 has had similar events in the past; they will likely continue until more constructive feedback and improvement mechanisms are in place.

Waste Operations: Efficient waste operations and shipment are key to addressing the lab's highest consequence nuclear accident postulated in approved safety analyses (site rep weekly 12/23/05). LANL has decided to forgo 24/7 waste characterization and instead adopt a promising extended shift approach suggested by the work-force; even so, LANL expects the Quick-to-WIPP set of higher activity drums will not be shipped before October - 3 months later than the current commitment.

The site rep believes that, due to future receipts and underground inventory recovery, the risk reduction from Quick-to-WIPP may no longer be as great as NNSA once perceived (site rep weeklies 12/24/04, 11/5/04); the risk may remain high until Area G is nearly de-inventoried, now projected for early 2012. Better goals now may be to sustain and improve operations and maximize efficiency. LANL has started an aggressive improvement effort that has merit and is based on best practices at other sites (e.g., SRS). NNSA could actively support this effort, including accepting some short-term risks (e.g., seismic) to maximize efficiency; these short-term risks appear similar to those accepted for CMR.

Pu-238 Operations: Preparations continue for resuming bench-scale aqueous recovery near-term and starting up the full-scale line later this year. One bench-scale issue is that it will increase the current sizeable inventories of residues and liquid wastes, both of which do not have operating disposition pathways. The liquid waste pathway relies on RLWTF TRU operations not expected to resume until mid-2006. The residue pathway relies on pyrolysis startup and new packaging standards, related to longstanding, still-open NNSA and LANL corrective actions from a Type B investigation (Dec 2003).

On full-scale, LANL now intends to have engineered, normally-open vents for several tanks and thereby address hydrogen generation; this will require NNSA approval of new safety features. LANL now also believes that ion exchange operations will be needed soon after startup; this will require addressing shortly several other open safety issues cited in a Board letter of Aug P', 2003.

Chemistry and Metallurgy Research Replacement Facility Project (CMRR): Vendor design work on the rad lab/utility/office building (RLUOB) is highly restricted until LANL approves the vendor's quality assurance plan and audits his quality program. The NNSA Site Office has requested and LANL is preparing lessons learned from how the RLUOB quality requirements and standards were invoked.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 27, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 27, 2006

Am-241 Contamination Event: On Tuesday (1 /24), the NNSA Type B investigation team leader briefed LANL management on the findings on the Am-241 release of July 2005. The team concluded that the onsite and offsite responses provided adequate protection of the workers, the public, and the environment and that the direct cause was repeated handling of highly contaminated items without any radiological controls. The site rep will report further on this next week (site rep weekly 12/23/05).

DOE Independent Oversight: On Wednesday (1 /25), the NNSA Site Office (LASO) requested LANL to respond to the recent report by the DOE-SP Office of Independent Oversight and to provide a corrective action plan (CAP) for identified deficiencies (site rep weekly 1/13/06). Because of the similarity in institutional issues, LANL is developing an integrated CAP, expected in March, that will address the DOE-SP report, the Am-241 contamination event, and the TA-48 acid vapor inhalation injury event (site rep weekly 10/14/05). On the DOE-SP report, the site rep believes that the issues asserted on TA-55 vital safety systems warrant a timely, focused, and objective examination because of their potential impact on resolution of the confinement strategy issue (site rep weekly 12/9/05).

Plutonium Facility (TA-55): TA-55 has visually inspected and taken swipes on the exterior of the approximately 100 containers in the vault with characteristics most like the one that leaked on Dec 19th; they have found no indications of other failed packaging, including no discernable increase in contamination levels (e.g., CAMs). The plan for these containers during the next few weeks is to introduce them in small groups into a glovebox line for repackaging. Subject to the results of comprehensive surveys, limited vault operations with compensatory measures may resume next week.

Radioactive Liquid Waste Treatment Facility (RLWTF): The TA-50 transuranic (TRU) liquid waste processing system is in marginal condition (e.g., site rep weeklies 7/1/05, 10/29/04, 7/30/04). Near-term, LANL plans to resume operating the existing system in order to process current backlogs of TA-50 and TA-55 acidic solutions and to de-inventory the TA-50 existing equipment. By mid-2006, LANL intends to replace the TA-50 leaking caustic waste receipt tank, by-pass existing equipment, and install new equipment. To support near-term operations, LANL plans to invoke new operational controls for confirming system integrity and rapidly detecting and responding to leaks.

The TA-50 pump house and influent storage facility construction project is struggling. Although the expected source-term is low, NNSA designated this as a Hazard Category 2 nuclear facility in 2004 and designated several safety-significant systems, such as the structure (PC-2) and liquid confinement system (site rep weekly 2/6/04). In September, LANL took over management of construction. The below-grade concrete structure appears largely in place now, and the storage tanks are being delivered. Last week, an NNSA independent project review (IPR) team identified about a dozen concerns with the project; their final report is expected in a few days. This week, NNSA and LANL began a quality assurance review focused on the steel and concrete construction because of questions raised during the IPR team review. Based on what is known now, NNSA and LANL are considering actions, up to and including suspending the project until the issues are further understood and a path-forward is defined.

Critical Experiments Facility (TA-18): This week, NNSA approved releasing the hold on decommissioning the four critical assemblies that are to move to Nevada (site rep weekly 12/16/05).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 3, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 3, 2006

Anderson was here this week and will be here next week augmenting site rep coverage.

Plutonium (Pu) Facilities: Since at least 1999, the Pu storage standard (DOE STD-3013) has identified a potential for container failure due to a Pu metal and iron eutectic at about 400 °C and has stated that storage in stainless steel containers appears acceptable up to 250 °C. Recently, NNSA and LANL have begun to rely on container integrity to address fire scenarios and the TA-55 confinement strategy issue; however, LANL analyses for several nuclear facilities indicate temperatures in the range of 400°C to 600 °C or higher for unmitigated fires involving moderate combustible levels.

This week, LANL declared a potential inadequacy in safety analysis (PISA) for several nuclear facilities, including TA-55, due to the eutectic issue (site rep weekly 1/6/06); compensatory measures include identifying storage locations that have Pu metal and ensuring combustible loading reviews are current. Separately, LANL has slipped their proposal for resolving the TA-55 confinement strategy issue to March 31^d to allow time for an independent technical peer review; impact on DOE's ability to meet the Secretary's commitments under Board Recommendation 04-2 is unclear at this time.

Am-241 Contamination Event: The Type B investigation report discussed last week captures in one place a number of longstanding NNSA and LANL issues, such as the observation that radiological facilities receive insufficient independent oversight. Some of the needs identified include: facilities ensuring that radiological hazards are appropriately communicated, LANL institutionally ensuring that the integrated work management (IWM) initiative is consistently applied, the NNSA site office (LASO) expanding its oversight to radiological facilities, and NNSA headquarters setting oversight expectations for LASO (site rep weeklies 11/4/05, 9/23/05, 8/12/05, 7/29/05, 7/8/05).

Radiological Facilities: Since 1997, NNSA has approved downgrading more than a dozen LANL nuclear facilities to radiological status; in a few cases, NNSA and LANL credited ANSI source encapsulation or DOT special form packaging when downgrading, as permitted by DOE STD-1027. Without these exclusions, these facilities would be considered nuclear facilities (Hazard Category 2 or 3) and would have analyses done and controls implemented per the Nuclear Safety Management rule (10 CFR 830 subpart B) to prevent or mitigate accidents such as fires. Because of these exclusions, some of these facilities have radioactive inventories comparable to nearby Hazard Category 2 or 3 nuclear facilities but much less rigor in oversight and in development and implementation of controls.

On Wednesday (2/1), NNSA disapproved excluding both Pu metal and oxide items from the inventory sums for LANL radiological facilities categorized using the DOE STD- 1027 exclusion; NNSA cited the eutectic issue for metal items and the lack of justification for oxide items; this appears to reverse the previous downgrade decisions and to make 10 CFR 830 subpart B applicable to these facilities.

The site rep observes that, based on review of the references cited in DOE STD-1027, the technical basis for the prior exclusions seems insufficient to ensure that a fire in a downgraded facility will not result in a significant on-site or off-site release. Specifically, with the possible exception of the DOT Type B containers and ANSI Class 5 and 6 sealed sources, it appears that the required container testing would not demonstrate package integrity under a representative unmitigated fire scenario (e.g., 400 °C to 600 °C or higher). This may have implications to other DOE sites (site rep weekly 7/29/05).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 10, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 10, 2006

Anderson was here this week augmenting site rep coverage.

Radiological Facilities: LANL has put materials in a safer configuration due to concerns that eutectic formation might breach containers during a fire; another concern is that the encapsulation credited by DOE STD-1027 may also be ineffective in a fire. Analysis is underway to better define the concerns.

Integrated Work Management (IWM): LANL management attention has increased on improving IWM implementation and pursuing human performance initiatives (site rep weekly 11/4/05). Some of last year's pilots, such as IWM mentors, appear successful and are embraced by the workers; increased management presence on the floor and focused walk-arounds have also been effective. However, it is unclear right now how far and fast improvements can be driven before contract transition on June 1st.

Authorization Basis (AB) Verification: The NNSA Site Office (LASO) is struggling and lacks internal consensus on the level of federal and contractor verification required following AB changes, particularly following AB updates for on-going activities. Such changes are not explicitly included in the DOE startup and restart order (O 425.1C). For their part, LANL is developing an implementation validation review (IVR) process that seems based on proven best-practices at other sites.

Plutonium Facility (TA-55): Vault recovery from the Dec 19th contamination event continues (site rep weekly 1/13/06). TA-55 is moving suspect containers out of the vault and into glovebox lines for inspection and repackaging. This week, work slowed when one bulged inner can and one rusted-to-failure inner can were discovered and when concerns were raised on potentially pyrophoric contents in other cans; these represent abnormal conditions that warrant special attention. In other areas, a PF-4 evacuation drill last Thursday (2/2) revealed issues in emergency response and in drill simulation and control; the drill was complicated by contamination found on clothing for two PF-4 workers. TA-55 also reported last week that a sliding door between two glove-boxes fell and momentarily pinned a worker's gloved hand without injuring the worker; as a result, TA-55 is looking for those systems that need frequent repair and that should be placed in a routine scheduled maintenance program.

Pu-238 Operations: TA-55 management has authorized resumption of the bench-scale aqueous scrap recovery operation based on completion of a lab readiness assessment, on closure of pre-start findings, and on verification of implementation of applicable interim technical safety requirements (site rep weekly 1/20/06). Material condition of this operation has greatly improved in recent weeks. Actual startup is expected next week using a deliberate startup plan and under increased oversight.

Chemistry and Metallurgy Research Building (CMR): CMR reported this week that a Wing 5 worker found a high level of localized Am-241 contamination on the side of his hand. The contamination was removed with tape; nasal swipes were negative; the source is being investigated.

Lightning Protection: Several nuclear facility ABs cite lightning protection as performing a nuclear safety function. LANL is investigating questions on completeness of recent system inspections, including making a judgement on system operability in each nuclear and high hazard facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 17, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending February 17, 2006

Nuclear Safety Oversight: The NNSA Site Office (LASO) is within two weeks of the end of its 14-week stand-down to prepare for the June 1st contract transition (site rep weeklies 1/6/06, 11/25/05). Preparations for the stand-down were incomplete when it began, including establishing compensatory oversight mechanisms. LANL has since embedded 8 operationally experienced people as institutional oversight within the nuclear and higher-hazard facilities, and LASO has renewed its own oversight mechanisms and increased its staffing dedicated to continuity-of-operations by 20 % (i.e., to 37). Both these efforts started from scratch in early December and have grown in effectiveness during the last two months, based on the quantity and quality of operational data now being reported.

Separately, NNSA appears poised to accelerate dependence on the contractor assurance system (CAS) at LANL after the June 1st contract transition. Few details are available now on the new contractor's CAS proposal or on the CAS implementation schedule. It is also unclear how accelerated federal dependence on CAS would be consistent with recommendations on federal oversight that were made during the two recent NNSA Type B investigations and the DOE-SP Independent Oversight review (site rep weeklies 2/3/06, 12/30/05, 10/14/05).

Fire Protection: LASO has not yet formally tasked LANL to develop an updated fire protection strategy, as committed to by NNSA to the Board in a letter dated Jan 12th; the site rep believes that a near-term update of LANL's status on executing its current strategy would be more beneficial – particularly for wildfire – and that a strategy revision should be deferred until after contract transition.

Criticality Safety: By March 8th, LANL expects to finish the documentation review of its on-going fissile material operations and to finalize a criticality safety improvement plan that addresses issues identified in NNSA's Dec 2005 criticality safety assessment report (site rep weekly 1/13/06). LANL reported this week that they are about 80 % complete reviewing analyses and procedures for about 600 operations; of those completed, about 10 % (44 operations) have warranted a walk-down for further evaluation and about 5 % (22 operations) have warranted putting compensatory measures in place.

Plutonium Facility (TA-55): Pu-238 bench-scale aqueous recovery operations resumed this week. Separately, the vault recovery operation has been curtailed in order to ensure that hazard identification and controls are adequate for addressing abnormal containers; recovery should resume next week. Overall, vault decontamination appears essentially done, except perhaps for the shelf that held the container that failed on Dec 19th. The key steps now are to address suspect containers and to establish confidence that controls will be adequate for future handling and storage operations based on current knowledge of containers and their contents. Longer term, increased emphasis on stabilization and packaging (i.e., Recommendations 94-1/00-1/05-1) appears warranted to prevent recurrence.

Waste Operations: On February 7th, NNSA formally approved Critical Decision 0 (CD-0) for a new Hazard Category 2 transuranic waste facility that would be capable of processing and shipping about 1,000 drums per year after TA-54 shuts down, which is expected in 2012 per the Consent Order. Total project cost is not to exceed \$40 M. Bounding accident scenarios, safety system functional classification, and to the extent possible, all other aspects of the facility safety basis are to be defined as part of conceptual design and before CD-1, which is scheduled for the 2nd quarter of FY-07.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 24, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 24, 2006

Hunt was here this week augmenting site rep coverage.

Plutonium Facility (TA-55): LANL has placed TA-55 in standby (Mode 2) and established a continuous fire watch due to an emergent concern over operability of sprinkler heads. Extent of condition and path-forward are still being determined; initial projections are that programmatic operations may remain suspended for several weeks. The facility has begun to containerize material that is now in glove-boxes and thereby increase the margin-of-safety during a possible extended suspension. LANL is also considering whether similar concerns may apply to other LANL facilities.

The concern arose when engineering personnel were walking down the system and found that up to about half of the sprinkler heads in some rooms have paint or corrosion, which could compromise functionality of fire suppression. TA-55 fire suppression is designated safety-significant now and is being considered for re-designation as safety-class in response to the building confinement strategy issue. During this suspension, TA-55 intends to also pursue resolution of other issues, such as those identified in last year's NNSA criticality safety assessment and the DOE-SP review.

Waste Operations: On Friday, the TA-54 TRUPACT loading facility (RANT) suspended operations due to a potential inadequacy in safety analysis (PISA) involving the minimum specified riser pressure for the fire suppression system. While this suspension may be short-term, it also interferes with transuranic waste shipments from LANL to WIPP, which are key to addressing the lab's highest consequence nuclear accident postulated in approved safety analyses (site rep weekly 1/20/06).

Fire Protection: Fire scenarios dominate the high-consequence end of the risk spectrum for LANL nuclear facilities. LANL is working on corrective actions to address weaknesses in the institutional fire protection program in response to a Board letter of May 31st, 2005. The issues discussed above highlight the importance of strengthening the institutional program and oversight in this area.

Critical Experiments Facility (TA-18): TA-18 activities are dwindling and consist mostly of finishing the Early Move Project and staging sources from the Off-Site Source Recovery Program; in particular, the possibility of restarting SHEBA is remote, and planning for its decommissioning has begun. People are leaving, the customer-base is shifting elsewhere, and resources are decreasing to run TA-18 as a Hazard Category 2 nuclear facility. New focus on timely closure appears warranted.

Radiological Facilities: NNSA has concurred with LANL that there is no plutonium-oxide eutectic issue for encapsulated sources; restrictions are still in place for plutonium-metal sources. A related concern – on whether encapsulation credited by DOE STD-1027 would maintain integrity in an unmitigated fire – is apparently not being pursued, at least not locally (site rep weekly 2/3/05).

Radioactive Liquid Waste Treatment Facility (RLWTF): Last Friday (2/17), TA-55 transferred their acid liquid waste inventory to the RLWTF acid waste receipt tank. Next week, RLWTF expects to begin a management self-assessment on resuming transuranic waste operations in order to process the liquid waste backlog and de-inventory systems before planned upgrades (site rep weekly 1/27/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 3, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 3, 2006

Jordan, Owen, Schapira, and Tontodonato were here this week reviewing status of contract transition.

Fire Suppression: LANL has determined that about a third of the 2,100 sprinkler heads in TA-55 and about an eighth of the 4,600 heads in CMR have some issue that may compromise functionality; a few other LANL nuclear facilities are also affected to lesser extent. Upon review, NNSA and LANL have also concluded that the riser pressure in TA-54 RANT facility is adequate (site rep weekly 2/24/06).

TA-55 continues in stand-by and plans to replace all the sprinkler heads on the main floor (~970) and all the suspect heads in the basement this month and then to return to normal operation. The new lab-room heads will have a lower actuation temperature than current heads and generally should respond faster and reduce the release during a fire. LANL also intends now to address a long-standing issue involving low flow to a few hydraulically remote lab-room heads (site rep weekly 4/4/03). CMR has terminated normal operations for lab-rooms with suspect heads and established fire watches. Many of the CMR suspect heads appear to be in non-lab-room spaces, such as the filter towers; by focused repairs using available stock, CMR replaced many of the suspect heads in lab-rooms this week.

TA-55 Confinement Strategy: LANL has completed its refined analyses of confinement strategies (site rep weeklies 9/23/05, 9/16/05). LANL asserts there are two dominant accident scenarios: a major earthquake and a Pu-238 lab-room fire. For the former, LANL proposes completing current plans to seismically upgrade glove-box supports as safety-class. For the latter, LANL proposes retaining several existing controls plus installing a new safety-class door midway down the corridor that runs adjacent to the Pu-238 lab-rooms; the door is being designed now and may be installed this month.

For the Pu-238 lab-room fire, LANL needs to demonstrate about a factor of 75 reduction in leakage by either an engineered or administrative safety-class control. LANL proposes the following controls (factor of reduction is provided in parenthesis): current passive confinement features, such as exterior doors that are assumed closed within 5 minutes, based on refined wind boundary conditions (x4.8); the new mid-corridor door (x2.6); current Pu-238 lab-to-corridor doors, closed within 1 minute (x2.5); Pu-238 containerization and material-at-risk reduction (x2.0). The analyses assume a 10-minute ramp release from glove-boxes in a fire (x1.2) and safety-class combustible controls. Building exit training for workers and short-response sprinkler heads also increase margin. Ventilation, fire suppression, and fire alarm systems remain safety-significant with upgrades anticipated to improve their reliability.

Pu-238 Operations: It is not yet clear that LANL's confinement analyses adequately consider all scenarios, including Pu-238 scenarios. TA-55 has a significant Pu-238 residue inventory, much of it combustible and some of it in poor containers (e.g., slip lid). Opening a disposition pathway has slipped for years; pyrolysis is now suppose to start in July and stabilize these residues by early 2007.

Pu Containers: It is unclear how LANL's confinement analyses address scenarios with Pu outside glove-boxes. TA-55 has about 10,000 items; 60 % are in standard cans that may be thermally limited; 40 % are in weaker non-standard cans; 9 % have additional risk attributes; and 1 % are an elevated risk and have been moved to a glove-box or over-packed. Relatedly, TA-55 has deconned and down-posted the vault from a contamination area; respirators are still required when handling non-standard cans.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 10, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending March 10, 2006

On Thursday, LANL, NNSA, and the Board's staff had a video-teleconference on the design effort for the CMR Replacement Project's radiological lab/utility/office building (RLUOB).

Authorization Basis (AB): The NNSA Site Office (LASO) has chosen to allow the nuclear facility authorization agreements (AAs) to expire and has directed LANL to come up with another system. The AAs list the AB documents that support NNSA allowing a nuclear or high hazard facility to operate; they were updated more than a year ago as a pre-start requirement for LANL resuming such operations; they are a key compensatory measure for several LANL nuclear facilities (e.g., TA-55) that are operating with safety bases that are 7 to 10 years old (Board ltr 5/27/04, site rep weekly 3/25/05). Maintaining these old ABs typically requires 3 to 5 LANL proposals and NNSA actions per week; this pace makes it difficult keeping AAs current, but they seem essential to AB configuration management.

Criticality Safety: On Wednesday (3/8), LANL submitted results of its documentation review of 564 fissile material operations, as well as its criticality safety improvement plan that is intended to address issues from a recent NNSA NA-117 assessment (site rep weekly 2/17/06). During its review, LANL identified 64 operations (i.e., 11 %) that warranted a high-priority walk-down; of these, LANL considered 24 (4 %) warranted immediate action: 19 involved TA-55 transfer (i.e., drop) boxes where the justification for limits was not immediately apparent; 4 involved machining or sample-prep boxes where the operation had been slightly altered without a criticality review; 1 involved ensuring back-flow prevention in an acid feed line. While the remaining operations were considered acceptable, LANL raised lower-tier issues with more than half the contractor evaluations and approval actions; nearly all these cases were from documentation generated prior to mid-2003. LANL's improvement plan includes detailed walk-downs of the remaining 500 operations this year; the plan is under formal change control, and any changes are subject to concurrence of the LASO senior safety advisor.

Federal Oversight: LASO has exited its 14-week stand-down preparing for contract transition (site rep weeklies 2/17/06, 11/25/05). While some improvements were made, such as establishing a records control center, many prior problems persist, such as ineffective processes to address differing opinions, to find balanced perspective, and to achieve unity-of-purpose before decisions are made; the problems are particularly acute at the organizational interface between safety-basis and operations.

Based on its own staffing analyses, LASO suffers from an insufficient number of technically-qualified staff to perform nuclear safety oversight: only 4 of 8 LASO managers in senior technical safety manager (STSM) positions have STSM qualification; 3 of the 5 safety analysts are fully qualified, compared to about 15 needed per responsible LASO management; 3 of 16 facility reps (FRs) are fully qualified – they are deployed at 3 of the 27 LANL nuclear facilities (TA-55, CMR, and LANSCE) – it is not apparent when and how LASO plans to establish qualified FR coverage for the remainder; 6 of 7 safety and health experts appear fully qualified for their positions, compared to about 30 needed to support nuclear and non-nuclear oversight. LASO has no full-time criticality safety expertise on site, which seems inconsistent with the scale of LANL fissile material operations. LASO has essentially no funding available this year for hiring or training staff and thereby beginning to alleviate this condition.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 17, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 17, 2006

Contract Transition: Los Alamos National Security (LANS) LLC started their due-diligence facility walk-downs this week with CMR; they expect to complete a sampling of facilities by mid-April.

Federal Oversight: The NNSA Site Office (LASO) has started to reinvent itself again. NNSA has decided to move immediately at LANL into a two-year pilot of its new oversight model, which will rely heavily on LANS's still-undefined contractor assurance system. NNSA asserts that this model will not affect federal nuclear safety oversight; however, it is unclear now how NNSA, for the purposes of its oversight, intends to categorize the lower hazard nuclear facilities (i.e., the radiological facilities), nor is it clear how NNSA will ensure adequate federal oversight of shared institutional safety programs, such as fire protection, quality assurance, training, and work control. The next step appears to be for LASO to prepare an implementation plan by July 1st (site rep weekly 2/17/06).

Fire Protection: Fire scenarios dominate the high-consequence end of the risk spectrum for LANL nuclear facilities. Recent attention has focused on code-discrepant sprinkler heads (site rep weekly 3/3/06). TA-55 remains in standby and is on track to finish its planned sprinkler head replacements by the end of this month; this is being closely managed. CMR has consulted with the LANL fire protection group, has reduced the set of heads requiring immediate replacement from about 600 to about 90, and has replaced these heads, tested the system, and returned to normal operation.

Chemistry and Metallurgy Research Replacement Facility (CMRR): On Thursday (3/16), LASO concurred in a CMRR nuclear safety strategy to guide the preparation of the preliminary safety basis, which is due in draft in August. During a review two years ago, the Board's staff suggested the need for such a set of NNSA-approved guiding principles for the purpose of driving early and explicit communication and consensus on safety considerations affecting the design (site rep weekly 4/2/04).

The approved safety strategy is essentially a reiteration of the LANL preliminary hazard analysis (PHA) and the LASO safety evaluation report of a year ago (site rep weekly 3/25/05). The strategy reasserts the following as safety-class: passive building confinement, long-term storage containers, fire barriers, fire suppression (including detection), long-term vault, building structure, and glove-box supports; active ventilation would be safety-significant. While the NNSA approval letter asserts that the strategy paper's logic is both technically and fiscally sound, the technical justification consists of references to expert opinion and to the PHA of a year ago, and cost considerations are not mentioned.

A classic issue is for a DOE site to declare a set of systems as safety-class or safety-significant, and then fail to follow up on the engineering, procurement, operability, and maintainability commensurate with that quality level. Institutionally, LANL's intent has been to address this via conduct of engineering and quality assurance initiatives; however, how these initiatives will interface with the CMRR project is not clear. The suite of safety systems preliminarily selected for CMRR also exceeds that for TA-55 PF-4, even though the latter is involved with higher hazard operations; some of these controls may be appropriate to consider for back-fit into TA-55, while others may prove difficult to implement in a technically justified manner from an engineering and operations perspective.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 24, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 24, 2006

The Board and a staff team were here on Tuesday and Wednesday reviewing LANL nuclear activities. On Wednesday evening, the Board held a public hearing and meeting on LANL contract transition.

Management: The Corrective Action Review Board (CARB) is starting their review of the quality and sustainability of the TA-55 and CMR corrective actions from the 2004 resumption reviews; this is one of several reviews of higher-hazard activities that the CARB hopes to complete before the June 1st contract transition. The CARB continues to provide a stronger feedback mechanism between identified issues and their corrective actions than previously existed at LANL – in spite of the fact that most CARB members are also highly involved with transition and their other management duties.

Plutonium Facility (TA-55): TA-55 expects to complete the sprinkler head replacements today. Related modifications, post-maintenance testing, and resolution of NNSA conditions of approvals continue, and the facility expects to resume full operations (i.e., Mode 1) during the week of April 3rd.

LANL has proposed and NNSA has approved conducting NFPA standpipe flow testing before operations resume. This will require routing fire hoses through open building confinement doors for a total of four 8-hour periods. LANL plans to seal the doorways with heavy plastic and thereby maintain differential pressure. LANL also plans to station personnel at the standpipe valves and at the open doors, who can quickly secure the testing and the doors if directed by the person-in-charge.

Radioactive Liquid Waste Treatment Facility (RLWTF): Last week, a decontamination crew in proper protective equipment re-entered the underground tank vault that was the scene of the high airborne contamination incident of a year ago (site rep weekly 3/11/05). Planning for this re-entry has been extensive, in support of the planned replacement of the caustic waste receipt tank in this vault.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 31, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 31, 2006

Integrated Work Management (IWM): The LANL Director addressed the lab this week on safety-related lessons learned so far during his 10-month tenure. He emphasized that LANL continues to deliver top-level work in spite of distractions and transition-related stress; that procedures have to be followed, particularly for nuclear operations; that the integrated work documents, which capture activity-level hazards and controls, set the boundaries for bench science; that the new IWM process is necessary but not sufficient – it cannot be separated from the worker being involved in the process and thinking through the activity; and that it is constructive for people to report safety lapses and issues.

Criticality Safety: Last week, LANL organizations reported two separate criticality infractions: one involved an 11% mass and volume exceedance for an archival solution sample; the other involved an unevaluated geometry for a set of metal items that were within mass limits. Both reports resulted from heightened sensitivity of workers to criticality safety. As part of its criticality safety improvement plan, LANL plans to complete walk-downs of medium-priority processes, as well as drafts of new institutional criticality safety policies and procedures in May (site rep weekly 3/10/06).

Waste Operations: Efficient transuranic (TRU) waste operations and shipment are key to addressing LANL's highest consequence nuclear accident postulated in approved safety analyses. LANL has nearly completed characterizing the set of about 2,000 higher-activity drums in the Quick-to-WIPP program and has shipped about 860 of these drums to WIPP (i.e., 43 %); the extended-shift approach suggested by the workforce has been remarkably successful at acceleration. LANL is currently making up to 4 shipments per week, with a near-term potential to move to 7 shipments per week.

This progress is at risk due to DOE budget issues. During a Citizens Advisory Board meeting this week, NNSA and LANL stated that the FY-06 legacy waste disposition budget is being cut 28 % (i.e., from \$51M to \$37M) and that this will likely result in suspending prohibited item disposition in the WCRR Facility after the Quick-to-WIPP drums are completed in April and suspending other characterization operations in July. This is unfortunate: stopping and restarting operations is grossly inefficient compared to maintaining a steady pace; LANL has also found that a large fraction of legacy drums have items prohibited by WIPP, removing these items has tended to be rate-limiting, and safely resuming operations in aging, marginal facilities such as WCRR is difficult and time-consuming.

The basis for these funding decisions rests on the perception that shipping the 2,000 Quick-to-WIPP drums will significantly reduce the safety risks associated with LANL TRU waste operations; however, the risk reduction from Quick-to-WIPP may not be as great as NNSA once perceived (site rep weekly 1 /20/06). LANL now has roughly 25,000 drums containing more than 140 kCi above ground. By 2012, LANL expects to generate new waste and retrieve buried waste, resulting in about 50,000 drums in total that will need to be characterized and shipped. During much of this period, the total above-ground inventory is likely to remain comparable to the current level, and while the average radioactivity per drum is low, there will likely continue to be a set of drums that constitute a risk comparable to those in the Quick-to-WIPP set for some time. At the very least, a more detailed evaluation of the risks incurred from these decisions is needed; based on what is known now, the chosen course appears counter to both sound business practice and sound risk-based decision making.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 7, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: V. Anderson
SUBJECT: Los Alamos Report for Week Ending April 7, 2006

Keilers was off-site this week. Anderson was on site providing site rep coverage.

Plutonium Facility (TA-55): This week, TA-55 closed the remaining open items associated with replacing about 1,200 sprinkler heads and returned to normal operation. TA-55 management abruptly placed the facility in standby six weeks ago after a fire protection engineer reported issues with sprinkler heads that might compromise their ability to function as intended (site rep weekly 2/24/06). The facility then entered an intense period of developing engineering work packages, mustering qualified work force, installing scaffolding, replacing the questionable basement sprinkler heads and all the main-floor sprinkler heads, installing other upgrades, and completing post-maintenance tests.

Radiation Protection: It was discovered this week that a maintenance subcontractor employee working on sprinkler head replacement in TA-55 had not given the appropriate baseline bioassay samples prior to performing work that required enrollment in LANL's bioassay program.

Chemistry and Metallurgy Research Replacement Project (CMRR): In February, LANL completed a quality assurance (QA) supplier evaluation of the vendor for the rad lab/utility/office building (RLUOB) and conditionally approved the vendor proceeding into preliminary design (site rep weekly 1/20/06). The RLUOB – a radiological facility – is the first project for this vendor that contractually requires compliance with the nuclear quality assurance standard NQA-1; therefore, success will require close monitoring as the vendor develops and demonstrates its QA program.

Radioactive Liquid Waste Treatment Facility (RLWTF): The TA-50 pump house and influent storage facility construction project has been struggling but has made improvements and fully resumed construction activities last week (site rep weekly 1/27/06). LANL review of the project's quality assurance program concluded that it is largely effective, and the previously identified construction issues appear correctable. While there are significant challenges, including approval of a budget reprogramming, a path-forward seems to exist.

Critical Experiment Facility (TA-18): LASO was notified last week that substantial quantities of legacy beryllium were being stored in Warehouse 1 at TA-18. LANL conducted surveys of Warehouse 1 and CASA 1 at TA-18 to determine the extent of beryllium contamination throughout the facilities, and found that the majority of the floor in Warehouse 1 exceeds the threshold values for classification as a beryllium contamination area. Although beryllium worker training had not been required for entry to Warehouse 1, all employees assigned to work there were trained as beryllium workers. LANL is now working to identify a path forward for the beryllium stored in the warehouse and associated contamination removal so that Warehouse 1 can return to normal operations.

Contract Transition: Los Alamos National Security, Inc. (LANS) completed their due diligence facility walk-downs this week (site rep weekly 3/17/06). LANS will now pursue roll-up of and development of a path forward for issues identified during the conduct of the walk-downs.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 14, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 14, 2006

Plaue was here this week augmenting site rep coverage; Deplitch was on site Wednesday for the 90 % design review of the Planet control system for the NTS (DAF) Critical Experiments Facility.

Waste Operations: LANL's highest-consequence postulated nuclear accident scenario involves transuranic waste. This week, LANL reported several waste storage domes having large fabric tears; per the 2003 authorization basis (AB) – which has never been fully verified as implemented – this constitutes a degraded safety-class system. For worker safety, LANL has restricted access to one ripped dome. For perspective, the domes are 9 to 19 years old, compared to a 10-year suggested life, and both NNSA and LANL recognized dome degradation as an issue in 2003. When approving the AB, NNSA observed that, given the lack of effective safety systems (e.g., the domes), removal of the material-at-risk by shipment to WIPP is the only way of reducing the potential offsite consequences.

DOE, NNSA, and LANL are now on a pathway that will likely slow WIPP shipments after the Quick-to-WIPP campaign is completed. Due to DOE budget issues, LANL is slowing disposition of items prohibited by WIPP and is continuing to plan on suspending these operations in early May. No further operations are planned in the key facility for this – WCRRF – through the remainder of FY-06 and possibly longer, except for conducting periodic surveillance of essential equipment and making a modification to increase glove-box differential pressure (site rep weeklies 3/31/06, 9/16/05).

At times during the Quick-to-WIPP campaign, LANL was finding that 90 % of the legacy drums had items prohibited by WIPP that required disposition in WCRRF; with great effort, LANL increased WCRRF through-put to ~75 drums/week; it's now less than half that. Based on current information, suspending WCRRF operations seems inconsistent with timely and efficiently shipping transuranic waste to WIPP and thereby addressing one of LANL's most significant nuclear safety issues.

Pu-238 Operations: LANL's second-highest-consequence postulated nuclear accident scenario involves Pu-238 operations in TA-55, and it is exacerbated by the building confinement strategy issue. Recently, more restrictive material-at-risk controls have been proposed as part of a new confinement strategy; refinement is needed to ensure that these controls are clear and operationally effective. Separately, NNSA has approved a process hazard analysis (PrHA) for pyrolysis and for hydroxide precipitation; these are key operations for addressing the significant Pu-238 inventories in combustible residues and in liquid wastes, respectively (site rep weeklies 3/3/06, 1/20/06). Pyrolysis is scheduled to restart in July; liquid waste solidification is also being considered. LANL is also poised to submit to NNSA a substantially revised PrHA for the full-scale aqueous scrap recovery line; this revision is intended to address issues from the Board's letter of Aug 1st, 2003; the improvements look promising.

Federal Oversight: While LANL's recent efforts to address TA-55 fire suppression issues and resume operations were noteworthy, federal oversight fell below prior levels for a resumption of this importance. Last Friday, NNSA management deferred to LANL on adequacy of closure of related NNSA conditions-of-approval. Also, NNSA management directed the sole fully-qualified facility rep (FR) at TA-55 to focus on his paperwork backlog instead of monitor the contractor's decision-making process leading up to resumption; the FR did review resumption documentation. For several years, TA-55 has had only one fully-qualified FR, although by most metrics it warrants two or three.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 21, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 21, 2006

Contract Transition: Forty days remain under the UC contract. LANL has almost finished its integrated corrective action plan (ICAP) for the two recent Type B investigations and the DOE-SP review. LANL has also triaged the findings from the LANS due-diligence facility walk-downs; several findings indicate persistent weaknesses that parallel those that led to the 2004 lab suspension; LANL is pursuing several findings needing near-term attention (site rep weeklies 3/31/06, 1 /27/06).

Based on discussions, the site rep understands the following: LANS intends to address remaining findings after the June 1st transition, including mapping institutional issues from the walk-downs and the ICAP into an expanded Operational Efficiency (OE) Project; NNSA has directed LANS to provide a report on the walk-downs by May 1st and provide their plan for an expanded OE project by June 1st.

Solid Waste Operations: The DOE Carlsbad Field Office (CBFO) has assigned a "work-off team" to review LANL transuranic waste operations during the next few months, identify improvements, and assist LANL in developing a new legacy waste disposition baseline, due in mid-May. While encouraging in the longer-term, this does not alter the impending suspension of waste characterization this summer and the eventual drop in shipments after the Quick-to-WIPP campaign is finished.

Liquid Waste Operations: The transuranic liquid waste processing system in the Radioactive Liquid Waste Treatment Facility (RLWTF) is in marginal condition (site rep weekly 2/24/06). The facility has completed a readiness assessment to resume operating this system, including demonstrating procedures for confirming system integrity and for rapidly detecting and responding to leaks. Operations will likely resume next week.

Separately, NNSA has requested LANL to provide alternatives to fully upgrading the system, given the limited remaining facility life; these are also expected next week. There are tradeoffs to consider; one option is to capture more source-term upstream in TA-55, which has more robust safety systems, and thereby reduce the source-term and the operational load on the degraded systems in the RLWTF.

Authorization Basis (AB): NNSA and LANL have made little progress in the last two years on updating nuclear facility ABs; these documents capture the analyses, requirements, and controls that are the foundation for safe nuclear operations (ref: Board letter 5/27/04). For example, the safety analyses for the Chemistry and Metallurgy Research Building (CMR), the TA-55 Plutonium Facility, and the RLWTF are 8, 10, and 11 years old, respectively. TA-55 does have interim technical safety requirements (iTSRs) that were approved last year, but the iTSRs expire this summer. Also, last August, LANL proposed iTSRs for CMR and a new AB for RLWTF; these still await NNSA action.

Federal Oversight: As a result of the aging AB situation, LANL needs to propose and NNSA needs to evaluate and act upon several AB submittals per week to support continued safe nuclear operations. The ability of the NNSA Site Office (LASO) to support the status quo - much less to make progress on the aging AB backlog - has been marginal for some time (site rep weekly 3/10/06). During the next few weeks, LASO is losing several key safety analysts, which will likely exacerbate the problem.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 28, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 28, 2006

Anderson, Bamdad, Jones, Jordan, and Kasdorf were here this week reviewing the CMRR Project.

Waste Operations: Last Friday (4/21), DOE restored funding, thereby allowing LANL to continue transuranic waste characterization and avoid a drop in WIPP shipments after the Quick-to-WIPP campaign is finished. It seems appropriate for DOE, NNSA, and LANL to further study and more explicitly consider the safety risks associated with LANL transuranic waste in future budget decisions.

This week, NNSA approved: (1) changes to material-at-risk limits for the TRUPACT loading facility – RANT – that align the drum limit with the WIPP acceptance criteria; (2) continuing to operate RANT through July 2007 without seismic upgrades; and (3) loading cemented drums into TRUPACTs using a mobile loader outside the RANT building. These drums came from solidifying sludge at the Radioactive Liquid Waste Treatment Facility (RLWTF) and have low-activity. These actions generally support improving the shipping rate (site rep weeklies 4/14/06, 1 /20/06).

Chemistry and Metallurgy Research Facility Replacement Project (CMRR): The staff team that was here this week observed that the CMRR nuclear safety strategy document is a step-forward, but it's implementation needs more engineering involvement (site rep weekly 3/17/06). Design is an iterative and evolutionary process, and this project's design is clearly still evolving.

Essentially, the safety analysts, who developed the strategy, still need to define clear functional requirements for safety systems during upsets (i.e., more specific than “fire-resistant,” “impact-resistant,” and “no material release”); the engineers and designers still need to select applicable codes and standards and develop designs that clearly meet those requirements; both parties – the safety analysts and the engineers – need to work continuously and closely together to develop a satisfactory design. One area warranting attention is ensuring plutonium confinement during and following a design basis earthquake, including ensuring adequate safety system reliability and redundancy.

Fire Protection: On Tuesday (4/24), the NNSA Site Office (LASO) and LANL provided NNSA headquarters an updated status of LANL fire protection improvements (ref: Board ltr 5/31/05, NNSA ltr 1/12/06). Ensuring adequate staffing of contractor fire protection engineers and of fire-fighters remain central unresolved issues. In June, LANL plans to complete the scope of the partial site-wide fire alarm system upgrades in LANL plutonium facilities, which is positive (site rep weekly 11/18/05). Last week, LANL imposed outdoor work restrictions due to growing wild-land fire concerns.

Lightning Protection: Several LANL nuclear facilities rely on their lightning protection systems to perform a safety function; concerns with functionality of these systems were the subject of Board correspondence in 2002 and 2003. On Apr 6th, LASO provided LANL a report on a federal lightning protection assessment that was performed in October 2005; LASO's primary concern was timely correction of deficiencies found during inspections. In response to the federal review and their own reviews, LANL has centralized inspections, improved trending and tracking, and obtained the services of external certified inspectors; senior management attention this year on lightning protection has started to make a difference, but there is still much to be done (site rep weeklies 2/10/06, 6/4/04).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 5, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending May 5, 2006

Contract Transition: Twenty-six days remain under the UC contract. While LANS's top-level management and the basic operations structure are evident, it is less clear what are the key mid-level positions, who will be the key occupants, what are their qualifications, and how will LANS ensure confidence in its overall ability to control nuclear operations on and immediately following June 1st. LANS has observed LANL operations; however, LANS has not yet demonstrated readiness to analyze and control operations on a daily basis. One perspective is that DOE frequently and safely changes contracts across the complex; also, the LANS management team has extensive experience from other sites. However, DOE has not changed this contract since inception; this is probably DOE's most complex site; and few LANS senior managers have direct experience controlling LANL operations.

Much of LANS's mid-level management structure seems fluid until at least May 15th, when employee responses to offer letters are due. During that week, LANS management intends to internally review the closure of transition activities, including adaptation or modification of institutional procedures, status of outstanding issues and pre-existing conditions, and internal certification of closure of each contractually required transition area. The following week, LANS reports on closure status to NNSA and to its Board of Governors. On May 30th, NNSA reviews closure validation.

Radiological Facilities: Radiological facilities have lower source-terms and receive significantly less federal and contractor oversight than the Hazard Category (HC) 2 or HC-3 nuclear facilities, even though radiological facilities have been more prone to mishaps in the last two years (site rep weekly 2/3/06). This week, LANL reported that TA-54 Area L – a radiological facility – has received from off-site about 20 metric tons of depleted uranium (DU), which exceeds the HC-3 lower threshold (13 metric tons). LANL is de-inventorying Area L to below the HC-3 threshold and is conducting an extent-of-condition review focused on inventory tracking.

Aircraft Overflights: In 2003, LANL declared an unreviewed safety question (USQ) involving flights through LANL's restricted airspace. NNSA and LANL then implemented a compensatory measure involving explicit analysis and approval of each overflight. Over time, the fidelity of this compensatory measure has decreased. LANL recently submitted to NNSA a standalone safety basis and control set for overflights. LANL asserts that the probability of an accidental aircraft crash into a nuclear facility is small, assuming overflight activity remains about the same as during the last decade and that helicopter flight-paths are controlled. NNSA action is forthcoming.

Plutonium Facility (TA-55): NNSA has approved a process hazard analysis for assembling radiation test objects (RTOs) at unspecified locations in PF-4. Conditions of approval include: a limitation of one fissile item per activity, which will be a STD-3013 container if the item is oxide; a criticality safety evaluation for each configuration and location; a dedicated transient combustible inspection; a fire watch; and a readiness verification. RTO assemblies were previously conducted at TA-18, and the operational lessons learned from TA-18's last RTO operation should be helpful. That said, the potential for interaction with other PF-4 operations appears high and conducting a meaningful readiness verification appears difficult without a permanent assigned location. These activities appear challenging and important enough to warrant a dedicated location and a thorough readiness review.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 12, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr., LANL Site Representative
SUBJECT: Activity Report for Week Ending May 12, 2006

The site representative was at DNFSB-headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 19, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending May 19, 2006

Authorization Basis (AB): LANL now has about four dozen AB submittals at the NNSA Site Office for action, and LANL and NNSA are starting to lose track of them, including LANL's most recent recommendations for the TA-55 confinement strategy issue. On the positive side, NNSA's operational staff (FRs) are increasingly involved in federal review of proposed safety basis controls.

Contract Transition: Preparations continue for the June 1st contract transition from UC to LANS. LANS has rolled out its mid-level operations management structure, which evolved logically from the current LANL responsible division leader (RDL) structure. Their basic facility model consists of a facility operations director who will oversee mostly-matrixed functional managers for operations, maintenance, engineering, security, safety and health, waste services, and other support functions.

For the nuclear facilities, LANS has populated this management structure with an appropriate balance of new and incumbent staff, who are to complete an interim qualification process by June 1st and to achieve full qualification within 6 months. LANS is also preparing a deliberate operations plan that involves a detailed review of all on-going work within the first two months, as well as expectations that new work will be reviewed for full compliance with the integrated work management (IWM) process and that management will be engaging the workforce and observing operations.

Integrated Safety Management: Last Friday (5/12), a TA-55 pipe-fitter became contaminated (10k dpm) when he was sprayed by low-activity water while cutting an acid liquid waste line that had been flushed. The pipe-fitter was in anti-Cs and a respirator but not the waterproof acid suit required by procedure. Others involved, including safety personnel, did not interdict. The assigned supervisors were not present because they lacked respirators. While this event had minimal safety consequences, it seems to be a near-miss since the line could have had higher-activity acid waste. As a result, TA-55 suspended non-routine crafts work and held lessons-learned sessions with crafts and supervisors. TA-55 also intends to perform a causal analysis to identify further corrective actions.

TA-55 has been leading the lab in evolving a human-performance perspective on operational issues, which would apply here (site rep weekly 2/25/05). Most such events are due to latent organizational weaknesses. In this case, work-scope growth, schedule pressure, difficult work conditions, and fatigue seem to have created an environment rich in pitfalls, increasing the probability that someone was going to make an error with safety consequences; also, the waste lines are normally locked out, and the presence of water indicates a system configuration control issue. High-reliability organizations focus on learning from such events and on developing processes with defense-in-depth against errors. TA-55 seems to be on that track and needs to successfully apply these principles, particularly given TA-55's backlog of crafts work, due in part to the recent unscheduled sprinkler replacement outage.

Radioactive Liquid Waste Treatment Facility (RLWTF): Friday morning (5/19), a RLWTF tank leaked about 1,500 gal of low-activity water to a sump from where it was automatically pumped to another tank. Personnel entered the room to investigate and then within minutes evacuated when the continuous air monitor (CAM) alarmed. Preliminary data indicates no radionuclide uptakes; bioassay results will be available within 2 weeks. The cause of the leak is under investigation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 26, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 26, 2006

Anderson was here this week augmenting site rep coverage.

Criticality Safety: LANL determined this week that a nuclear facility was staging liquid plutonium residues for shipment at a location with posting that prohibited storage of hydrogenous fissile material. The event serves to re-emphasize the importance of LANL following up on its commitments in the recent criticality safety improvement plan (site rep weekly 3/31/06).

Contract Transition: This week, LANS briefed their Board of Governors and NNSA on their readiness to run LANL starting June 1st. While having concerns, LANS asserts that they are ready; their transition plan is complete; key personnel are in place; and they have working relationships in place between their management team, the work force, the community, and the customer.

Authorization Basis (AB): Most of the pre-existing conditions that LANS has identified involve operations, and several of those involve AB issues, such as the state-of-compliance with the Nuclear Safety Management rule (10 CFR 830). Particular concerns are the LANSCE safety basis, which is a piecemeal set of documents that expire in August, and the TA-55 safety basis and interim technical safety requirements; the last are not fully implemented and expire in July (site rep weekly 4/21/06).

LANS considered that the lack of configuration control of the list of AB documents, as evidenced by inaccurate and expired authorization agreements, constituted a pre-start condition for transition (site rep weekly 3/10/06). After several iterations, LANL submitted and NNSA approved last week updated authorization agreements for the Hazard Category 2 nuclear facilities.

Integrated Safety Management: On May 16th, LANL submitted to NNSA an integrated corrective action plan (ICAP) for the two recent Type B investigations and the DOE-SP review (ref: site rep weeklies 2/3/06, 1/27/06, 1/13/06, 11/4/05, 10/4/05). Key elements of the ICAP involve integrated work management (IWM); behavior based safety; oversight and assessment processes; radiological protection; safety basis; conduct of engineering; vital safety systems; and configuration management. The ICAP was developed by teams consisting of line managers and institutional subject matter experts, increasing the likelihood that the actions would be both achievable operationally and effective at addressing root causes. Both the current and the incoming LANL Directors have endorsed the plan. Schedules and resources for most actions are unspecified and left to LANS to establish.

Federal Management: NNSA's response is not evident to Type B and DOE-SP findings involving federal management, several of which have nuclear safety implications. Also, one Type B observation was that the NNSA Site Office has been ineffective at managing both federal and contractor corrective actions from prior Type B incidents, such as the August 2003 Pu-238 release with uptakes; some of those actions remain incomplete. As an example, the site rep observes that DOE, NNSA, and LANL still seem to lack clear assignment of funding and oversight responsibilities and effective cradle-to-grave management processes for Pu-238 operations (JON 12). NNSA appears challenged to identify and implement federal corrective actions, as well as oversee contractor corrective actions to closure.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 2, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 2, 2006

Contract Transition: Los Alamos National Security LLC began managing operations on Thursday.

Waste Operations: On Tuesday (5/30), Area G had a drum-drop event, resulting in 5 dented drums but no radioactive release and, fortuitously, no injuries. Specifically, a forklift operator picked up two pallets of heavier-than-expected drums from a three-pallet-high stack; while backing up, the forklift started to tip forward; 7 of the 8 drums slid off, fell to the ground, denting one drum in an adjacent row. Follow-up actions appeared appropriate. Opportunities for improvement include labeling heavier drums, better training of workers, and increasing focus on immediate actions for such events.

Pajarito Laboratory (TA-18): On May 23rd, NNSA headquarters (NA-10) announced its intent to accelerate transfer of Defense Programs activities out of TA-18 by 18 months (i.e., by Oct 1st, 2006) and not fund TA-18 infrastructure beyond FY-06. Feasibility to complete the transfer within the next four months is unclear right now. TA-18 has slid into limbo since its security downgrade last October; it still has a significant inventory of radioactive and other hazardous materials that warrant clear ownership and close management attention (site rep weeklies 10/28/05, 2/24/06, 4/7/06).

Legacy Nuclear Materials: LANL has a substantial legacy inventory throughout, particularly in TA-18, the plutonium facilities (TA-55, CMR), and waste storage (TA-54 Area G). This inventory drives the public and worker risks from LANL nuclear operations; it has nearly saturated storage for some facilities; its timely disposition affects not only safety but the lab's national security mission.

Several of LANL's highest-consequence postulated nuclear accident scenarios involve transuranic waste stored at Area G, which is near capacity. For example, the safety analysis approved in 2003 assumes that, without mitigation, a large earthquake would cause drums containing about 24 % of the Area G radioactivity to rupture without fire, leading to calculated off-site doses warranting about 2 to 3 orders of magnitude of mitigation. This week's drum-drop event illustrates that the drums are generally robust and that the safety analysis is conservative; however, the degree of conservatism is uncertain – particularly whether it constitutes 2 to 3 orders of magnitude. Updated analyses are due this month but are unlikely to improve the risk picture. Shipments to WIPP remain the primary mechanism for risk reduction.

TA-55 appears near capacity, pending more trailer startups on the safeguarded trailer pad, a temporary solution. It has unmitigated scenarios with calculated off-site consequences similar to Area G's. The highest involve Pu-238 lab room fires, exacerbated by an uncertain degree of building confinement. TA-55 has hundreds of grams of Pu-238 residues, some intermixed with combustibles in poor containers within gradually degrading plastic bags, stored in the room that was contaminated in Aug 2003; these conditions are similar to those assumed going into the worst-case accident scenarios.

TA-55 also has roughly 4,000 items in non-robust containers; these constitute a handling risk for the worker (e.g., the Dec 2005 vault contamination), and they could fail during a major accident. While TA-55 is pursuing more robust packaging, radiochemical stability is an issue, and processing has been postponed due to TA-50's transuranic liquid waste treatment problems. TA-55 would like to dispose of more residues, including the Pu-238 residues, with minimum handling and processing. This would likely require an unprecedented degree of coordination between NNSA, DOE-EM, LANL, and the WIPP contractor to establish optimum waste acceptance criteria, and a safe and efficient program.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 9, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending June 9, 2006

Jones and Jordan were here this week reviewing CMRR and augmenting site rep coverage, respectively.

Plutonium Facility (TA-55): TA-55 has declared a potential inadequacy in the safety analysis (PISA) for Pu-238 residues in higher-loaded containers because of the potential for hydrogen generation if the residues are hydrogenous and the potential for acid generation if the bagging is polyvinyl chloride. Movement of the containers has been restricted, and they will be repackaged on a priority basis.

Chemistry and Metallurgy Research Facility Replacement Project (CMRR): This week, LANL began the formal review process of the first-phase deliverables for the preliminary nuclear facility design. Both the systems engineering approach and the document review process are state-of-the-art, but both require experienced and qualified personnel for the effort to be successful. It remains unclear how NNSA will obtain the resources for the federal review, especially for safety analyses.

Operational Efficiency (OE) Project: While details are sparse, it appears that LANL (LANS) has assigned each of the OE sub-projects and related safety programs (e.g., maintenance) to an associate director and has committed to NNSA to have institutional policies and procedures in place for each by Oct 1st. To support this, LANL has consolidated responsibility for some safety programs at the division level; the new centralized safety basis and training divisions seem particularly promising.

Following Oct 1st, LANL would close out the OE Project, and further evolution of each safety program would be managed and funded through the assigned associate director and his organization. One disadvantage of this is loss of visibility into whether previously identified issues have been addressed and whether these programs have become truly effective. Presumably, the LANL contractor assurance system will provide that insight; it is also sparsely defined now but suppose to be mature by Oct 1st.

Conduct of Engineering: Conduct of engineering is typical of the safety programs within the OE Project. LANL intends that this program apply to both facility and programmatic work and has enlisted Bechtel to compare LANL policies and procedures with those of Savannah River Site and Bechtel. Success hinges on close coordination among, at least, four associate directorships that are separately responsible for engineering, maintenance (including system engineers), operations, and training. The envisioned improvements seem likely to increase efficiency and to facilitate incorporating safety into designs affecting programmatic work. So far, this appears promising.

Federal Oversight: The NNSA Site Office (LASO) continues to struggle with ensuring adequate oversight of nuclear operations (site rep weeklies 4/21/06, 3/10/06). The safety system oversight (SSO) program, which was viable before the LASO stand-down last November, now appears defunct. The facility rep (FR) program is down to 2 of 12 FRs being fully qualified, with a third nearly qualified; they are deployed at LANSCE, CMR, and RLWTF; LASO is again reviewing its FR staffing needs against DOE STD-1063 criteria. LASO still has no apparent plans to bring a criticality safety expert on site full-time, which is illogical given the scale of LANL fissile material operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 16, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 16, 2006

Andersen, Hadjian, Jones, and Rizzo were here this week reviewing CMRR geotechnical information.

Chemistry and Metallurgy Research Building (CMR): This afternoon, a researcher making space in a Wing 5 hood inadvertently spilt an unknown liquid that spontaneously ignited. The researcher extinguished the fire. LANL emergency personnel responded, and the situation appears under control.

Plutonium Facility (TA-55): Last Friday (6/9), a KSL worker sustained first and second degree burns on one hand due to a malfunction of a soldering torch; he was working under a glove-box in a Pu-238 lab room and was wearing cotton anti-Cs and rubber gloves. KSL suspended work using this type of torch and is investigating the event, including the personal protective equipment requirements.

Also last week, LANL proposed that TA-55 continue to operate under the interim technical safety requirements (iTSRs) until the new safety basis is completed. When approving the iTSRs, NNSA required that they expire on July 28th, 2006. The iTSRs – which are still not fully implemented – capture compensatory measures to address the passive confinement issue discussed below, as well as other needed controls identified since the last safety basis approval in 1996 (site rep weekly 8/5/05).

Recommendation 04-2: In 2004, the Board recommended that DOE disallow reliance on passive confinement and require an active confinement ventilation system for defense nuclear facilities with the potential for radiological release. For Hazard Category 2 facilities, such as TA-55, the Board stated an expectation that these systems would be categorized as safety-class or safety-significant, depending on a conservative application of DOE-approved methodology, and that they would be designed and maintained to function during abnormal and accident conditions. The Secretary accepted this in March 2005. The Board subsequently accepted DOE's implementation plan (IP).

In accordance with the IP, DOE has developed confinement ventilation performance criteria and a structured evaluation process. It involves teams identifying gaps between the ventilation system, the criteria, and the safety basis; reviewing potential upgrades using a structured cost-benefit approach; and recommending to the Program Secretarial Officer those upgrades needed to enhance ventilation reliability under normal and accident conditions. DOE has committed to pilot the process with TA-55.

In a parallel but uncoupled effort, NNSA and LANL have doggedly pursued refining their analyses to justify TA-55's passive confinement strategy, in spite of Recommendation 04-2 observations on the credibility of such analyses. Last August, NNSA expressed doubt that TA-55's ventilation system meets even safety-significant requirements (site rep weekly 8/5/05). In March, LANL observed that neither passive nor active ventilation confinement is sufficient and proposed a series of controls (site rep weekly 3/3/06). LANL's conclusion that active confinement is ineffective is counter to their calculations of a year ago and is based on subsequent model tuning. NNSA has not yet acted on LANL's recommendations, which focus on installing a safety-class door in the corridor adjacent to the Pu-238 lab-rooms, developing safety-class containers, and seismically upgrading glove-box supports.

Perhaps, a convergent course might be for the site to implement LANL's proposed controls, to fully engage in the 04-2 pilot, and to pursue the ventilation reliability upgrades that are thus identified (related reports: 12/24/04, 3/4/05, 4/1/05, 7/15/05, 9/2/05, 9/16/05, 9/23/05, 12/9/05, 4/14/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 23, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 23, 2006

Plaue was here this week augmenting site rep coverage.

Weapons Engineering Tritium Facility (WETF): Last Friday (6/16), WETF had a tritium release to a room while workers were leak-checking secondary containers. The workers evacuated the room, and the tritium (less than 100 Ci total) was exhausted via an approved stack until Wednesday when workers in bubble suits found and fixed the source. Health consequences appear minimal (e.g., micro-rem range to the public). WETF had a similar room release in 2003 (site rep weekly 4/18/03).

Chemistry and Metallurgy Research Building (CMR): The facility's and the emergency response team's immediate actions for last Friday's hood fire were appropriate overall; the event also offers lessons learned. As followup, CMR suspended both facility and programmatic operations on Monday, conducted sweeps for unidentified legacy materials, and resumed operations in most rooms by Thursday. Other facilities have begun sweeps. LANL has started a formal investigation.

Waste Operations: Area G has several hundred transuranic waste drums with no clear disposition path because their contents exceed the WIPP drum limit (80 Ci) and the LANL repackaging facility (WCRRF) safety basis limit (56 Ci). The 2003 Area G safety basis indicates: these drums range up to 760 Ci; in total, they constitute more than 25 % of the Area G transuranic inventory but only about 1 % of the number of drums; of the 3 dozen analyzed accident scenarios, about half have predicted unmitigated off-site consequences exceeding 100 rem (CEDE), and about a third of these are due to these drums.

The choke point for disposing of these drums is WCRRF and its safety basis limit, which is driven by seismic scenarios. WCRRF is LANL's only asset with WIPP-certified capabilities for visual examination and repackaging drums with greater than 0.5 Ci. WCRRF was running well earlier this year, in spite of issues with glovebox ventilation and its 6-year-old safety basis. LANL plans to upgrade WCRRF ventilation this summer and to submit a safety basis revision this fall. LANL is also considering using CMR for drum repackaging because of its higher limits, but CMR also has seismic concerns.

Plutonium 238 Operations: TA-55's Pu-238 residue inventory is a major nuclear safety challenge (site rep weekly 6/2/06). For perspective, if designated as waste and packaged to typical Area G drum levels (i.e., 6 Ci/drum), this inventory's total volume would correspond to about a decade's worth of transuranic waste shipments from TA-55 and to about an eighth of the current number of drums in Area G.

LANL and the WIPP contractor have negotiated a tentative path-forward for Pu-238 debris waste that will allow loading drums to the WCRRF limit, 56 Ci. Paradoxically, pyrolysis of the combustible residues would generate a safer, more chemically inert ash but that material form is currently classified not as debris but as homogenous waste without an approved WIPP pathway (site rep weekly 1/20/06).

For debris waste, the tentative path-forward will require TA-55 to open containers, split the contents, and repackage residues into drums, and for WCRRF to later open, empty, and visually confirm the contents of some of the drums. There are significant handling risks involved; it would be advantageous to only have to do these steps once, preferably combined into a single WIPP-certified operation in TA-55, which would require increasing priority and coordination. LANL and WIPP are working on the path forward.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 30, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 30, 2006

Recommendation 04-2: On Friday (6/30), the staff held a teleconference with DOE and NNSA headquarters and the site on the scope and path-forward for the TA-55 pilot (site rep weekly 6/16/06).

Radioactive Liquid Waste Treatment Facility (RLWTF): On Tuesday (6/27), two workers were injured at the pump house and influent storage facility construction site. The workers were hit by a stairwell segment that was being lifted by a crane and slipped its rigging. LANL immediately suspended hoisting and rigging operations and has been releasing such operations on a case basis. LANL has also launched an investigation. One of the workers remains in critical condition.

Integrated Safety Management: Last week, LANL management reviewed safety-related occurrences during the first 3 weeks of the LANS contract and concluded that their rate and severity are greater than expected. Starting last Friday (6/23), each level of management has taken roughly a day to review the events and to brainstorm corrective actions. LANL management intends to thereby solicit input from all levels of the lab and roll it up to senior management for action in early July.

The NNSA Site Office (LASO) has forwarded to headquarters the LASO and LANL corrective action plans from last year's DOE-SP audit and two Type B accident investigations (site rep weekly 5/26/06). LASO observed that the LANL plan lacks completion dates and that headquarters' corrective actions remain undefined. For their portion, LASO closed several Type B identified needs for expanding federal oversight by citing the conceptual NNSA oversight pilot, which contrarily involves contracting federal oversight. LASO intends to validate closure of LANL corrective actions semiannually.

Waste Operations: LANL will likely curtail transuranic waste shipments to WIPP next week because of an issue found last week with head space gas samples for several hundred debris drums that had been accepted for shipment. The issue involves composite gas samples drawn from multiple waste streams, instead of the required single waste stream, and then sent to Idaho for analysis.

LANL is analyzing the risks of 3 alternatives to address the high-activity drums discussed last week:

- TA-50 WCRR Facility – this facility is WIPP compliant and operational but restricted to 56 Ci by inventory limits in its 6-year-old safety basis; operations involve one air glove-box that will get a ventilation upgrade; WCRR requires drums to be trucked over on-site roads from TA-54.
- TA-54 DVRS Facility – this facility has an inerted glove-box and could be made operational relatively quickly; NNSA imposed more restrictive requirements on it than on WCRR, and it does not meet some requirements, such as redundant nitrogen supply. DVRS is close to drum storage, improving efficiency and reducing on-site transportation risks; however, the glove-box interferes with DVRS down-sizing waste now in ~300 plywood crates, its intended purpose.
- CMR Wing 9 basement enclosures – Wing 9 has two rooms with separate filtration that were used at one time for WIPP waste studies but are now not operational and would need a glovebox (on order); while Wing 9 appears more robust than the other options, it may not be; this option would require trucking drums to near the center of LANL's main population area.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 7, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 7, 2006

Site-wide Environmental Impact Statement (SWEIS): NNSA has issued a draft SWEIS; NNSA's preferred alternative is to expand operations, including achieving an 80 pit/year manufacturing rate.

Plutonium Facility (TA-55): NNSA has extended the interim Technical Safety Requirements (iTSRs), which LANL expects to have fully implemented this month (site rep weekly 6/16/06).

Authorization Basis: LANL is not compliant with the Nuclear Safety Management rule (10 CFR 830) because of the state of the nuclear facility safety bases; NNSA and LANL have made little progress since May 2004 when the Board issued a letter on this topic (e.g., site rep weeklies 4/21/06, 6/17/05). Last Friday (6/30), NNSA informed LANL that it expects LANL to remedy the lack of current, compliant safety bases during the next year and then to comply with the rule, including submitting high-quality annual updates; NNSA also expects LANL to manage the safety basis workload, including considering the severe constraints on federal safety basis expertise.

Operational Efficiency (OE) Project: Last week, LANL confirmed its intent to internalize the OE safety initiatives and to close the OE Project by Oct 1st. In early 2005, OE was envisioned as a multi-year effort to systematically reduce a broad spectrum of safety risks; it was the product of some hard lessons learned before and during the LANL stand-down of 2004. Since then, the scope has decreased to mainly include defining necessary resources and developing plans and procedures; implementation of many initiatives was postponed due to contract transition (site rep weeklies 6/9/06, 3/11/05).

The new LANL management intends to close OE after achieving a set of intermediate milestones; their perspective is that operational efficiency should be a way of doing business rather than a project. In parallel, LANL has launched a new project to develop an "integrated scientific-methodology-based" approach to operations, maintenance, engineering, and training. While the signals are mixed, this appears to include stepping back and considering whether program and facility work should once again be planned and executed via separate processes; this would be counter to conclusions of several NNSA and LANL accident investigations since 2002. LANL intends to have the "integrated programs" defined in September, with resource-loaded implementation plans to follow.

Feedback and Improvement: While the new LANL management has done well at issue discovery and rediscovery (e.g., critiques), they have yet to substantively improve issue management, operations, and safety. Some examples are: • last week's suspension and partial resumption of hoisting and rigging operations were informally promulgated and controlled, causing some confusion; lessons learned from prior LANL suspensions remain unaddressed (e.g., site rep weekly 8/26/05); • on Thursday (7/6), TA-55 personnel self-reported a criticality safety infraction, which led to a brief suspension of operations on Friday; such infractions are a recurring issue and the subject of a lab corrective action plan (site rep weekly 3/10/06); • last Tuesday (6/27), the Sigma Complex (TA-3-66) received a potential internally contaminated package from TA-55 that was not what was expected; there are parallels to the Am-241 contamination event of a year ago, also the subject of a corrective action plan (site rep weeklies 2/3/06, 5/31/06); • LANL has postponed their readiness assessment for starting up more trailers on the TA-55 safeguarded trailer pad because findings from the startup of the first trailer a year ago remain open (site rep weeklies 7/8/05, 10/7/05). A common theme here, which applies lab-wide, is the continuing need for followup on known issues and corrective actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 14, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 14, 2006

Accident Investigations: LANL has competent teams conducting separate investigations on the RLWTF construction accident and the CMR hood fire; the investigations are expected to be done by July 28th and Aug 16th, respectively (site rep weeklies 6/30/06, 6/23/06). The former meets criteria in DOE Order 225.1A *Accident Investigations* for a federal Type B investigation; NNSA has chosen to grant an exception rather than conduct an investigation; federal oversight of the LANL investigation consists of the NNSA project manager who is responsible for the RLWTF construction project.

Federal Oversight: On June 30th, the NNSA Site Office (LASO) submitted to headquarters its implementation plan for the two-year pilot of the new oversight model. The plan reiterates the pilot's objectives and guiding principles while providing few specifics: it discusses the high reliance on the LANL contractor assurance system, the need for risk-based prioritization of federal oversight, the need to consider unique concepts for headquarters interface, and the expectation that LASO management and staff will dedicate at-least half their time to the pilot. Many key questions remain open (site rep weekly 3/17/06). In the coming weeks, LASO intends to define the oversight concept and a new organization structure to support completing implementation of the pilot by Oct 1st.

Waste Operations: Transuranic waste shipments from LANL to WIPP remain suspended, not only because of the head space gas sampling issue but also an emergent concern that internal packages in debris drums may shift and thereby permit exterior radiation levels to exceed the WIPP contact limit, 200 mrem/hr (site rep weekly 6/30/06). Limited shipments may resume for non-debris waste forms.

Pajarito Laboratory (TA-18): The Chemistry and Metallurgy Research Building (CMR), Wing 9, has begun to receive and store uranyl nitrate solutions from TA-18 and is scheduled to complete receipts of both nitrate and fluoride solutions (e.g., SHEBA fuel) in September. CMR anticipates a roughly one-year campaign to convert all these solutions into oxide (site rep weekly 6/2/06).

Management: LANL is phasing out the Corrective Action Review Board (CARB) on Aug 1st, and intends to replace it with a new issue management process still under development. The CARB was established in 2005 as an independent quality check on actions intended to address the roughly 2,000 non-institutional issues found during the LANL stand-down and resumption (site rep weekly 4/8/05).

The CARB has only partially lived up to its potential. In late May, with the looming Jun 1st contract transition, the CARB reported the outcome of its reviews covering plutonium and tritium operations (i.e., NMT and ESA Divisions). The CARB observed that NMT had developed a reasonable path forward but had made insufficient progress to allow the CARB to complete its review; NMT resources were a particular concern. For tritium operations, the CARB generated comments but did not complete its review process before contract transition. Upon contract transition, NMT and ESA ceased to exist; the CARB suggested its input be passed onto the new owning divisions. The CARB is now wrapping up reviews of waste operations and the site services contractor (KSL), but these are also expected to be incomplete, similar to those for NMT and ESA. While key data is being archived and LANL management has expressed commitment to followup, their mechanism to do so is not yet apparent.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 21, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending July 21, 2006

Chemistry and Metallurgy Research Facility Replacement Project (CMRR): The project intends to use an interim seismic ground motion spectrum to support structure and component design for the next few months while the site-wide probabilistic seismic hazard analysis (PSHA) is finalized. Last month's staff review found that the PSHA and CMRR site characterization efforts were using different inputs (e.g., shear wave velocities, damping curves). While the project believes that the interim spectrum is conservative, timely resolution of differences would reduce programmatic risk.

Plutonium Facility (TA-55): TA-55 has concluded that they need to improve their glove-box glove program, based on the rate of glove failures and the informality of current glove change-out criteria.

TA-55 is also close to full implementation of the interim technical safety requirements (iTSRs), with a few exceptions that will require NNSA approval; lab verification is scheduled for early August. The key exceptions involve longstanding issues: (1) highly loaded cans of Pu-238 non-hydrogenous residues are still in the room that was contaminated in Aug 2003; (2) non-robust containers are still in use in the vault. TA-55 recently moved their higher-loaded cans of Pu-238 hydrogenous residues into a glove-box line and is still requiring respirators for vault work. Full resolution warrants priority.

Waste Operations: This week, LANL resumed characterization of transuranic debris waste and made two shipments to WIPP, consisting of non-debris waste (i.e., OSRP sources). Separately, LANL has withdrawn the proposed RLWTF safety basis submitted last September because of concerns with the submittal's adequacy; RLWTF operates now under a 1995 safety basis and 1999 iTSRs.

LANL is struggling with many issues involving transuranic waste storage, repackaging, and shipment: the fabric on safety-class storage domes is ripped; the strength of safety-class banding is questionable; some of the +20,000 safety-class drums above ground have excessive weight (i.e., greater than 1,000 lb); many of the drums will need to be repackaged, but the single repackaging facility – WCRRF – is several miles from the drums and is not authorized to repackage the roughly 300 drums that exceed 56 Ci because of seismic concerns; the single shipping facility – RANT – is not authorized to load a TRUPACT above about one-fifth of the TRUPACT radioactivity limit, also because of seismic issues.

At this point, neither NNSA nor LANL seems to understand and to be considering the relative risks of alternatives to address these issues – particularly, whether it is appropriate to take actions to address a seismic vulnerability that may also slow shipments. The risk picture is complicated because the half-dozen relevant safety bases used assumptions that differ, sometimes by an order of magnitude or more; however, they all seem to indicate that the risk is high until most drums are shipped. With a concerted effort, it ought to be possible to safely and compliantly ship the drums within a few years.

Radiological Facilities: LANL has determined that a small Pu source was brought into a radiological facility, in conflict with NNSA conditions of approval for that facility, and that the facility had lost configuration control of its material-at-risk tracking system. It's positive that these issues are being found, but they are not likely limited to this facility; as evident from last year's two Type B investigations, such facilities receive little oversight (site rep weekly 2/3/06, 10/14/05, 8/12/05).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 28, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 28, 2006

Plutonium Facility (TA-55): LANL has not yet proposed and NNSA has not yet approved a path-forward to address eight discrepancies in the interim technical safety requirements (iTSRs) that were approved a year ago. The site rep reported on the two most significant issues last week; the other six involve primarily errors in the iTSRs. The iTSRs are supposed to be implemented July 31st, and without formal resolution and approval, the basis for continuing operations appears uncertain.

Waste Operations: LANL has proposed but NNSA has not yet approved continuing to operate the TRUPACT loading facility – RANT – to an older version of its TSRs until mid-December. RANT's authorization to operate to the older TSRs expires July 31st, and RANT is not prepared to operate to the new TSRs. The new TSRs were intended, in part, to mitigate seismic concerns by further restricting the inventory, but they also reduce efficiency of waste shipments to WIPP. Since March 2005, NNSA has intended for RANT to receive seismic upgrades or shutdown. LANL has apparently not been pursuing the upgrades since last Fall, NNSA has not monitored the issue since last Fall when it dropped its SSO oversight, and the issue remains open (site rep weeklies 4/28/06, 3/18/05).

Los Alamos Neutron Science Center (LANSCE): LANL has proposed but NNSA has not yet approved continuing LANSCE operations under the current five-part safety basis through Aug 2007, as well as using updated nuclear data to calculate the 1L Target radioactive inventory. The current LANSCE safety basis, now ~5 years old, expires Aug 31st, and using old data, the target inventory is predicted to exceed a radionuclide-specific safety basis limit on Aug 9th, necessitating shutdown. Even using the new data, this safety basis limit will likely drive target replacement within a year, which may or may not be the best decision from an overall risk perspective (site rep weekly 9/2/05).

Weapons Engineering Tritium Facility (WETF): WETF has one of the newer LANL safety bases (2002), and its implementation was verified via ORR in 2004. Safety analyses show that unmitigated consequences from postulated WETF accident scenarios are about an order of magnitude lower than for TA-54 and for TA-55, but WETF still warrants safety-class controls to protect the public.

In letters in 2002 and 2003, the Board questioned the efficacy of WETF lightning protection as safety-class. In early 2004, NNSA responded by directing LANL to upgrade safety-class containerization and fire barriers, and to reevaluate WETF accident scenarios, including lightning, in the next safety basis update. While WETF has made some safety improvements, such as moving inventory into ASME-pedigree containers, NNSA and LANL management have allowed the fire barrier upgrade to slip. In 2005, NNSA disapproved a proposed safety basis update because of USQ discrepancies and passed up an opportunity to reassert the need for the fire barrier upgrade that would improve public safety. LANL expects to resubmit a safety basis update in November (site rep weekly 3/5/04).

Management: Either NNSA or the contractor should have persevered on the WETF upgrade and should have averted the artificial crises discussed above for TA-55, RANT, and LANSCE, but neither did. LANS recognized before Jun 1st the looming TA-55, RANT, and LANSCE deadlines. NNSA could have taken appropriate actions before Jun 1st, but NNSA's attention has been elsewhere. As a result of late awareness, NNSA has relinquished opportunities to exert federal authority in these cases. Collectively, these cases illustrate the slip in nuclear safety oversight here in the last two years.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 4, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 4, 2006

Broderick, Elliott, and Plaue were here this week reviewing criticality safety and TA-55 upgrade plans.

Authorization Basis: NNSA has approved LANSCE operating under its current safety basis until August 2007 and the TRUPACT shipping facility, RANT, operating under its older technical safety requirements (TSRs) through this month. For TA-55, LANL has declared a potential inadequacy in safety analysis on the interim TSR issues and plans to request NNSA approval of interim TSR changes.

Institutional Safety Programs: LANL management has acknowledged a \$200M shortfall in its FY-07 budget (i.e., ~10 %); the impact on necessary improvements to safety programs is uncertain. For example, the Operational Efficiency (OE) Project, which ends Oct 1st, identified that \$7.4M over 3 to 5 years is required to execute the OE-generated plan for technical baseline reconstitution of vital safety systems in nuclear facilities; FY-06 funding for this was \$0.2M. Similarly, the OE-related plan to systematically address about 600 institutional training issues identified during the last 3 years is estimated to cost \$44M and take 4 years; resolving these training issues appears fundamental to LANL improving other safety programs, such as work control, conduct of operations, and criticality safety. Currently, neither LANL's priorities for these improvements nor NNSA's intentions to contractually incentivize the improvements is clear; their overall priority may be decreasing.

Criticality Safety: Criticality safety is one of the LANL safety programs for which NNSA and LANL's intentions are unclear and the priority may be falling. The DOE Facility Safety Order 420.1 requires that nuclear operations satisfy the requirements of the ANSI/ANS nuclear criticality safety consensus standards, unless otherwise approved by DOE. NNSA's on-site review last Oct reported that the program was not demonstrably compliant with these standards (site rep weekly 12/16/05).

While LANL has completed high and moderate priority walk-downs of fissile material operations, LANL is falling behind on its criticality safety improvement plan, intended to bring the LANL program into compliance with the standards; the schedule is undefined now due to budget issues. For example, it's unlikely that LANL has sufficient criticality safety staff to complete the walk-downs, resolve issues, and implement the other ANSI/ANS program elements, including conducting annual oversight reviews of several hundred fissile material operations; on-site criticality staff is about half that estimated just to sustain the status quo and a quarter of that estimated to drive the improvement plan to completion in FY-07. The NNSA Site Office still lacks full-time federal expertise to provide oversight of the program. While these issues persist, NNSA and LANL are accepting higher risk than would be accepted in nuclear industry practice (site rep weeklies 3/31/06, 3/10/06, 2/17/06, 1/13/06).

Tritium Operations: LANL is moving out TA-21's remaining tritium operations and preparing to start up some higher-activity tritium operations in a TA-16 radiological facility. While the total inventory is less than a tenth of the Hazard Category (HC-)3 threshold, it seems more appropriate from a safety perspective to transfer the operations to the new radiologically-vacant WETF wing (Bldg 450), which has better safety features and has been maintained to HC-2 standards. In 2004, NNSA withheld approval of Bldg 450 startup due to WETF configuration management issues, since shown to exist at all the LANL nuclear facilities. These lab-wide issues motivated the conduct of engineering initiative and the technical baseline reconstitution discussed above (site rep weeklies 9/2/05, 7/9/04).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 11, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 11, 2006

Bamdad, Broderick, Kupferer, Plaue, Rauch, and Von Holle were here this week reviewing LANL support of Pantex; Bamdad, Broderick, and Plaue also reviewed TA-55 confinement analyses/strategy.

Pajarito Laboratory (TA-18): The first critical assembly (Planet) has been moved out for refurbishing and shipment. LANL has also proposed a new baseline for TA-18 transition; it includes relocating Off-site Source Recovery Program (OSRP) storage to TA-55 (11/06), transferring solutions to CMR (11/06), dispositioning the solutions (8/07), de-inventorying TA-55 safeguarded trailers (2/07), and downgrading TA-18 from hazard category 2 to a radiological facility (2/07) (site rep weekly 7/14/06).

Authorization Basis (AB): High quality safety bases are needed to provide reasonable assurance that nuclear facilities can operate safely in a manner that adequately protects workers, the public, and the environment, as required by the *Nuclear Safety Management* rule, 10 CFR 830. The attached table summarizes the state of LANL AB development, implementation, and verification. Nearly every facility has AB-related issues affecting both mission and safety. Overall, in spite of significant effort, NNSA and LANL have been unable to update a single AB since the Board letter of May 27th, 2004 on this topic; 10 CFR 830 requires AB's be reviewed and updated annually (site rep weekly 8/20/04).

On-Site Transportation: LANL has proposed and NNSA is reviewing an updated transportation safety document (TSD), which would be the first LANL AB update in three years. The current TSD requires that vehicle drivers are government-UC vice LANS employees. Before contract transition, NNSA approved extending the current TSD until Sep 28th to allow LANL to propose changes.

Waste Operations: LANL has shipped about 14 kCi out of Area G in the last four years, including about 11 kCi so far in FY-06. This would constitute about 10 % of the Area G inventory, but it does not reflect receipts from TA-55 and CMR; those receipts were comparable to the shipments made through April 2006, which is the last receipts data available to the site rep.

LANL transuranic waste operations are an example of where AB-related issues are affecting mission and safety; a balanced risk perspective isn't apparent. In the last two months, rate of shipments has dropped (i.e., 15 in June, 7 in July) due to non-AB characterization issues involving debris waste. To make progress, LANL has been shipping non-debris waste – specifically, high-activity OSRP sources in pipe over-pack containers. As a result, while the rate of drum shipments has been cut roughly in half, the curie shipment rate has doubled. To address NNSA seismic concerns, LANL is now quickly implementing new technical safety requirements that will limit the shipping facility's throughput for high-activity drums (site rep weeklies 7/28/06, 7/21/06).

Radioactive Liquid Waste Treatment Facility (RLWTF): RLWTF has drained the acid waste receipt tank and processed that stream, in preparation for replacing the leaking caustic receipt tank. This was the first transuranic waste processing at RLWTF since late 2004; the facility systematically found and addressed several issues before starting this evolution (site rep weeklies 4/21/06, 12/17/04).

LANL Hazard Category 2 and 3 Nuclear Facilities	Safety Basis age (years) ^a	Relative Inventory ^b	Status and Remarks
Radioactive Liquid Waste Treatment Facility (TA-50-1)	11	2	TA-50-1 is 43 years old, is in marginal condition, and is scheduled to be replaced in 2011. Its technical safety requirements (TSRs) are 7 years old.
Plutonium Facility (TA-55)	10	6,000	TA-55 has a 1-year-old set of interim TSRs that are a stop-gap measure for several nuclear safety issues. LANL is to propose a new safety basis in Sep 2006.
Chemistry and Metallurgy Research Facility (CMR)	8	4,000	CMR is 54 years old, is in marginal condition, and is scheduled to be replaced in 2013. Current safety analyses only evaluated operations to 2010.
Los Alamos Neutron Science Center (LANSCE)	4 to 6	less than 1	LANSCE is an accelerator that NNSA is requiring to operate as a nuclear facility because of its inventory. NNSA recently extended its 5-part safety basis to Aug 2007.
Waste Characterization, Reduction, and Repackaging Facility (TA-50-69)	5	50	TA-50-69's safety basis consists of a 5-year-old hazard analysis and interim TSRs. It is in marginal condition and is LANL's only operating nuclear facility for repackaging transuranic waste, now stored at Area G.
Weapons Engineering Tritium Facility (WETF)	4	70	WETF's safety basis is implemented and was verified in 2004. Fire barriers still need upgrades; Bldg 450 startup for radiological operations remains unresolved.
Critical Experiments Facility (TA-18)	4	900	LANL expects to de-inventory TA-18 and to recommend downgrading it to a radiological facility in early 2007.
On-site Transportation	4	–	The transportation safety document expires Sep 28 th ; NNSA is reviewing a proposed update.
Area G Transuranic Waste Storage (TA-54)	3	3,000	Safety basis implementation has yet to be verified, which is scheduled for Sep 2006. Area G's transuranic waste is to be shipped off site by 2012 to support Area G closure in 2015.
Radioactive Nondestructive Testing Facility (RANT)	3	70	RANT is LANL's sole transuranic waste shipping facility; because of seismic issues and confusion on its TSRs, NNSA has authorized operations until Aug 31 st .
Nuclear Environmental Sites	2	–	These are inactive underground sites; the safety basis has implications for compliance with the state's consent order.
Safe Secure Transport Facility (TA-55)	1	60	This facility is used for special nuclear material storage and was originally authorized for use until 2010.

Notes: a 2nd column is the number of years since the NNSA safety evaluation report that approved the contractor's documented safety analysis, based on the May 2006 authorization agreement and the October 2005 nuclear facility list.

b 3rd column is the maximum radioactivity assumed in safety analyses, measured in units of the Hazard Category 2 threshold in DOE STD-1027.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 18, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 18, 2006

On Wednesday, the staff held a video-teleconference with the NNSA site office on the oversight pilot.

Federal Oversight: On Oct 1st, the NNSA site office intends to increase federal presence at facilities with postulated accidents having predicted high off-site consequences (e.g., TA-54, TA-55) and to rely on LANL's developmental contractor assurance system to monitor less hazardous facilities and worker safety. Federal oversight of institutional safety programs is still being defined.

Accident Investigations: LANL's investigation of the June 30th construction accident at RLWTF is complete. While the report has not been released, it appears that the identified root causes center on lack of management's awareness of unsafe conditions and behaviors at the job-site; lack of implementation of the Integrated Work Management (IWM) process; lack of flow-down and enforcement of LANL requirements upon subcontractors; and lack of review of subcontractor history for safety issues. NNSA has accepted LANL's conclusions (site rep weeklies 7/14/06, 6/30/06).

Integrated Safety Management: LANL is investigating another serious safety event, which occurred last Friday (8/11). A subcontractor contacted 480 V while drilling a self-tapping screw into a non-nuclear facility's motor control center; the subcontractor luckily escaped injury. There are apparent parallel issues between this event, the June 30th accident, and prior LANL accidents and near-misses.

The Board observed last year the importance of the IWM initiative for improving worker safety, as well as the need for workers, supervisors, and safety professionals to understand the process and to be involved in its implementation (Board ltr 7/21/05). Progress stalled before contract transition. LANL is now exploring whether and how to change the IWM process. When considering changes, it would be worthwhile for LANL to explicitly consider the logic and trade-offs for each process step, since the current process reflects hard lessons learned found during several investigations since 2001.

Authorization Basis (AB): Both LANL and NNSA rely on subcontractors to, respectively, prepare and review safety analyses; in recent years, both have increasingly relied on one subcontractor to do both functions. It's unclear that NNSA and LANL are adequately ensuring appropriate independence.

Plutonium Facility (TA-55): TA-55 has declared that the interim technical safety requirements are fully implemented, although NNSA and LANL have not closed on the prior reported issues (site rep weekly 7/28/06). TA-55 has also lost power and ventilation a half-dozen times since June 1st, causing PF-4 evacuation; NNSA is still reviewing a March AB package for improving ventilation reliability.

Waste Operations: For budgetary reasons, LANL has curtailed the integrated plan developed last Fall to make nuclear waste operations more unified, efficient, and disciplined; NNSA approved the plan in May 2006, and it is part of the authorization agreement for waste operations (site rep weekly 9/23/05).

Pajarito Laboratory (TA-18): TA-18 has curtailed nuclear operations because a procedural change last April specifying criticality safety limits was never finalized; LANL asserts that operations have been within the limits, which have not changed recently. Operations should resume next week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 25, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending August 25, 2006

Anderson, Ogg, Plaue, and Winters were here this week reviewing legacy nuclear materials and transuranic (TRU) waste operations. This is part of a series of staff reviews focused on developing an integrated perspective of LANL's current and future nuclear operations and their safety implications.

NNSA and LANL envision dramatic increases in material through-put and operating tempo for the Plutonium Facility (TA-55) during the next six years, including an order-of-magnitude increase in pit production (~80 pits/yr), a Pu-oxide campaign to provide startup feed for the Savannah River Sites's new mixed oxide fuel plant (~80 kg/yr), and a Pu-238 heat-source campaign (~9 kg/yr). NNSA and LANL are also planning to complete roughly two billion dollars of nuclear facility investment by 2014, including an analytical chemistry and material characterization lab (CMRR), a radioactive liquid waste treatment facility (RLWTF), a TRU waste processing and shipping facility, a pit radiography facility, and TA-55 programmatic, security, and facility upgrades. By 2022, NNSA intends to consolidate such plutonium operations at an unspecified DOE site, as part of the new NNSA vision for the 2030 Complex.

While process knowledge exists, synthesis for the next decade's objectives is largely lacking, particularly for support functions (e.g., residue and waste processing). Pre-conceptual studies on pit manufacturing options are the most mature of studies contemplated and are based on recent TA-55 experience. The least desirable option from a safety perspective involves concurrently modifying rooms while conducting operations; this may become the choice by default without NNSA close engagement, not now evident.

Longstanding infrastructure problems have also allowed plutonium residue and TRU waste inventories to grow to where they impact both mission and safety, virtually ensuring failure unless addressed as a priority. For example:

- half of LANL's 9,000 nuclear material containers are non-standard and suspect.
- the 1960s-era RLWTF is a potential single point failure; it has not processed significant TRU liquid waste from TA-55 in two years.
- as a result of RLWTF issues, TA-55 has been unable to process residues, is now near its residue storage capacity, and is within 6 months of having to curtail pit operations unless resolved.
- LANL expects RLWTF TRU processing to resume during the next 18 months, starting in November, and needs it to ramp up to 2 to 5 times its previous throughput.
- LANL has been slow to pursue options (e.g., CLEAR line) to capture more source term at TA-55, the more robust facility, and thereby reduce the load on RLWTF.
- TA-55 needs to remove 30 to 60 contaminated glove-boxes within the next few years to make space for new equipment, but LANL has no capability now for large item size reduction.
- LANL has 50,000 TRU waste drums to ship to WIPP by 2010; shipment rate is limited by facility authorization basis and material condition issues; hundreds of higher activity drums still have no approved pathway off-site.
- TA-55 is nearly three decades old and at a point when equipment needs to be upgraded or replaced; however, NNSA is delaying and scaling back the TA-55 reinvestment project.

These problems are linked to some of LANL's most fundamental nuclear safety issues. For example:

- resolution of the TA-55 confinement strategy issue may depend on TA-55 reinvestment project upgrades that are now being delayed or are unscheduled (e.g., ventilation, fire protection).
- the off-site risk from TA-54 TRU waste drums remains high until nearly all the drums are shipped, according to DOE approved accident analyses.
- the LANL comprehensive nuclear materials packaging and storage plan – which was developed in response to the 2003 Pu-238 Type B investigation and the 2004 Secretary's 00-1 implementation plan – is still draft and unapproved by NNSA (ref: Secretary's ltr 7/23/04); this plan is a key element in LANL systematically and safely addressing its large plutonium residue backlog.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 1, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending September 1, 2006

On Wednesday, the staff held a video-teleconference with LANL on institutional safety programs.

Plutonium Facility (TA-55): LANL now expects to propose the upgraded TA-55 safety basis in early November; it will retain primary reliance on passive confinement as safety-class. Next week, LANL starts the confinement ventilation evaluation, per DOE's 04-2 implementation plan and assuming ventilation is safety-significant; the evaluation is due in mid-November. The selection as safety-significant is based on analyses that used non-physical assumptions and that may have considerably under-estimated confinement ventilation effectiveness (ref: Board ltr 5/31/05, site rep weekly 6/16/06).

Waste Operations: LANL resumed transuranic (TRU) debris waste shipments to WIPP last week. LANL has also proposed a safety strategy that involves using the WCRR drum repackaging facility and the RANT shipping facility to remediate and ship the above-ground higher activity drums off-site in 2007 and to support shipping the remainder of the 50,000 drums off-site during the next 4 years. The 325 above-ground higher activity drums (56 Ci or greater) constitute about 50 kCi, which is a third of the current above-ground TRU waste inventory; there are another ~300 higher activity drums with 90 kCi below ground. LANL expects to propose RANT and WCRR safety basis upgrades in October and the Area G safety basis update toward the end of 2006 (site rep weekly 7/21/06).

Integrated Safety Management: As a result of 3 near-misses, LANL held a series of employee and subcontractor meetings last week focused on electrical safety; the emphasis is on work planning and work control from the Integrated Work Management (IWM) process, particularly the roles of the person-in-charge, the plan-of-the-day, and management review and work release (site rep weekly 8/18/06). LANL has also been steadily working to improve its lock-out tag-out program and, more recently, has pursued issues with control of cranes with maintenance and inspection discrepancies.

Institutional Safety Programs: On Aug 17th, LANL submitted to NNSA an updated integrated corrective action plan, in response to last year's two Type B investigations and DOE-SP review; the plan includes developing a lab-wide IWM implementation improvement plan in January 2007. LANL has also assigned clear responsibilities for institutional safety programs to associate directors and has reiterated its commitment for achieving mature programs. Key elements include (a) an integrated set of manuals for operations, engineering, training, and maintenance, and (b) the facility operations directors as the lab's agents for consistent implementation of the institutional safety programs.

While the scope of the effort has been well studied (e.g., by the Operational Efficiency Project), the cost and implementation schedule remain undefined due to the FY-07 budget situation; LANL expects better definition in the next 4 to 8 weeks (site rep weeklies 8/4/06, 7/7/06, 6/9/09, 5/31/06, 4/21/06).

Contractor Assurance System (CAS): LANL expects the LANS Board of Governors to take action by Sep 12th on a proposed CAS description. This week, 2 LANS corporate assess/improve/modernize (AIM) teams were on site reviewing electrical safety, and nuclear and high hazard operations.

Conduct of Engineering: LANL has assigned a site chief engineer and is developing a network and procedures for the independent design authority function, which has not existed here in recent years.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 8, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending September 8, 2006

Radioactive Liquid Waste Treatment Facility (RLWTF) Upgrade Project: This week, NNSA approved with comments the preliminary hazard analysis, submitted in April, for a new hazard category 2 (HC-2) RLWTF, which would replace the current 43-year-old facility in 2010. The schedule is to complete preliminary design in mid-FY-07, final design in mid-FY-08, construction in mid-FY-10, and decontamination and decommissioning of the current facility in FY-12. Total project cost range is \$82M to \$104M. Size is ~21,000 ft². Current acquisition strategy is design-bid-build.

The dominant public hazards are chemicals used for pH adjustment (i.e., HCl and NaOH solutions); the design basis radioactive inventory (Am-241) is under 200 Ci, which is about four times the HC-2 threshold; this is one to three orders of magnitude lower than the radioactive inventories in other LANL HC-2 nuclear facilities. LANL assumes that TA-55 will start up and operate the CLEAR line and thereby reduce the new facility's source term most of the time to under 20 Ci. LANL's proposed initial functional classification includes no safety-class systems and has building structure, vehicle barriers, lightning protection, certain chemical and radioactive systems, and a natural gas seismic shut-off valve as safety-significant. The building and systems would be performance category 2 (PC-2). NNSA disagreed that the functional classification was complete and requested further evaluation, particularly of active confinement ventilation, which was proposed as defense-in-depth.

Waste Operations: NNSA and LANL continue to search for a path-forward for the high-activity transuranic waste drums reported last week; discussion focuses on whether to use the TA-54 DVRS Facility or the TA-50 WCRR Facility for repackaging these drums (ref: site rep weekly 6/30/06). The site rep believes that either facility could work for the high-activity drums and both will eventually be needed for drum repackaging. Given the activity levels (150 Ci avg, 750 Ci max), appropriate additional controls (e.g., respirators) and contingency planning appear key regardless of the selection.

Criticality Safety: An NNSA Service Center review of several of LANL's recent criticality safety evaluations has raised questions, particularly on their completeness as justification for the control set for fissile material operations. One root cause may be insufficient qualified staff to systematically accomplish the growing workload and drive the LANL criticality safety program to a state that meets DOE requirements and applicable national consensus standards (site rep weekly 8/4/06).

Federal Oversight: On Sep 1st, the NNSA Site Office provided headquarters an initial management system description for the two-year federal oversight pilot; it indicates that • federal oversight of nuclear operations will be transactional based on a graded approach; • it will rely on the contractor assurance system (CAS) to target areas needing more specific oversight; • it will include those institutional programs that nuclear facilities depend on for safe and secure operations; • non-nuclear operations that have the potential to release radiological or chemical constituents to the public will also receive federal transactional oversight. The model has the potential to increase federal oversight in facilities with postulated high-consequence accident scenarios but relies on CAS to find and respond to precursors in lower hazard facilities that have been problematic. It might be worthwhile for LASO to develop maturity metrics that guide improvements during the pilot; one useful metric would be the state of qualification of federal staff and team leaders being assigned to new positions.

Chemistry and Metallurgy Research Facility (CMR): LANL's accident investigation report for the June CMR hood fire is late and is undergoing LANL management review (site rep weekly 7/14/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 15, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 15, 2006

Gwal, Layton, March, and Matteucci were on site this week reviewing electrical and fire protection systems and programs, both site-wide and facility-specific for CMRR, TA-55, and WETF.

Infrastructure: The LANL preliminary FY-07 budget for nuclear infrastructure and operations appears, in some cases, to be less than the FY-06 budget and roughly a third of the estimated need; this could propagate longstanding declining trends in infrastructure that affect nuclear safety. The next test is how NNSA and the new LANL management reconcile the budget issues, and specifically, how they evaluate the mission vs infrastructure trade-offs. It is unclear how NNSA and LANL could achieve their long-term nuclear mission objectives without starting in FY-07 to substantively address longstanding issues with infrastructure and safety programs (site rep weeklies 9/1/06, 8/25/06, 8/4/06).

Fire Protection: The postulated highest consequence nuclear accidents at LANL are fire-related. It is unclear that LANL has adequate fire-fighting capability to respond to a nuclear facility fire, based on NNSA's long-term lack of a fire department contract with the county and lack of resolution of issues identified in a 2004 baseline needs assessment. LANL has made some progress in other areas, such as hiring 2 fire protection engineers in FY-06, and intends to hire 2 more in FY-07, subject to funding. LANL has also split the fire marshal and fire engineering functions to provide more independence and is working on fire hazard analysis updates for TA-55 and CMR (site rep weeklies 4/28/06, 6/3/05).

Plutonium Facility (TA-55): In 1996, the Board's staff noted that TA-55 lacked standard electrical analyses that are essential to ensuring personnel safety, as well as safe and reliable power (ref: Board letter and staff report 12/5/96). In 1997, LANL had a subcontractor complete these calculations. However, it seems little was subsequently done with the subcontractor's recommendations. LANL is now updating key analyses and expects them to be done in November; it's advisable for LANL to also fully and expeditiously evaluate the associated vulnerabilities and address the prior recommendations.

Electrical Systems and Safety: LANL has power grid infrastructure upgrades that are underway and that are improving the stability and reliability of site power, which is positive. On the electrical safety program, LANL has demonstrated vision in the last decade and has made major contributions to the DOE program, such as the DOE Electrical Safety Handbook; however, several LANL reviews have indicated that no real improvement has occurred in the last 3 years in the rate and severity of electrical safety mishaps; there also appears to be a strong linkage between electrical safety problems and broad weaknesses in implementation of the integrated work management (IWM) process. Current efforts are focused on improving program requirements (e.g., lock-out tag-out), improving oversight and training for subcontractors and students, and working toward more uniformity in program implementation.

On-Site Transportation: NNSA has disapproved LANL's proposed upgraded transportation safety document (TSD); NNSA asserts that the TSD did not demonstrate equivalence to federal regulations for on-site hazardous material shipments that use non-equivalent containers (site rep weekly 8/11/06).

Management: The LANS Board of Governors has approved the LANL contractor assurance system description, which now goes to NNSA; negotiations on FY-07 performance based incentives continue.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 22, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending September 22, 2006

Recommendation 04-2: The on-site team has transmitted its preliminary evaluation of TA-55's confinement ventilation to the Independent Review Panel (IRP) Chairman. The team considered 24 accident scenarios and explored five in detail that seem to benefit most from active ventilation: a seismically-induced multi-room fire, two Pu-238 room fires, a vault fire, and an ion exchanger thermal excursion. Preliminarily, the team concludes that one particular ventilation subsystem by itself might be capable of maintaining building negativity during an upset and be a worthy candidate for safety-class; the subsystem's functionality depends on avoiding smoke plugging HEPA filters; seismically upgrading glove-boxes is also key, particularly those with furnaces or other fire initiators. The team has scheduled 2 weeks for IRP review and intends to complete its evaluation by mid-November.

Plutonium Facility (TA-55): TA-55 has assigned a location and has conducted a location-specific readiness review for assembling radiation test objects (RTOs), an activity formerly done in TA-18. LANL is also conducting a readiness assessment for starting up more trailers on the TA-55 safeguarded trailer pad and thereby addressing storage constraints. In August, NNSA approved LANL's proposed TA-18 transition baseline, which includes emptying the trailers in February 2007 and completing TA-18 material shipments in August 2008 (site rep weeklies 8/11/06, 7/7/06, 5/5/06).

Pu-238 Operations: During roughly the last year, TA-55 has reduced the Pu-238 material-at-risk in the room that was contaminated in Aug 2003 by about 40 %, primarily by packaging lean residues for WIPP shipment and entering richer residues into the glove-box lines; about 500 g of residues remain.

Weapons Engineering Tritium Facility (WETF): WETF's safety posture is highly dependent on tritium inventory limits, safety-class containers and fire barriers, and its combustible control program. During the last two months, LANL has imposed compensatory measures and addressed about 400 possibly discrepant penetrations in WETF fire walls, which have a 1-hr rating. LANL is currently not pursuing upgrading select fire walls to 2-hr rating because of interferences and estimated costs that are an order-of-magnitude higher than those of 2003. WETF reviewed its combustible control program with the Board's staff last week; while the program's technical basis seems weak, its implementation is strong. WETF intends to revisit the combustible controls and the potential fire wall improvements when submitting its safety basis upgrade, tentatively expected later this year (site rep weekly 7/28/06).

Emergency Exercise: LANL conducted its annual emergency exercise on Wednesday (9/20). The scenario involved an Area G drum impact, spill, and dispersal; a subsequent unrelated nearby wild-land fire; and contaminated personnel with injuries. Protective actions appeared prompt and appropriate; however, radiological monitoring data needed to bound the release seemed excessively delayed. NNSA participated in the exercise. LANL and the LANS corporate partners are largely responsible for formal evaluation of the exercise, which is forthcoming.

Federal Oversight: NNSA has resumed conducting safety system oversight (SSO) reviews at LANL. Reviews in August and September focused on safety systems for LANSCE and for nuclear waste operations, respectively. Reports are forthcoming (site rep weekly 6/9/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 29, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr., LANL Site Representative
SUBJECT: Activity Report for Week Ending September 29, 2006

The site representative was at DNFSB-headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 6, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending October 6, 2006

LANL briefed Bader (Board Member), Keilers, and Martin on LANL's Reliable Replacement Warhead (RRW) design on Wednesday. Bader, Martin, and Rauch also had informal discussions with LANL on pit manufacturing options. Martin and Rauch attended a LANL energetic materials review.

Chemistry and Metallurgy Research Building (CMR): On Monday (10/2), the CMR fire protection engineer determined that flash-over could occur from one wing to the opposing wing across the spinal corridor and that this possibility is not addressed in the current CMR safety basis; the facility implemented compensatory measures, including a fire watch. On Wednesday, CMR secured the fire watch based on nearby combustibles being reduced to below a new calculated flash-over limit.

Management: Effective this week, LANL rolled out their contractor assurance system (CAS), and the NNSA Site Office (LASO) began their oversight pilot. Within the last two weeks, LANL has also established an institutional management review board (IMRB) to oversee the lab's new issue and corrective action management system (ICAM) and to prioritize institutional issues and corrective actions. All three of these efforts currently have low maturity, which is not unexpected. LANL has been developing the CAS since Jun 1st and intends to implement and improve the system in a deliberate manner during the next two years; the LASO pilot is on the same schedule.

For example, LANL is deploying better software for tracking performance and managing issues; CAS is highly reliant on line managers properly using these tools, establishing their own metrics, performing objective self-assessments, and faithfully following up on issues; this is the foundation of CAS. LANL line managers have performed these functions inconsistently and often poorly in the past, and LANL is starting to train managers now on how best to perform these functions in the future. For LASO, the oversight pilot depends on CAS being successful and accessible to federal oversight. LASO has also deployed more staff in nuclear facilities and has increased the pool of people assigned as subject matter experts; however, their relevant training and experience is generally low.

Institutional Safety Programs: LASO has forwarded to DOE HS-1 a new update of LANL's integrated corrective action plan that was prepared in response to last year's two Type B investigations and the DOE-OA review (site rep weekly 9/1/06). LASO recommends approval and delegation of authority to LASO for change control; LASO referenced processes it used to follow up on previous Type B investigations. The site rep observes that LASO has been unsuccessful in driving Type B corrective actions to closure, such as those still open from the Aug 2003 Pu-238 release.

This week, LANL closed the Operational Efficiency (OE) Project, which has been LANL's mechanism during the last two years for improving institutional safety programs. LANL asserts that 90 % of the OE milestones have been met and independently verified (i.e., 138 of 153). The remainder involve integrated work management (5), lock-out tag-out (1), quality assurance (1), vital safety systems (1), and training (2). LANL has assigned responsibility for followup to particular associate directors and has committed the IMRB to monitoring implementation.

Formality of Operations: LANL plans to issue an integrated set of manuals for operations, engineering, and maintenance by Oct 31st, review requirement applicability and identify gaps by mid-December, and issue a training manual and integrated implementation plans in January 2007.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 13, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 13, 2006

Waste Operations: Last Friday evening (10/6), LANL suspended Area G operations due to high contamination levels found on the bottom of one transuranic waste drum in Dome 33 (i.e., up to 0.5 M dpm alpha). Immediate actions were extensive and appropriate. Dome 33 was isolated, and work areas outside Dome 33 were released later that evening. The drum was over-packed, and access to Dome 33 has been restricted while the affected area is decontaminated. The drum breach appears recent, possibly within the prior week. No environmental, safety, or health impacts resulted.

This was a worker safety issue, but there are public safety implications. LANL appropriately suspended operations to protect the workers because the contamination extent was initially unknown. However, to protect the public, LANL depends on most drums maintaining integrity in the event of a major earthquake or other extreme upset. Due to Area G's proximity to the site boundary, LANL may be unique among DOE sites in designating drums as safety-class; however, many LANL drums are similar to this one, which was retrieved after more than a decade from underground storage and had indeterminate integrity. LANL plans to review Area G's risks and controls in its safety basis later this year and hopes to ship Area G's transuranic waste to WIPP by 2010, which is the ultimate resolution.

Chemistry and Metallurgy Research Building (CMR): Per an NNSA request, CMR resumed fire watches this week for rooms that could be potentially susceptible to flash-over across the spinal corridor during a fire. LANL intends to request NNSA approval to remove restrictions following an independent review by the LANL Fire Marshal. LANL is also considering longer-term solutions.

Pajarito Laboratory (TA-18): LANL defueled SHEBA this week, which is TA-18's last remaining critical assembly. TA-18 is storing the ~120 L of fuel solution in 20L carboys within 55 gal drums, pending shipment to CMR for storage and treatment. LANL plans to remove all of TA-18's security category III/IV nuclear material by Nov 30th, downgrade TA-18 to a radiological facility in Feb 2007, and place TA-18 into a surveillance and maintenance mode by Apr 1st, 2007 (site rep weekly 8/11/06).

Plutonium Facility (TA-55): On Sep 17th, NNSA concurred with a LANL proposed safety-significant (PC-2) switchgear modification that will increase TA-55 electrical power and confinement ventilation reliability and improve nuclear safety; the LANL proposal was submitted to NNSA in phases between Jan and Mar 2006 and has been in the works for several years. When completed, the modification will automatically close breakers to restore off-site power, if available, and will automatically transfer loads to a diesel generator if off-site power is not available. This would help minimize confinement ventilation upsets, such as those that occurred frequently this past summer (site rep weekly 8/18/06).

Authorization Basis: When a potential inadequacy in safety analysis (PISA) is discovered, the Nuclear Safety Management rule (10 CFR 830) requires contractors to place or maintain nuclear facilities in a safe condition, notify DOE, perform a USQ determination, and submit to DOE an evaluation of the safety of the situation prior to removing any operational restrictions. LANL currently has a plethora of PISAs; however, NNSA and LANL are exercising insufficient formality in tracking PISAs, and in maintaining and removing operational restrictions due to PISAs; driving PISAs to closure seems to lack priority. The site rep understands that NNSA and LANL are working to correct this situation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 20, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending October 20, 2006

The staff, NNSA, and LANL held a video-teleconference on LANL TRU waste operations on Thursday.

Accident Investigations: Last week, LANL management signed the accident investigation report for the June CMR hood fire. LANL has also issued a corrective action plan (CAP) for the June RLWTF construction accident; the CAP focuses not only on implementing integrated work management (IWM) but also on improving span-of-control, training, and execution of safety oversight by first line supervisors, managers, and safety professionals (site rep weeklies 9/8/06, 7/14/06).

Transuranic (TRU) Waste Operations: LANL has modified the WCRR repackaging facility to ensure reliable glovebox vacuum, a worker safety improvement (site rep weekly 10/14/05). NNSA and LANL have also converged on a path-forward for shipping the 325 highest-activity drums above ground in Area G to WIPP by Spring 2008; these drums contain about a third of the current above-ground inventory (i.e., ~50 kCi). By Oct 30th, LANL will propose updated safety bases for WCRR and RANT (the shipping facility) that support one year of high-activity operations. By Jan 2007, LANL will also propose a longer-term strategy for addressing large TRU-contaminated items, now stored in Area G in plywood boxes, as well as the remaining high-activity packages (~90 kCi, 300 Ci avg), which are to be retrieved from underground storage starting in FY-08 (site rep weekly 9/8/06).

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL is planning to replace the leaking caustic waste receipt tank during a weekend in November; preparations appear extensive, including the use of a mock-up to prove out processes and procedures (site rep weekly 8/11/06).

Plutonium Facility (TA-55): NNSA has not acted on LANL's proposed resolution of discrepancies in the interim technical safety requirements, which LANL declared implemented in August; the key issues involve: • non-robust nuclear material containers used in the vault, which was contaminated in Dec 2005; • Pu-238 residues still stored in the room that was contaminated in Aug 2003. Both of these are linked to still-open NNSA and LANL corrective actions in response to the Aug 2003 Pu-238 uptakes. Particularly, while WIPP recently approved new TRUCON codes and while LANL has disposed of some Pu-238 residues, NNSA and LANL have made little progress in developing packaging standards and addressing the remaining Pu-238 residues, some of which are intermixed with combustibles in poor containers within gradually degrading plastic bags (site rep weekly 6/2/06).

Los Alamos Neutron Science Center (LANSCE): On Sep 13th, LANL informed NNSA that, pursuant to a DOE General Counsel determination, LANSCE is excluded from the Nuclear Safety Management rule (10 CFR 830) and its PAAA provisions; the Occupational Radiation Protection rule (10 CFR 835) and accelerator order (DOE O 420.2B) apply (site rep weeklies 7/28/06, 9/2/05).

Institutional Safety Programs: On Sep 27th, LANL issued updated requirements for hazardous energy control for worker safety (i.e., lockout/tagout); this was a key open item from the now-closed Operational Efficiency (OE) project; the need for the update has been recognized for years and was highlighted by several recent near-misses. LANL plans to develop relevant training and modify subcontracts by Dec 1st, train workers by Feb 2007, improve hands-on training starting in Mar 2007, and revise facility-specific procedures by Aug 2007 (site rep weeklies 9/15/06, 9/1/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 27, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending October 27, 2006

Waste Operations: Last week, Area G discovered one 55-gal drum and 37 85-gal drums that are unvented; the safety basis requires drums to have filtered vents to prevent flammable gas buildup. Area G has equipment but no authorized process for venting drums and is developing a path forward.

Radioactive Liquid Waste Treatment Facility (RLWTF): RLWTF continues to prepare to replace the leaking caustic waste receipt tank during November. Yesterday, ultrasonic inspection determined that the existing tank's side wall is structurally adequate but that the tank top has indications of weaknesses that may affect load path during lifting. LANL is reviewing the situation.

Chemistry and Metallurgy Research Building (CMR): CMR is continuing fire watches and has proposed a Justification for Continued Operation (JCO) to address wing-to-wing flash-over potential.

LANL's investigation report on the June hood fire indicates that it was due to a spill of a pyrophoric liquid, most likely tri-ethyl aluminum, from a cylinder that originated in TA-21 (DP Site) sometime in the past and was probably moved first to TA-54 and then to CMR; the cylinder's actual history is unknown; it was incorrectly assumed to contain uranium hexafluoride. Causal factors that LANL identified center on control of chemicals and incomplete implementation of integrated work management (IWM) – two longstanding issues at the laboratory (site rep weekly 6/16/06).

Criticality Safety: NNSA's team of criticality safety experts was on site this week to determine the status of the LANL criticality safety program. As of Oct 1st, LANL has walked down and triaged about half the lab's 564 fissile material operations, including all those considered to be high or moderate risk; while walk-downs of the remaining ~300 lower risk operations have slowed, LANL considers that they constitute no serious safety issues. Separately, the NNSA Site Office has assigned a competent individual responsibility for the LANL program and hopes to accelerate his qualification.

The NNSA team's preliminary conclusions are that criticality safety risks here are now well understood and are being well controlled using interim processes, as opposed to the situation a year ago; the strong field presence of LANL experts and the new database of interim criticality safety documentation appear noteworthy; LANL has much to do to establish a compliant program, which could take 2 to 3 years; that said, budgetary decisions made within the last week increase the lab's criticality safety program funding by about 20 % for FY-07, which is encouraging. The NNSA team expects to issue a report in November, and LANL expects to issue an updated schedule for corrective actions in December (site rep weeklies 9/8/06, 8/4/06, 3/10/06, 1/13/06, 12/16/05).

Radiological Facilities: The site rep understands that LANL is considering moving sources from TA-18 to TA-35-2/27 in the near future to support downgrading TA-18 from a Hazard Category 2 (HC-2) nuclear facility. In 2000, TA-35-2/27 was downgraded from HC-2 to a radiological facility by crediting encapsulation for roughly 1 kCi of sealed sources (i.e., 20 times the HC-2 threshold). As discussed in a Board letter (6/26/06), the technical basis for automatically crediting encapsulation to contain nuclear material during a fire is questionable; exacerbating this situation by increasing the inventory without further analysis and controls may be ill-advised (site rep weeklies 2/3/06, 7/29/05).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 3, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 3, 2006

Management: NNSA and LANL have agreed upon and issued a performance evaluation plan, which includes performance based incentives (PBIs) for implementing conduct of operations, engineering, and maintenance, as well as improving the safety bases, criticality safety, and readiness reviews.

Institutional Safety Programs: Last Friday (10/27), LANL forwarded to NNSA new institutional manuals for conduct of operations, maintenance, and engineering in accordance with the PBIs. Implementation plans are expected in January. NNSA intends to review performance quarterly. LANL has also established a conduct of operations performance index, based on occurrence reports and criticality safety infractions, that will serve as a metric for measuring improvement.

Authorization Basis (AB): Last Thursday (10/26), LANL proposed an updated on-site transportation safety document to NNSA. LANL expects to propose updated safety bases for the Plutonium Facility (TA-55) and the transuranic waste repackaging facility (WCRR) today and for the transuranic waste shipping facility (RANT) next week (site rep weekly 8/11/06). Also, NNSA has accepted a LANL re-analysis of the off-site airborne release from postulated accidents at 13 nuclear facilities; the re-analysis used current dispersion methodology and accounted for LANL shrinkage due to land transfers. The changes are within 30 % of previously approved results, except for LANSCE as discussed below.

Plutonium-238 Operations: LANL has concluded that the remaining residues in the room that was contaminated in August 2003 ought to be disposed of as transuranic waste without further processing (e.g., pyrolysis). LANL and the WIPP contractor have also converged on disposal criteria for these residues, as well as other Pu-238 solid wastes, that appear to minimize handling and operator risk while maximizing drum loading (i.e., up to the 80 Ci WIPP limit; site rep weeklies 10/20/06, 6/23/06).

Weapons Engineering Tritium Facility (WETF): WETF has addressed discrepant fire wall penetrations and is close to securing from compensatory measures imposed in August; LANL has also identified a slight overstress condition (5 %) in precast concrete ceiling beams during a fire, but asserts it is acceptable based on the assumed safety factors and the low probability of a fire concurrent with the assumed snow load. WETF is now in the midst of a major ventilation upgrade that includes installing hoods and task exhaust points, improving worker safety (site rep weekly 9/22/06).

Los Alamos Neutron Science Center (LANSCE): The current LANSCE safety basis (2000) predicts unmitigated off-site consequences of 18 rem from a postulated steam reaction with the activated 1L tungsten target; more recent studies indicate that the reaction products would deposit near the target, limiting the airborne release to the outside. In the re-analysis discussed above, LANSCE saw a factor of 5 increase above the current safety basis predictions due to proximity to East Jemez Road. NNSA has requested LANL to expeditiously reevaluate off-site consequences due to LANSCE accidents.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 10, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 10, 2006

Brett Broderick reported for duty here this week as a DNFSB site representative. Merritt and Plaue were also here this week reviewing NNSA and LANL nuclear safety oversight and operations.

Plutonium Facility (TA-55): TA-55 has increased operating tempo and is close to demonstrating a six pit per quarter surge capacity, either this quarter or next. Longer term, LANL intends to accelerate and complete a legacy pit production run by FY-09, then shift to building a Reliable Replacement Warhead (RRW) demonstration unit in 2010 and a first production unit in 2012. The maintenance tempo has also increased for upgrading equipment and is moving to an extended-hour work schedule, likely requiring extended-hour infrastructure support (e.g., site emergency services). Programmatic pressure is increasing on RLWTF receiving transuranic liquid waste by February 2007, on TA-55 processing, repackaging and consolidating residues, on LANL streamlining waste & excess glove-box disposition, and on LANL shipping excess plutonium to Savannah River Site (site rep weekly 8/25/06).

Chemistry and Metallurgy Research Building (CMR): TA-55's pit manufacturing depends on CMR providing analytical chemistry; future use of Wing 9 is also being considered. However, CMR is five-decades-old, and over-sized for the mission; near-term operational cuts are being considered, although CMR is increasingly difficult to maintain; an update to the 1998 safety basis is at least a year away.

In 1998, NNSA accepted the risk of CMR operation to 2010 but the replacement facility (CMRR) is not expected to be operational until 2013 or later. LANL did complete a CMR upgrade project in 2002, but otherwise, there has been little focused study since the 1998 decision of the risks associated with extending CMR operation past 2010; such a study appears warranted to enable risk-informed decision-making among the mission options and the alternatives to continuing CMR operations.

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL expects to replace the leaking caustic waste receipt tank next weekend (11/18) using the existing two lifting lugs. This week, LANL determined that the tank top is structurally sound after removing paint in spots that interfered with previous ultrasonic measurements. LANL intends to inspect, load cycle, and then reinspect the existing lugs and their welds before removing the existing tank. The tank replacement is on schedule, but TA-55's programmatic needs to process a multiple-year residue backlog may drive RLWTF to subsequently treat transuranic waste before RLWTF's deteriorated treatment systems are upgraded.

Federal Oversight: On Oct 1st, the NNSA Site Office (LASO) began their oversight pilot. The week before, an external NNSA team concluded that LASO is prepared to implement the pilot, but it also identified significant gaps; for example, only 4 of the 26 people on the three integrated oversight teams (IOTs) are fully qualified: two facility reps (RLWTF, CMR), one safety analyst, and one project manager; only one IOT team member has unescorted access to TA-55 plutonium operations (PF-4).

Since Oct 1st, pivotal LASO management positions have become vacant, such as the SES Technical Deputy Manager, the Operations Assistant Manager, and the Senior Technical Advisor; several other key positions are temporarily filled. LASO's intent is • to have the Technical Deputy assume the Senior Technical Advisor responsibilities and not fill the latter position; • to compete the other key positions, subject to headquarters approval; • to self-assess the pilot in March; • to prepare for a Chief Defense Nuclear Safety review of the pilot, originally scheduled for January but now proposed for May.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 17, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 17, 2006

Authorization Basis (AB): Within the last two weeks, LANL has proposed to NNSA updated safety bases for TA-55, the transuranic waste repackaging facility (WCRR), and the transuranic waste shipping facility (RANT). Resolution of several of LANL's most significant nuclear safety issues are linked to these submittals (e.g., site rep weeklies 9/1/06, 8/11/06, 6/16/05, 12/9/05, 8/5/05).

Chemistry and Metallurgy Research Building (CMR): NNSA has approved a justification for continued operation (JCO) for potential wing-to-wing flash-over across the spinal corridor during a fire; CMR has secured roving fire watches; LANL has ordered fire doors for affected rooms. Also, on Tuesday, a CMR worker discovered contamination on his right palm, measured at ~11k dpm alpha and believed to be legacy Pu-238; nasal smears were negative; the worker has been decontaminated.

Weapons Engineering Tritium Facility (WETF): This week, NNSA concurred with LANL removing compensatory measures for safety-class fire wall discrepancies; LANL asserts that all fire walls credited in the safety basis have been repaired to a 1 hour rating and meet code requirements.

WETF continues ventilation upgrades and discovered this week that a mis-communication led workers to partially impair the safety-class lightning protection system before low lightning conditions were confirmed, a safety basis requirement. While questions persist on WETF lightning protection's effectiveness as a safety-class defense, adequate control of the human element is still needed to ensure functionality of any safety-class system intended to protect the public. WETF is overdue for a safety basis update and a re-examination of its safety system functional classification, now not expected until late FY-07 (site rep weeklies 11/3/06, 9/22/06; Board letters 8/19/03, 8/6/02).

Plutonium Facility (TA-55): Thursday afternoon (11/16), TA-55 curtailed work in PF-4 and personnel performed an orderly exit after acidic liquid backed up from the closed transuranic acid waste line into two pump rooms and then seeped into three adjacent rooms. As a precaution, LANL emergency response and hazardous material organizations responded. The TA-55 spill response team reentered and determined that the chemical hazard was minimal and the radiological hazard was readily manageable. The spill (estimated at 10 gal) was cleaned up, and normal operations resumed Friday. These small pump rooms are normally controlled as contamination and airborne radioactivity areas; they have a history of radiological and material condition issues that TA-55 is investigating.

Parajito Laboratory (TA-18): LANL has shipped the remaining TA-18 fissile solutions to CMR for disposition. NNSA has also approved a safety basis for storage of Off-site Source Recovery Program (OSRP) sources in a TA-55 transportainer and has approved startup of 3 more trailers (4 total) at the TA-55 secure trailer pad; these actions open the pathway for removing the remaining TA-18 nuclear materials and provide relief to the TA-55 vault, which has been storing TA-18 materials.

The TA-55 transportainer is limited to ~250 Ci, consisting of OSRP sealed sources in pipe-overpack containers meeting WIPP requirements. The trailers are limited to ~3,100 Ci and rely on the trailers, the pads, and external anchorage as safety-class features; containers, shelving, internal anchorage, and the pad slope are safety-significant; material-at-risk and combustible inventory limits are the key admin controls; dispersible Pu (e.g., powders, liquids) is prohibited. Both the transportainer and the trailers will likely be in use for several years (site rep weeklies 10/13/06, 9/22/06, 8/11/06, 7/7/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 24, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 24, 2006

Andersen was here this week attending a CMRR design status meeting.

Fire Protection: Most of the postulated highest-consequence nuclear accidents at LANL involve fire. LANL may not have adequate fire-fighting capability to respond to a nuclear facility fire, particularly if fire fighters are simultaneously responding to a fire elsewhere at the laboratory or the town-site.

The DOE Facility Safety order (DOE O 420.1B) requires DOE sites to implement an acceptable fire protection program with specified features; these include preparing a baseline needs assessment (BNA) that establishes the minimum required site fire-fighting capabilities and updating the BNA at least every 3 years. NNSA and LANL completed a BNA in 2004 that has languished and likely no longer reflects current conditions, such as the expanding TA-55 mission and the new National Security Science Building. The 2004 BNA also did not clearly set the minimum required site fire-fighting capabilities since LANL – possibly uniquely among DOE sites – relies on county fire-fighting resources and the 2004 BNA focuses on mixed needs. NNSA and LANL ought to expeditiously update the BNA and thereby clearly establish LANL's current and future fire-fighting needs (ref: Board letter 5/31/05).

Radioactive Liquid Waste Treatment Facility (RLWTF): Last weekend, LANL smoothly replaced the leaking caustic waste receipt tank and moved it to TA-54 Area G; system restoration has started. The tank developed the leak in September 2003, and its material condition has resulted in numerous safety and programmatic issues (e.g., site rep weeklies 9/19/03, 11/19/04, 4/29/05, 6/10/05, 3/24/06).

After removal, LANL determined that the tank was lighter and more heavily contaminated with Am-241 than expected; this has led to questions on disposition and on adequacy of the transportation procedures used. Other than that, this operation appears to have been well planned and well executed due to increased formality of operations and management attention applied during the last 18 months.

Plutonium Facility (TA-55): On Tuesday (11/21), a new spring-loaded sample holder ejected a small piece of plutonium metal from a hood that then bounced off a worker's anti-Cs and fell to the floor; the three workers in the room evacuated; the continuous airborne monitor alarmed; one worker had positive nasal smears, indicating a potential uptake; bioassay of affected workers is underway.

It appears that the new sample holder did not receive adequate scrutiny as a new potential hazard before being placed in use, which raises questions about work planning, authorization, and readiness determination. This operation is also incompletely described in the applicable safety basis process hazard analysis. TA-55 plans to conduct cold testing of the new sample holder before resuming the operation.

Quality Assurance: The NNSA Site Office discovered this week that LANL has issued and is implementing a new Quality Assurance Plan (QAP) in advance of NNSA approval. The Nuclear Safety Management rule (10 CFR 830) requires the QAP receive federal approval; NNSA Site Office review is underway. The proposed QAP, submitted on Sep 8th, reflects the LANS organization and is intended to incorporate requirements from the latest DOE Quality Assurance order (DOE O 414.1C).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 1, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 1, 2006

The Board and a staff team were here this week reviewing LANL activities.

Management Systems: Both the LANL contractor assurance system (CAS) and the NNSA Site Office (LASO) oversight pilot began on Oct 1st. Maturity of both is low and not expected for 2 to 3 years; NNSA is highly dependent on CAS being transparent and providing the necessary feedback to support sound decisions and ensure safe operations. LASO nuclear safety oversight is also limited by key management vacancies and insufficiently trained and qualified staff; LASO intends to have qualified facility reps in all the nuclear facilities by mid-2007 (site rep weeklies 11/10/06, 10/6/06).

Institutional Safety Programs: LANL safety programs, such as integrated work management (IWM), have persistent weaknesses. In recent weeks, LANL issued an integrated formality of operations plan to improve four key programs – operations, engineering, maintenance, and training. In January, LANL intends to issue facility-specific implementation plans for these, as well as a lab-wide improvement plan for IWM. LANL expects the improved IWM process to be implemented by September 2007.

Authorization Bases (ABs): LANL has had difficulties updating ABs, selecting viable controls, demonstrably implementing controls, and consistently analyzing accidents to support risk-informed decision making. LANL has committed to updating all the nuclear facility safety bases in FY-07, except CMR, which is planned for FY-08. LANL has also issued a safety basis improvement plan that emphasizes selection and implementation of demonstrably viable operational and engineered controls.

Transuranic Waste Operations: Area G risk is dominated by ~320 high-activity drums that collectively contain about 50 kCi, which is about third of the current above-ground TRU waste inventory; there are another ~300 high-activity drums below ground with about 90 kCi that LANL intends to start retrieving next year. LANL has proposed new safety bases for the key facilities needed to process and ship the above-ground high-activity drums to WIPP; however, at this point, NNSA and LANL still lack a common understanding and acceptance of the risk tradeoffs involved.

Plutonium Facility (TA-55): TA-55, so far, is on track to meet FY-07 commitments, but LANL staffing and infrastructure, both within and outside TA-55, can not clearly support and sustain the increasing tempo; LANL recognizes the needs for integrated planning and scheduling, which is underway. Pu-238 operations also receive much less support than weapons plutonium operations, although the former dominates TA-55's risk profile. For example, the Pu-238 residues in the room contaminated in August 2003 pose about a quarter of the risk due to TA-55 packaged materials. LANL has committed to addressing these residues by mid-2007, which is positive; however, NNSA and LANL have delinquent institutional commitments from that event, indicating a loss of priority.

Chemistry and Metallurgy Research Building (CMR): NNSA and LANL have not evaluated the risks associated with continued CMR operation past 2010, even though they expect the CMR replacement facility (CMRR) will not be operational until 2013 or later (site rep weekly 11/10/06). LANL is now starting to evaluate the safety implications of post-2010 operations, as well as pursue shifting people and operations out of the three most vulnerable wings during the next two years.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 8, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 8, 2006

Transuranic (TRU) Waste Operations: In discussions with LANL this week, NNSA management communicated that they are inclined to reject the proposed safety bases for two key facilities needed to process and ship about 300 high-activity TRU waste drums to WIPP. Based on their partially completed reviews, the NNSA review teams believe that the proposed safety bases over-rely on specific administrative controls over engineered systems and have quality issues, such as low specificity of functional requirements for the few declared engineered safety systems. The site reps observe that the issues seem to arise less from document quality and more from a lack of shared understanding and agreement of the risk tradeoffs involved in key safety basis decisions.

Unmitigated Risk Perspective: Several of LANL's highest-consequence postulated nuclear accident scenarios involve TRU waste stored at Area G. The Area G safety basis that NNSA approved in 2003 posits about three dozen accident scenarios that have unmitigated offsite consequences ranging from 1 to 1,800 rem (CEDE); predicted offsite consequences for about half the scenarios exceed 100 rem.

Several high-consequence scenarios involve about 300 high-activity drums (greater than 56 Ci) that lack an approved disposition pathway; these drums constitute about 2 % by number but about a third by activity of the total above-ground inventory (i.e., 50 kCi of 150 kCi). Without mitigation, small fires or spills involving small numbers of these high-activity drums lead to predicted off-site consequences of about 100 rem or greater. The general population of drums (~ 4 Ci average) can also induce high offsite consequences but only during less-probable large fires or a major earthquake.

LANL has proposed safety bases for processing the high-activity drums in the WCRR facility and shipping them from the RANT facility, thereby opening a disposition pathway that eliminates the risks associated with these high-activity drums. This would require NNSA to accept operations involving an order-of-magnitude more activity in these facilities than previously accepted, but only for the time required to process and ship 2 % of the drums. Without mitigation, large fires or a major earthquake involving these facilities with these inventories are postulated to cause building collapse and result in high offsite consequences (i.e., 50 rem for WCRR, 500 rem for RANT, compared to 1,000 rem for Area G); this corresponds to about 20 % higher risk from WCRR and RANT operations, but it supports achieving a significantly greater risk reduction in Area G for a broad range of accident types.

Mitigation Perspective: Area G has few creditable safety-class engineered systems, mainly just the containers; it is an extrapolation to assert that these systems will provide the two or three orders of magnitude of mitigation necessary to address the postulated accident scenarios. NNSA observed in 2003 that, given the lack of safety systems, removal of material-at-risk is the only way of reducing the potential offsite consequences; therefore, NNSA imposed a requirement to ship about 2,000 higher-activity drums by Sep 2004. This stalled due to a lack of an approved pathway that persists today.

Similar to Area G, WCRR and RANT have few creditable high-pedigree engineered systems that address fire and seismic scenarios. In August, LANL proposed a strategy that involves high reliance on compensating administrative controls; the key strategic assumption was that NNSA could accept short-term increased risk in WCRR and RANT to achieve a much greater and timely risk reduction in Area G. Since Nov 3rd, NNSA has been reviewing the proposed safety bases from a context appropriate for continuous, long-term operations, as opposed to one considering relative risks; this has created conditions for rejection rather than for continued engagement supporting timely resolution of issues.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 15, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: B. Broderick and C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending December 15, 2006

Transuranic (TRU) Waste Operations: NNSA has terminated reviews of the proposed safety bases for two key facilities needed to process and ship high-activity TRU waste drums to WIPP. NNSA has committed to provide LANL rough sets of representative comments from the curtailed reviews and to deploy a two-person team to liaison between NNSA and LANL during the document revision process.

In parallel with the safety basis revisions, LANL is completing engineering work packages for natural gas line removal and for fire suppression and seismic/structural upgrades in one of the key facilities – the WCRR repackaging facility. The site reps understand that these modifications are intended to align the systems with their descriptions in the safety basis revision; the modifications appear relatively small in scope but large in benefit in improving the facility's safety posture. For example, the structural modifications, which may start and complete next month, increase assurance that the building meets performance category 1 (PC-1) and possibly even PC-2 requirements; this is positive.

There may be other such opportunities, but as discussed last week, there are risks associated with continuing delay. It is advisable for NNSA and LANL to quickly but deliberately examine the suite of available safety systems for these two facilities, aggressively pursue straight-forward high-benefit upgrades, and equally aggressively pursue reaching agreement on compensating administrative controls when no straight-forward upgrade exists.

Recommendation 04-2: LANL has completed its evaluation of the TA-55 PF-4 confinement ventilation system; it included a cost-benefit analysis of 11 potential backfit options that could improve building confinement during bounding fire and seismic accident scenarios; NNSA site office action on the evaluation is pending (site rep weeklies 9/22/06, 9/1/06, 12/9/05).

The study asserts that upgrading confinement ventilation to safety-class would be costly and would be insufficient to mitigate all accidents considered, particularly a seismically-induced fire. While several options potentially address all the scenarios, a combination of two options—glovebox seismic support upgrades already planned (\$20M) and ventilation bleedoff subsystem modifications (\$5M)—was identified as the most cost-effective; the bleedoff subsystem modifications would focus on providing safety-significant active confinement during fires. The study concluded that this combination would drive mitigated consequences for most accidents to 0.1 rem CEDE or below and would reduce the mitigated consequence for a seismically-induced fire from about 174 to 15 rem CEDE.

Plutonium Facility (TA-55): Weaknesses in the TA-55 electrical distribution system leave the facility vulnerable to power loss from even minor grid transients. Nineteen transient events have impacted the facility over the past six months, ten of which led to significant operational interruptions. These events cause unplanned interruption of hazardous work; they adversely affect the operability of facility safety systems, particularly confinement ventilation; and while the transient lasts milliseconds, orderly recovery typically takes about 2 hours. Near-term, the facility is pursuing installation of a power conditioner and/or capacitor bank to reduce sensitivity to short duration transients. Longer-term, planned switchgear upgrades are intended to automatically transfer key loads to a backup diesel generator when offsite power is interrupted or lost (site rep weeklies 10/13/06, 4/2/04).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 22, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 22, 2006

Andersen, Hadjian, and Kimball were here Monday to attend a review of the site-wide probabilistic seismic hazard analysis (PSHA) update. LANL was closed on Wednesday due to snow.

Seismic Criteria: The LANL PSHA update has slipped and is now projected to be done next month. When completed, the seismic design loads are expected to increase over those that have been used since 1996; for example, Performance Category 3 (PC-3) peak ground acceleration tentatively increases by about 50 % – from 0.34 g to 0.52 g. The Chemistry and Metallurgy Research Building Replacement (CMRR) Project anticipated the increase and has been using consistent higher design loads since July (site rep weekly 7/21/06). The impact on existing facilities remains to be determined.

Criticality Safety: On Thursday (12/21), NNSA approved LANL's proposed updated criticality safety program improvement plan, which is intended to address issues from NNSA's Oct 2005 assessment during the next 3 years. LANL asserts that the 3 year time frame is acceptable because the laboratory has established that adequate safety margin exists and that an interim configuration management protocol is in place. NNSA is also still finalizing a report from their Oct 2006 assessment, which preliminarily concluded that criticality safety risks here are now well understood and are being well controlled using interim processes, as opposed to the situation a year ago (site rep weekly 10/27/06).

The LANL plan discusses accomplishments to date, including issuing an institutional policy and manual, reviewing 564 fissile material operations, and walking down most of the operations; the remaining 'low risk' operations are scheduled to be walked down by Mar 2007, about 3 months later than the original schedule. The next phase focuses on bringing practices and documentation into compliance with the new policy and manual. The scope is large but risk-prioritized; the largest part involves generating more than 110 new criticality safety evaluations (CSEs) for current operations that are missing CSEs, upgrading more than 50 technically deficient CSEs, and correcting roughly 170 CSEs that have other issues. LANL is planning staff augmentation in FY-07 to support this.

Chemistry and Metallurgy Research Building (CMR): CMR has a Cm-244 source in Wing 9 floor hole storage that has an order of magnitude more activity than that in the rest of CMR combined. The CMR safety basis (1998) assumes floor storage is robust and therefore excludes this source from material-at-risk (MAR) controls; if the MAR controls applied, the source would exceed the facility limit by an order of magnitude. A shielded cask is available to support disposition but cannot be used due to unresolved floor loading issues linked to a longstanding potential inadequacy in safety analysis (PISA). Prudence dictates timely action given the source's size and CMR's age-related issues.

Software Quality Assurance: A LANL investigation determined that ineffective implementation of the institutional software quality assurance (SQA) program was a shared root cause in three recent reportable occurrences. These events included 2 MAR limit violations at TA-54 Area L and the introduction of a prohibited item at the TA-3 Nonproliferation and International Security Center; each event involved deficiencies in safety-related software. To address institutional issues, LANL is revising SQA policies and procedures and requiring new division-level implementation plans to drive compliance. The investigation report also recommended the identification of a single MAR-tracking software program to replace the four separate systems currently in use across the laboratory.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 29, 2006

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 29, 2006

The laboratory was closed and Broderick was off-site this week. Normal operations resume Jan 2nd.

Plutonium Facility (TA-55): On Dec 13th, several people were taken to LANL occupational medicine and one person was taken to the Los Alamos Medical Center because they had pre-existing respiratory conditions that could be aggravated by the chemical used for HEPA filter testing, done the previous evening. The chemical (dioctyl sebacate, DOS) has been used for such testing for a decade; it is similar to mineral oil and, while mildly irritating, has not been considered a health risk. TA-55 is pursuing increased employee notification before testing and potential changes to the tests to aerosolize less DOS.

Nuclear Material Stabilization: LANL has reported that about 630 kg of plutonium (Pu) have been stabilized since mid-2004 by repackaging for interim storage or disposal; LANL has thereby met 3 commitments due this month for stabilizing half of its Pu within the scope of the Secretary's 00-1 implementation plan (ref: DOE letter 7/23/04). The site reps observe: • while repackaging improves the safety posture, eventually much of this Pu will need to be chemically stabilized and repackaged again; • LANL still lacks large vessel clean-out capability; • LANL still lacks a comprehensive site-wide nuclear material packaging and storage plan – a key element described in the 00-1 implementation plan for LANL addressing its current large Pu residue backlog (site rep weekly 8/25/06).

Authorization Basis: NNSA has approved with comments LANL's 3-year safety basis improvement plan. The plan involves developing 10 CFR 830 compliant safety bases for all the nuclear facilities (except possibly CMR) during the first year, and then implementing the annual update requirement for nuclear facilities and completing hazard categorization of other hazardous facilities during the next two years. NNSA comments involved assumptions, project risk planning, and inventory control in less hazardous facilities. The plan emphasizes the linkage between safety basis and engineering and thereby could increase assurance that designated safety systems will demonstrably and reliably perform their safety function – a longstanding issue (ref: Board letter 1/27/04, site rep weekly 8/11/06).

Readiness Assessments: LANL conducts roughly two dozen reviews each year to confirm readiness for startup of new or modified nuclear operations and to verify implementation of new safety basis requirements. The LANL reviews have been inconsistent in quality and effectiveness; most issues arise from misunderstandings of the review's purpose, insufficient preparation, and premature declaration of readiness (e.g. site rep weekly 7/22/05). There have been few comparable federal reviews during the last five years, and to the site reps' knowledge, there were no such federal reviews in 2006.

In November, LANL issued a readiness review improvement plan to be completed during the next few months. Key elements include using separate processes for assessing startup readiness and safety basis implementation (already implemented and similar to that used at other sites, site rep weekly 2/10/06); strengthening the management self-assessment (MSA) process; improving training of readiness coordinators and other involved personnel; improving planning and scheduling; and improving coordination with the NNSA site office.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 5, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 5, 2007

Federal Oversight: An NNSA Chief Defense Nuclear Safety (CDNS) team is on site next week to examine the NNSA Site Office oversight pilot and the Contractor Assurance System (CAS) interface.

Pajarito Laboratory (TA-18): This Spring, LANL plans to propose downgrading TA-18 from a Hazard Category 2 (HC-2) nuclear facility to a radiological facility, based on segmentation of the remaining radioactive inventory. Specifically, 3 transportainers will be used to store large pieces of natural and depleted uranium that are packaged for shipment to the Nevada Test Site; they would constitute 3 segments; the remainder of TA-18 would constitute a fourth segment. TA-18 would then be managed in a surveillance and maintenance mode until disposition plans are finalized.

Chemistry and Metallurgy Research Facility Replacement (CMRR) Project: The LANL subcontractor responsible for the design and construction of the Radiological Laboratory and Utility Office Building (RLUOB) submitted the final design to LANL on January 2nd; LANL intends to complete its review of the package this month and expects to approve it, following comment resolution, by mid-March. The RLUOB, a radiological facility limited to about 0.5 Ci inventory, is expected to have about 19,500 ft² of laboratory space, provide offices for 350 personnel, and contain a consolidated training facility and incident response center. Project management is briefing NNSA headquarters next week on the status and direction for the separate CMRR HC-2 nuclear facility.

Transuranic (TRU) Waste Operations: Area G currently has about 20,000 TRU waste containers with 131 kCi above ground (including ~15 kCi OSRP sources); there is a comparable inventory below ground, plus TA-55 waste receipts, that are currently all within the scope of the Area G closure effort.

The 2003 Area G safety basis identifies about 3 dozen postulated accident scenarios with unmitigated off-site consequences ranging from 1 to 1,800 Rem CEDE. A third of these scenarios involve small numbers of high-activity drums that currently have no approved disposition path (site rep weekly 12/8/06). The remainder involve large numbers of drums of average activity; the average activity has been increasing with time and now stands at about 6 Ci/drum. LANL expects to reassess the risks and submit an updated Area G safety basis to NNSA in the coming months.

Area G has few creditable engineered safety features; therefore, to reduce risk, NNSA advocated in 2003 expeditiously shipping higher-activity drums to WIPP. Since then, LANL has shipped about 5,300 drums (22 kCi), predominately with average activity; about 3,000 drums (18 kCi) were shipped last year; Area G has also continued to receive 300 or more drums per year from TA-55. The rate-limiting steps are repackaging drums to remove WIPP prohibited items and shipping drums; both are running at roughly 200 drums per month. There were short periods during the last year, when LANL was able to repack and ship waste at rates twice or more the average; however, these were not sustainable.

At current rates, these risks will persist for many years. Assuming the drum rejection, certification, and shipping rates experienced during the last 15 months, it will take roughly 8 years to certify and ship the current aboveground inventory (i.e., 2015) and another 8 years to address the belowground and TA-55 waste inventories (i.e., 2023). Improving on the rates will require a shared understanding of the risks, more appropriate prioritization, and a more concerted effort by the principal parties – NNSA, DOE-Environmental Management, LANL, and the WIPP contractor – than applied in the past.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 12, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 12, 2007

Federal Management and Oversight: NNSA announced this week the temporary assignment of a new Los Alamos Site Office (LASO) Manager, effective Feb 5th; he will be the sixth LASO Manager assigned since the site rep office was established here in August 2001. NNSA management continues to fully support the two-year LASO oversight pilot, which has challenges (site rep weekly 11/10/06).

The NNSA Chief of Defense Nuclear Safety (CDNS) team on site this week split their efforts between waste operations, as discussed below, and an examination of the pilot. The pilot's current state and key challenges appear well understood; management acknowledged that additional technical resources are expeditiously required for the pilot's success. The CDNS biennial review is scheduled for May.

Criticality Safety: There are inconsistencies between the LANL institutional criticality safety manual (ISD 130), issued last July, and a general TA-55 administrative procedure for nuclear criticality safety, revised last October; LASO and LANL acknowledge the latter needs to be improved. In a larger sense, LASO and LANL have agreed upon a plan to improve LANL's criticality safety program during the next 3 years (site rep weekly 12/22/06). Accelerating reestablishment of an active Nuclear Criticality Safety Committee to provide semi-independent institutional oversight would be helpful.

Transuranic Waste Operations: Last month, NNSA and LANL stalled on developing a path forward for the high-activity drums, disposition of which is funded by DOE-EM (site rep weekly 12/8/06). Last week, NNSA management directed CDNS to examine the risks and viability of starting to disposition these drums within weeks, in response to budgetary pressure from DOE-EM.

This week's CDNS review concluded that this is viable. Subject to headquarters agreement, CDNS will lead the effort and will pursue jointly with LASO and LANL a notional path-forward that involves developing a resource-loaded project plan by the end of January, developing a safety basis in February, completing limited facility improvements in March, completing procedures, training, and a joint federal-contractor readiness assessment in April – to support startup by end of April.

Notionally, the safety basis would consist of the draft documents submitted two months ago, a set of additional conditions and controls, and an ad-hoc list of other documents describing safety program and system enhancements, all captured in an authorization agreement. Since this safety basis and the joint readiness assessment are not consistent with DOE rules and orders, CDNS plans to process exemption requests to the Nuclear Safety Management rule (10 CFR 830) and the DOE startup order (DOE O 425.1C). Separately, LASO and LANL would develop 10 CFR 830 compliant safety bases for the affected facilities that would be reviewed, approved, and implemented after the April startup.

Chemistry and Metallurgy Research Building (CMR): On Monday (1/8), an operator sustained a puncture wound while performing glovebox operations in CMR. This event appears to be prompting a reexamination of the hand tools used in CMR gloveboxes and the controls and PPE implemented to provide worker protection. A systematic review could enhance safety and help prevent recurrence.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 19, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 19, 2007

Deplitch and Goff were on site this week to observe a criticality assembly control system design review.

Operations: While core activities such as pit manufacturing are meeting targets, support operations and safety programs are increasingly strained to meet commitments within budget. For example: • extended-hour operations at the Plutonium Facility (TA-55) are now the rule rather than the exception but are not clearly supportable by institutional services, such as emergency response; • management has appropriately increased focus on reducing Area G transuranic waste inventory – e.g., extended-shift waste repackaging started this week in WCRR – but management has reduced focus on receiving TA-55 waste; as a result, TA-55 is accumulating waste and may need to slow down Pu-238 residue disposition, one of TA-55's most important risk reduction activities; • TA-55 is accumulating solutions that the Radioactive Liquid Waste Treatment Facility may need to process before upgrading its deteriorated systems; the alternative, retention in TA-55, also has issues; • unvented drums found in Area G in October still lack a path-forward; • several nuclear facilities have shortages in system engineers; • maintenance and worker qualification databases are marginally supported; • the institutional training program is underfunded and unlikely to make substantial progress this year on correcting longstanding training issues that were a contributing cause for the LANL 2004 stand-down.

Chemistry and Metallurgy Research Building (CMR): CMR is an example of conditions described above. To support pit manufacturing, CMR worked extended hours this week to recover from an analysis backlog caused by infrastructure issues that impacted programmatic equipment. The CMR operational staff has been cut by 16 % since October; losses include systems engineers (now at a quarter of estimated need), work planners, radcon technicians, waste services, and maintenance crafts. On the present course, CMR may need to begin to secure some operations in response to random equipment failures within weeks or months. This run-to-failure approach for CMR has been considered before and rejected; deliberate well-planned reduction of operational footprint is preferred. LANL has recently identified a need to extend CMR lifetime notionally to 2016; sharply reducing facility maintenance now is inconsistent with lifetime extension (site rep weekly 12/1/06).

Contaminated Wounds: Two events have occurred: • LANL has launched an investigation into the CMR puncture wound reported last week; it is to be completed by Feb 20th; NNSA is considering the need for a federal Type B investigation, per DOE Order 225.1A, *Accident Investigations*; CMR has taken actions to control the scene and to address already apparent problems. • On Wednesday (1/17), a TA-55 pit machinist was scratched and became contaminated while working in a glovebox; the wound count is positive; TA-55 has curtailed pit manufacturing work and is reviewing operations. CMR and TA-55 are also re-examining their glovebox glove integrity programs, which have weaknesses but are a key component in several facilities (e.g., WCRR) for worker radiological safety.

Criticality Safety: On Wednesday, a TA-55 worker reported a 20 % over-mass condition on a shelf of a cart. The room was secured; the condition was evaluated and corrected per LANL procedures. LANL's review of the event found problems with postings and with operator interpretation of which had over-riding precedent: the room posting or the cart posting. Underlying these problems are weaknesses in operator training and in implementing the Criticality Safety Officer program; these are focus areas for the criticality safety program improvement efforts (site rep weekly 12/22/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 26, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: Chuck Keilers and Brett Broderick, LANL Site Representative
SUBJECT: Activity Report for Week Ending January 26, 2007

The site representatives were at DNFSB-headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 2, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 2, 2007

Keilers was off-site this week.

Contaminated Injury Investigation: A laboratory sponsored Type B-like investigation into two recent contaminated wound incidents began this week (site rep weeklies 1/19/07, 1/12/07). The Associate Director for Nuclear and High Hazard Operations is leading the eight-person investigation team that includes four participants from LANS corporate parent organizations, including Washington Group International and BWX Technologies. During the initial interview phase, the team is split, with one half investigating the Chemistry and Metallurgy Research Facility event and the other half, the Plutonium Facility event. A draft report and findings are scheduled to be presented to lab management on 2/23/07.

Formality of Operations: The conduct of operations, engineering, and maintenance components of the Formality of Operations project have moved from the development to execution phase. Last week, LANL management approved implementation plans designed to close gaps between the new institutional manuals and the existing policies and procedures. Facility Operations Directors (FOD) are now responsible for executing these plans, which should serve to standardize and improve performance lab-wide. Progress will be assessed quarterly and tied to contractual performance based incentives. Conduct of training is the fourth element of the Formality of Operations initiative and is critical for enabling and sustaining success in the other areas. The training manual was issued this week, and FODs will perform gap analyses and revise implementation plans accordingly.

The need for timely, effective implementation of Formality of Operations is underscored by the events that prompted the investigation discussed above and warrants continued close management attention.

Transuranic (TRU) Waste Operations: The Chief of Defense Nuclear Safety (CDNS) was on-site this week to finalize the Project Management Plan for dispositioning 229 high-activity transuranic waste drums stored above ground at Area G (site rep weeklies 1/12/07, 12/15/06, 12/8/06). The plan targets approval to begin repackaging high-activity drums in the Waste Characterization, Reduction, and Repackaging (WCRR) facility on Apr 30th; the short (3-month) WCRR preparation phase drives the need for an exemption-based safety basis and readiness review strategy. To meet the Apr 30th target date, LANL is revising the existing draft safety basis for WCRR, with input from LASO and CDNS, and plans to reissue it later this month. The Project Management Plan assumes that a safety evaluation report approving the safety basis cannot be prepared in this period, so an exemption to the DOE readiness review order (O 425.1C) will be proposed. A LANL Readiness Assessment and NNSA Operational Readiness Review are then planned for April; assuming readiness is demonstrated, an exemption to the Nuclear Safety Management rule (10CFR830) will also be proposed to allow startup of Hazard Category 2 nuclear facility operations without an approved rule-compliant safety basis. NNSA HQ (NA-10) will serve as the Authorizing Authority for the exemption requests and facility startup.

The Project Management Plan's scope excludes 5 above-ground drums with activity greater than 300 PE-Ci that contain combustible debris and 60 sludge drums that cannot currently be processed in WCRR. These drums will be addressed in a later campaign to disposition underground high-activity waste.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 9, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 9, 2007

NNSA, LANL, and the staff held a video-teleconference on the CMRR Project on Wednesday.

Federal Management: A temporary NNSA site office manager, technical deputy manager, and senior safety advisor arrived this week and are expected to be on-station for 4 to 6 months until permanent assignments are made. These are key federal positions that strongly influence LANL nuclear safety.

Transuranic (TRU) Waste Operations: The quantity of material-at-risk (MAR) is a key assumption in accident analyses and is usually a key control for ensuring that a facility's operating state is within the bounds assumed in the analyses. LANL TRU waste facilities control MAR based on the waste generator's data, which is the best data available but often has large measurement uncertainties. In a recent case, the WCRR repackaging facility removed a WIPP-prohibited item from a drum that was initially believed to contain 48 % of the WCRR MAR limit (56 Ci), based on generator data, but later determined to exceed the WCRR MAR limit by 12 %, based on WIPP certification data – an increase by a factor of 2.3. LANL analysis of ~6,500 drums shows that the WIPP certification data averages about 30 % higher than the generator data and can be much greater for individual cases. NNSA and LANL are considering the implications on accident analyses and control selection.

Plutonium Facility (TA-55): The Plutonium Facility has resumed more than 90% of glovebox operations after standing down in mid-January in response to a contaminated injury that punctuated a string of less-severe glove breaches (see site rep weekly 1/19/07). TA-55 management took actions to identify and address worker safety issues associated with glovebox work and instituted a deliberate process for resuming operations. These actions included mandatory use of more puncture-resistant inner gloves; execution of formal walkdowns to identify and eliminate or otherwise better control hazards; temporary use of an independent safety observer for certain operations with a higher potential of injury; and plans for periodic walkdowns for certain operations deemed to have high potential risk.

Radioactive Liquid Waste Treatment Facility (RLWTF) Replacement Project: LANL plans to replace the existing RLWTF with a new facility by 2011. NNSA approved proceeding with a single Hazard Category 2 nuclear facility in June 2006, as part of Critical Decision 1. Based on expected life cycle cost savings, LANL subsequently proposed a new multiple-facility approach, in which TRU operations would be housed in a dedicated processing facility and an influent vault, as nuclear facilities, and low level waste operations would be conducted in a separate radiological facility.

NNSA asserts that the best course is to proceed with the original single-facility concept. The NNSA position is that the potential life cycle cost savings are not compelling enough to justify the programmatic risks unless certain actions are taken to mitigate these risks. NNSA is allowing LANL to pursue the multiple-facility concept, provided LANL meets several conditions, including planning on reducing the TA-55 liquid TRU waste stream and factoring this into the new RLWTF design. A LANL response detailing their path forward is due by Feb 15th.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 16, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 16, 2007

Anderson, Matteucci, Plaue, and Shuffler were on site this week reviewing TA-55 aqueous operations.

Contract Modification: On Jan 25th, NNSA and LANL added the updated DOE orders for emergency management (DOE O151.1C, 11/2/05) and facility safety (DOE O420.1B, 12/22/05) to the contract.

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL has completed installation of the new caustic waste receipt tank and expects to complete system testing and begin receiving TA-55 transuranic liquid waste starting next week. LANL also now intends to propose that RLWTF process its transuranic waste inventory in May before starting to upgrade its deteriorated systems; this would increase TA-55's ability to process residues before RLWTF completes its first phase of upgrades. Last year, after a multi-year hiatus, RLWTF ran a transuranic waste campaign using the existing systems and a rigorous contingency planning and startup process (site rep weeklies 11/24/06, 8/11/06).

Electrical Safety: In recent weeks, LANL has had several electrical safety related events. A programmatic 208-volt lathe in a nuclear facility was damaged upon startup because it was wired to 480-volts. The ground wire shorted in a field-installed-plug for a programmatic laser in a nuclear facility, causing an arc. The 480-volt bus entering a non-nuclear facility overheated, causing a burning odor, due to improper installation by a subcontractor. Another subcontractor was working on an energized 480-volt panel with proper protective equipment but without an integrated work document.

In each case, appropriate recovery actions were taken, including stop work, and no injuries resulted. For these events, the causes are well understood and could be addressed by previously identified corrective actions. Near term, the LANL Chief Electrical Safety Officer (ESO) has recommended that facility ESOs take suspect and unapproved electrical equipment out of service until inspected. Longer term, LANL intends to issue and implement new lab-wide requirements for electrical equipment and for subcontractor management, as well as pursue the conduct of engineering initiative.

Issue Management: LANL is late on many of the corrective actions from the June 2006 RLWTF construction accident and has not yet systematically developed corrective actions for the June 2006 CMR hood fire (site rep weekly 10/20/06). LANL also appears to be falling behind on issuing Price Anderson (PAAA) noncompliance reports; three were issued this week for the longstanding non-compliant quality assurance program and for emergency management and fire suppression issues identified before June 2006. NNSA has established a performance based incentive involving corrective actions; however, other than occasional facility rep involvement, NNSA does not appear to be actively monitoring and advocating progress on corrective actions.

The LANL Institutional Management Review Board is exercising formal change control on lab-wide corrective actions (e.g., scope, schedule) and is learning from these experiences and improving its processes; this is a key element of the evolving contractor assurance system (CAS). The accident investigation for the CMR and TA-55 contaminated puncture wounds is expected to be done by Feb 26th and will provide LANL an opportunity to demonstrate improvement (site rep weekly 2/2/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 23, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 23, 2007

T. Davis was here this week augmenting site rep coverage.

Transuranic (TRU) Waste Operations: The Chief of Defense Nuclear Safety was on-site this week, working with LANL and local NNSA personnel on the development of a safety basis for repackaging high-activity drums under a temporary exemption to the nuclear safety management rule (10 CFR 830). LANL's objective is that this safety basis would be compliant, only lacking a federal safety evaluation report, which NNSA and LANL expect will follow at a later date (site rep weekly 2/2/07).

Radioactive Liquid Waste Treatment Facility (RLWTF): RLWTF is close to receiving its first transfer of TRU liquid waste from TA-55 to the new caustic tank; this is the first of several milestones toward LANL re-establishing reliable TRU liquid waste processing capability.

Unvented TRU Waste Drums: Last October, Area G discovered about three-dozen drums that are unvented, a condition which violates the Area G safety basis since it could result in flammable gas buildup (site rep weekly 10/27/06). LANL segregated the drums. This week, LANL had a hazardous material response team confirm that the segregation was adequate and that the drums are not showing indications of pressure buildup. Area G has equipment but no authorized process for drum venting.

While NNSA and LANL waste management have been fully occupied with addressing the Area G high-activity drums and restoring RLWTF receipt capability, it has been four months since the unvented drums were identified; this seems an inordinately long period without a formal contractor analysis of the risk and the adequacy of interim controls and a formal federal risk acceptance. LANL is close to submitting to NNSA a justification for continued operation for the unvented drums.

Decontamination and Volume Reduction System (DVRS) Facility: LANL lacks capability to size reduce and disposition roughly 650 oversized TRU waste items that are either stored now at Area G or expected to be generated by 2010, mainly from TA-55; many of the existing items are in fiberglass reinforced plywood boxes. Recently, facility management barred receipt of newly generated oversized items because of the lack of a disposition path and commitments made to complete TRU waste shipments from Area G by 2010. This mainly impacts TA-55's efforts to remove large excess contaminated items (e.g., gloveboxes, pencil tanks) and thereby make space for TA-55 modernization.

To reconstitute this capability, LANL plans to restart the DVRS in May for a 4-month campaign as a radiological facility and then to upgrade DVRS and start it up as a Hazard Category 3 nuclear facility in Feb 2008. DVRS started up in 2002 as a radiological facility for this purpose. In 2004, LANL curtailed DVRS operations due to lack of funding. In 2005, LANL modified DVRS by installing a glovebox that was intended to be used for a five-month campaign to repackage high-activity drums; this campaign never started. More recently, the DVRS glovebox was reconsidered for repackaging high-activity drums but was not selected. LANL intends to remove the DVRS glovebox within a few months as a prerequisite for restoring large-item size reduction capability (site rep weeklies 11/10/06, 6/30/06, 9/19/03, 8/23/02).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 2, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 2, 2007

Broderick was off-site this week.

Price Anderson Enforcement Letter: NNSA has sent the former LANL contractor (UC) a preliminary notice of violation for the March 2005 Pu uptakes, the July 2005 Am-241 contamination event, and the Oct 2005 DOE-OA review findings (site rep weeklies 2/3/06, 1/27/06, 4/29/05). In May 2006, LANL (UC) issued an integrated corrective action plan (ICAP) to address related needs involving integrated work management; behavior based safety; oversight and assessment processes; radiological protection; safety basis; conduct of engineering; vital safety systems; and configuration management. The new LANL contractor (LANS) updated and committed to the ICAP in Sep 2006.

The site reps understand that LANL has embedded the ICAP corrective actions in the new issue management system (LIMITS), which is part of the contractor assurance system (CAS); however, LANL management does not appear to have an explicit mechanism in place for closely monitoring ICAP progress and quickly focusing attention on lagging elements of the ICAP when they arise.

Nuclear Infrastructure: LANL has a fiscally-driven imbalance between TA-55's needs to send and TA-54's ability to receive, certify, and ship transuranic (TRU) waste; this has mission and safety implications (site rep weekly 8/25/06). TA-55 has a significant backlog of plutonium residues that either need to be processed by TA-55 or shipped via TA-54 to WIPP for disposal. On several occasions, the Board has advocated disposal (e.g., Board ltr 11/21/01), and TA-55 has increasingly pursued disposal, particularly for higher-risk residues (e.g., Pu-238). However, TA-54 has its own challenges, such as a consent order commitment to close Area G by 2015; this requires shipping the aboveground and retrievable belowground TRU waste inventory to WIPP within the next 3 to 5 years. As of mid-2006, this inventory stood at about 300 kCi in about 43,000 drum-volume-equivalents.

To relieve the bottleneck, an alternate course under discussion involves TA-55 establishing interim capability to certify and ship newly generated TRU waste to WIPP in near-real-time, thereby decoupling TA-55 from TA-54 while avoiding a waste buildup in TA-55. Although initial investment would be needed, this course could expedite both TA-54 de-inventory and TA-55 residue disposition, leading to earlier risk reduction and enhanced mission performance for both operations.

Chemistry and Metallurgy Research Building (CMR): The following are noteworthy: • Two Wing 2 workers on Monday recognized intermittent alarming hand probes as an abnormal condition and called a radiological controls technician (RCT); the RCT discovered a contaminated probe and a glovebox glove with greater than 1 M dpm alpha (possibly legacy Pu-238); appropriate actions were taken, and no spread of contamination resulted; • CMR has reported 2 toxic-gas stainless-steel bottles that did not meet safety basis administrative controls, indicating a safety program lapse; the bottles are being stored in fume hoods pending proper disposition; • CMR is poised to begin installing new fire doors on wing entrances to the spinal corridor, thereby addressing the wing-to-wing flash-over concern; the effort has been delayed while NNSA and LANL negotiated a safety basis interpretation for all the CMR fire doors; NNSA and LANL would be well-served to formally capture the safety basis interpretation so that the safety basis accurately reflects the facility's nuclear safety requirements.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 9, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 9, 2007

Federal Oversight: The acting NNSA Los Alamos Site Office (LASO) Manager presented his plan this week for adjusting the site office organization. The plan focuses on defining and staffing the long term site office management structure, ensuring facility representative coverage for nuclear facilities and placing additional emphasis on expeditious completion of training and qualification efforts for site office personnel. This plan also dissolves the 3 existing integrated operating teams (IOTs) with all currently deployed personnel returned to their parent organizations within the site office to focus on training and qualification. Two new IOTs (one for defense programs facilities; one for environmental management facilities) will be created and staffed as qualified personnel become available.

Contaminated Injury Investigation: Last week, the investigation team separately briefed LANL and NNSA management on the two contaminated wound incidents that occurred in January (site rep weeklies 2/2/07, 1/19/07, 1/12/07).

On Jan 8th, a CMR Wing 2 glove-box worker pierced a finger with a screwdriver while attempting to pry free a plutonium specimen from an epoxy mount. He was working alone. He withdrew his arms from the glove-box gloves, went into the next room to phone for assistance, and reached someone on his fourth attempt, who notified the CMR operations center. Radiological assistance arrived, and the worker was escorted to medical within an hour. LANL medical first excised the wound and then began chelation after 5 hours. Intermittent treatment continued for several weeks and reduced but did not eliminate the embedded activity. LANL expects a preliminary dose estimate in about 4 months.

On Jan 17th, a TA-55 machinist scratched his wrist on a lathe bit while donning a cotton glove over a glove-box glove. Per their training, personnel evacuated the room, and a radiological control technician assisted the machinist in donning a respirator before he withdrew his arms from the glove-box. The machinist was deconned and taken to LANL medical within two hours. The wound count slightly exceeded the guidance level for chelation, which began after 5 hours. Treatment continued for 2 days. Since the activity was close to the skin's surface, it was readily excised and eliminated.

Management responded as follows: Jan 11th – the responsible CMR group leader directed a review of operations involving sharp objects; Jan 17th – the responsible TA-55 division leader paused operations pending a review of sharp objects; Jan 19th – the responsible TA-55 associate director formally directed actions to enhance glove-box safety; Jan 20th – the responsible CMR associate director paused CMR glove-box operations; Jan 22nd – the LANL Director appointed a joint investigation team.

LANL's investigation identified several causes, which are similar to those of past events: • personnel did not follow procedures; • management expectations and supervision were inadequate; • management ineffectively responded to precursors; • some LANL managers lack the experience and training required to ensure that daily work is performed safely, while others with such experience are ineffectively used; • the CMR work was expert-based vice procedure-based; • the TA-55 work involved a hazard (the cutting bit) that management didn't eliminate or remove. The team also observed a lack of formality and consistency in the medical response. Schedule pressure and a perception of "mission over safety" had apparent roles. LANL is developing corrective actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 16, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 16, 2007

Transuranic Waste Operations: LANL is past mid-way and largely on track to upgrade the waste repackaging facility (WCRR) and start remediating high-activity drums by May 1st (site rep weekly 2/23/07). This has been an intense, closely-managed campaign. Key milestones include: complete the safety basis review, procedures, and physical upgrades (e.g. seismic, vehicle barriers, transportainers) by Mar 31st; complete operator training (already started) by Apr 6th; complete the management self-assessment (MSA) and a separate contractor assessment in parallel, and federal and contractor readiness declarations by Apr 13th; complete the NNSA operational readiness review (ORR), which will have LANL-funded contractor participants, by Apr 26th; close findings and start up by May 1st.

May 1st startup is not assured; there are substantial parallel activities and a high reliance on NNSA approving exemptions to the startup order (DOE O425.1c), the facility safety order (DOE O420.1B), and the nuclear safety management rule (10 CFR 830) within the next few weeks. The startup order exemption involves accepting the parallel nature and rigor of the contractor readiness reviews. The facility safety order exemption involves accepting lack of fire suppression for concrete vehicle barriers and metal transportainers. The 10 CFR 830 exemption involves proceeding in advance of NNSA issuing a safety evaluation report (SER); NNSA expects to issue the SER in April and expects LANL to deliberately implemented it, possibly but not necessarily by May 1st.

Plutonium Facility (TA-55): This week, TA-55 transferred caustic and acid liquid waste to the Radioactive Liquid Waste Treatment Facility (RLWTF) – the first such transfers since RLWTF completed its tank replacement outage (site rep weekly 2/23/07). The transfers were delayed because of configuration management and other issues at TA-55. After the transfers, TA-55 discovered localized contamination near transfer line connections in the basement, which is under investigation.

Los Alamos Neutron Science Center (LANSCE): On Mar 7th, a LANSCE worker alarmed the personnel contamination monitor (PCM) while exiting a contaminated area; a radiological control technician (RCT) responded but then left to support other operations, expecting a 2nd RCT to assist the worker; the worker decontaminated himself, processed through the PCM without alarm, and left the site. Due to mis-communication, there was no RCT followup. The next day, an RCT detected residual contamination on the worker's left wrist before he was scheduled to reenter the contamination area. As a precaution, a radiological assessment team deployed and found no contamination in the worker's vehicle or home. LANL is investigating the event, which released no contamination but has commonalities with the July 2005 Am-241 contamination event (site rep weeklies 7/29/05, 2/3/06).

Quality Assurance: This week, NNSA approved the LANL Quality Assurance Program, as submitted on Mar 2nd in accordance with the Nuclear Safety Management rule (10 CFR 830). NNSA expects LANL to implement compensatory measures and to submit a monthly status report until the plan is fully implemented (site rep weekly 11/24/06).

Weapons Engineering Tritium Facility (WETF): WETF resumed normal operations this week after completing a major ventilation upgrade (site rep weekly 11/3/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 23, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 23, 2007

Plutonium Facility: This week, TA-55 declared a TSR violation and stood down operations when gas cylinders were found to lack the multiple restraints required by a specific administrative control (SAC). The existing wording of the SAC lacked specificity and could be interpreted as requiring every vessel containing pressurized gas in the facility to have dual restraint, regardless of the volume and working pressure. NNSA approved a Justification for Continued Operations to clarify the applicability of the restraint requirement on Thursday, after which TA-55 resumed normal operations.

Additionally, on March 8th, NNSA approved a Preliminary Documented Safety Analysis for an interim radiography capability at TA-55 that relies on extending PF-4 safety and support systems, including confinement ventilation and fire suppression. This capability, scheduled for startup in October 2007, will reduce the need for offsite Pu shipments and substantially increase pit manufacturing efficiency.

Integrated Corrective Action Plan (ICAP): LANL is late on several ICAP corrective actions, which were developed in response to the 2005 DOE-OA review and two NNSA Type B investigations. For example, LANL informed the Board last November that an improved integrated work management (IWM) process would be implemented by September but that is now projected for November; this is one of several important ICAP commitments. LANL management is increasing attention to this area.

Chemistry and Metallurgy Research Building (CMR): LANL is evaluating the mission needs and safety implications of extending CMR lifetime, notionally to 2016 (site rep weeklies 1/19/07, 12/1/06). Specifically, LANL expects within a few weeks to finish a study on mission needs and durations to support wing closure planning and, by October, to assess associated hazards and potential control strategies, leading to a safety basis upgrade in FY-08.

In parallel, CMR is now vacating offices and removing material-at-risk from the two northern wings (2 & 4), considered to be the most seismically vulnerable. Wing 9 has been quiescent but is about to begin a characterization activity on activated structural components (i.e. Co-60 hazard); planning continues for other Wing 9 missions, including installing a large vessel clean-out capability (a DOE commitment under Recommendations 94-1/00-1) and addressing remote-handled transuranic waste.

Transportation: This week, NNSA approved LANL's annual update for the on-site transportation safety basis, the first approved update in several years. For moves involving Hazard Category 2 inventories, the update specifies a material-at-risk limit and requires using transportainers; it also retains a road closure requirement for publicly accessible roads and removes the requirement for restricted roads (i.e., the Parajito corridor). NNSA and LANL assert that the controls assure equivalent, though not identical, safety to that provided by Department of Transportation requirements.

Management: On Thursday, the LANL Director summarized management's multi-year goals and near-term commitments, including those involving safety, and distinguished these from the performance based incentives negotiated with NNSA. Also this week, LASO re-initiated an integrated operations team focused on the national security mission (i.e., TA-55, CMR, WETF).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 30, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 30, 2007

Goff was on site this week to observe a criticality assembly control system design review.

Operational Assessments: This week, LANL completed its first Institutional Evaluation Board (IEB) review of a nuclear facility (WETF); a report is expected in a few weeks. LANL intends to conduct periodic IEB reviews of its nuclear and high-hazard facilities and has patterned the IEBs after the Facility Evaluation Boards used at other sites to increase senior management's awareness of issues.

Transuranic Waste Operations: LANL has proposed a new safety basis for the WCRR facility to support repackaging high-activity drums; NNSA expects to issue a safety evaluation report (SER) by Apr 13th, eliminating the need for an exemption from the Nuclear Safety Management rule (10 CFR 830). LANL is adding two weeks to the schedule to reflect this change, as well as to provide the facility more time to improve the roughly 80 procedures involved and to train and qualify operators.

LANL management asserts that they will not declare readiness until they are ready; they are adding an extra week for the management self-assessment and resolution of pre-start findings and another week for the NNSA operational readiness review (ORR), for a total slip of about a month. The schedule still assumes that NNSA and LANL forgo a contractor ORR, and it still requires an exemption to the DOE startup order (DOE O 425.1C). The earliest startup would be the week of May 29th.

Except for a non-schedule-controlling ventilation modification, WCRR physical upgrades should be completed within a few days; these upgrades eliminate or reduce some hazards (natural gas, wildfire) and improve seismic capacity, fire suppression, ventilation reliability, lightning protection, and robust outside storage. Predicted unmitigated accident consequences are at least an order of magnitude below those at other LANL Hazard Category 2 facilities (e.g. TA-55, Area G). The primary controls are inventory limits, the waste containers, vehicle barriers, and vehicle access and fueling restrictions.

Plutonium 238 Operations: LANL has committed to disposing of the remaining Pu-238 residues by June 30th from the TA-55 storeroom that was contaminated in Aug 2003. Last November, LANL informed the Board that these residues pose about a quarter of the risk due to TA-55 packaged materials; while improved, their storage conditions (e.g., non-robust containers, some combustibles) mimic those assumed in some of TA-55's highest consequence accident scenarios. Currently, TA-55 has prepared about 100 of the 250 estimated waste drums required, working to a 56 Ci drum limit.

To ensure they meet the commitment and to reduce the significant handling risk and worker dose, TA-55 intends to begin loading higher-activity containers of non-hydrogenous residues into pipe over-pack containers (POCs). While this seems to be a WIPP-compliant configuration, WIPP and LANL are not able to certify such packages now above 100 Ci. Within a few months, they hope to have certified sealed sources available to extend their non-destructive assay calibration range to 200 Ci; by inserting, in some cases, a single can into a POC, this should allow LANL to de-inventory the TA-55 storeroom and ship these high-activity drums to WIPP in a timely manner. LANL appears to need POC certification and shipping capability, possibly to even higher activity levels, in order to address the current large residue backlog and avoid recreating such a backlog in the future.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 6, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 6, 2007

Keilers was offsite this week. T. Davis was onsite to augment site rep coverage.

Los Alamos Throughput Improvement Plan (LATIP): The acting NNSA site office manager introduced the LATIP this week. This plan represents a prioritized list of focus areas for site office management across the breadth of organizational responsibilities (i.e. safety, security, business systems, etc.). Items identified as warranting the most urgent attention include improving the training and qualification status of the existing workforce and addressing site office staffing deficiencies; developing an integrated site office assessment plan; ensuring the laboratory contractor assurance system is open and responsive to site office issues; and, supporting required actions to achieve timely sitewide risk reduction through the disposition of legacy transuranic waste.

Pajarito Laboratory (TA-18): This week, TA-18 was formally downgraded from a Hazard Category 2 nuclear facility to a low hazard radiological facility. Approval to downgrade followed the successful completion of a laboratory management self assessment that verified the reduced facility inventory and confirmed that adequate controls were in place to safely operate and maintain TA-18 as a radiological facility. This downgrade culminates several years of intense effort to de-inventory significant quantities of special nuclear material (see site rep weeklies 6/2/06, 5/20/05, 10/1/04). The new radiological categorization was based on a segmentation strategy where remaining material (mostly large chunks of natural and depleted uranium packaged for shipment to the Nevada Test Site) was split amongst 3 physically separated transportainers to preclude interaction. The balance of TA-18 was identified as a fourth facility segment. Material inventories in the 3 transportainers constitute 83%, 82%, and 50% of the Hazard Category 3 threshold defined in DOE Standard 1027.

Plutonium Facility: TA-55 is currently operating under a safety analysis report that is more than a decade old and a set of interim technical safety requirements (TSR) that were originally slated to expire in July 06. LANL submitted an updated documented safety analysis (DSA) and TSR document last November. The site office recently formally responded to this submittal noting that the documents were deemed noncompliant with the Nuclear Safety Management rule (10 CFR 830) and were not approvable. Identified areas of noncompliance included the use of non-conservative analytical assumptions, inadequate flowdown of credited DSA controls into the TSR, generation of safety-affecting data using computer programs that lacked appropriate software quality assurance, and inconsistencies between fundamental input documents (e.g. the Fire Hazard Analysis) and the DSA. Prior to resubmitting the documents, LANL has communicated an intent to comprehensively review the detailed comments generated by the NNSA review, convene a workshop with NNSA to discuss lessons learned and develop a common understanding of expectations, and subject final revisions to an independent internal review followed by an external review using LANS corporate parent resources.

Developing a rule-compliant safety basis that accurately reflects current facility conditions and operations and identifies effective, well defined controls that are clearly traceable to rigorous hazard and accident analyses is critically important for the operation of TA-55. However, this is a necessary but not sufficient step; material condition and infrastructure issues must also be understood and addressed to ensure the facility can reliably and sustainably support its ambitious future mission.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 13, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 13, 2007

Radioactive Liquid Waste Treatment Facility: Due to unexpected costs only recently recognized, LANL is starting to demobilize the Waste Management Risk Mitigation project, which involved constructing a new Hazard Category 2 pump house and tank facility, now 75 % complete; NNSA has asked for an explanation. This project was intended to increase low-activity liquid waste storage and address concerns that arose during the Cerro Grande fire (site rep weeklies 4/7/06, 1/27/06, 8/30/02).

Contaminated Injury Investigation: Last week, LANL management released the investigation report for the CMR and TA-55 contaminated wound incidents that occurred in January (site rep weekly 3/9/07). The exposures to affected personnel are still being determined. NNSA appears to have accepted the lab's investigation. LANL is developing a corrective action plan.

Plutonium Facility (TA-55): Weaknesses in first-line supervision contributed to the above incidents (site rep weekly 3/9/07). TA-55 is improving first-line management and span of control, including posting about 50 to 60 new management positions that will replace current non-managerial team leader positions. Also, as part of the response to the above incidents, TA-55 management is conducting a glovebox-by-glovebox inspection; the LANL criticality safety group recently joined the inspection team and is simultaneously conducting the annual review of fissile material operations.

On Monday, this joint team discovered two staging gloveboxes in an aqueous processing room that had liquid lines that were valved-out but not disconnected or locked-out, as required by the criticality safety posting; the lines were subsequently locked-out. This was a good catch and illustrates the value of such periodic reviews for continuously improving facility safety.

Transuranic Waste Operations: LANL continues to make progress toward startup of the high-activity waste drum campaign in the WCRR repackaging facility, but the schedule appears increasingly at risk (site rep weekly 3/30/07). Specifically, NNSA has approved the exception to the DOE startup order (DOE O 425.1C) and has informally provided final comments on the WCRR safety basis but has slipped issuance of a safety evaluation report (SER) by 10 days, to Apr 23rd.

While LANL believes that they will be ready for an operational readiness review (ORR) by mid-May, the SER slippage could delay finalizing procedures, training and qualifying operators, and conducting the initial periodic inspections and surveillances of safety systems – thereby impacting readiness for a mid-May ORR. That said, further delay in WCRR startup could eventually impact disposition of both low and high activity drums, which has safety implications for Area G (site rep weekly 1/5/07).

Contractor Assurance System (CAS): LANL is implementing the CAS, but CAS maturity still appears several years away, considering that: • the late discovery of problems with the Waste Management Risk Mitigation Project are possibly linked to the maturity level of CAS; • LANL managers are still having difficulties using the issue management software (LIMTS), which is evolving; • many scheduled assessments are being delayed; • numerous long-standing corrective actions from occurrence reports are now being rapidly but not necessarily effectively closed (site rep weekly 12/1/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 20, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 20, 2007

Plaue was here this week augmenting site rep coverage.

Plutonium Facility (TA-55): TA-55's proactive glove-box inspections, reported last week, are continuing to find discrepancies between operations and their criticality safety postings, such as: • lean solutions in bottles in a glove-box with posting indicating solutions should be in the columns (i.e., tanks) except when filling or emptying, which was done ~2 weeks ago; • a practice of staging small transuranic waste containers (e.g., Hagan cans) on the floor while the posting indicates only 15, 30, or 55 gal drums are permitted on the floor. The latter has led management to curtail transuranic waste packaging until procedures are implemented consistent with the posting, expected next week.

Criticality Safety: These events are similar to the case reported last week and will probably not be the last found by TA-55's ongoing glove-box inspections, which is commendable. Upon review, LANL is also finding that many of these discrepancies (including last week's) were already recognized and documented during last year's criticality safety walk-downs; corrective actions for these typically were assigned a low priority in LANL's extensive multi-year criticality safety improvement plan (site rep weekly 12/22/06). However, operating contrary to criticality safety postings may de-sensitize operators to the postings – an important element of criticality safety and conduct of operations; TA-55 is working on an interim solution. In some cases, such as the TA-55 waste packaging operation, the LANL criticality safety group is reassessing the priority assigned to addressing the issues.

Transuranic Waste Operations: Modifications to the WCRR waste repackaging facility, necessary for the high-activity waste drum campaign, are 98 % complete; ventilation control testing is planned this weekend. LANL expects to submit the final rule-compliant safety basis to NNSA today; NNSA expects to issue a safety evaluation report on it by next Tuesday. The final stage of operator training and qualification begin next week; the management self-assessment is expected the following week.

The highest activity drums and degraded drums are over-packed; inner drum integrity is not readily ascertainable until removed. These drums have been found to be generally robust structurally, with occasional corrosion holes; however, it is conceivable that the inner drum could fail while being lifted, spilling its contents. The current safety basis hazard analysis considers a degraded drum failing during handling outside but not inside the building; NNSA and LANL are now considering this scenario.

LANL still awaits NNSA action on an exemption request to fire protection requirements in the DOE facility safety order (DOE O 420.1B). The most significant proposed exemption involves lack of automatic engineered fire suppression within the WCRR glovebox. Near-term, LANL will stage fire control agents within the glovebox, and train operators in their use, as well as assign a fire watch during high-activity glovebox operations. By December 1st, LANL has committed to evaluate the upgrades required for compliance and has committed to implement those upgrades before processing drums with activity exceeding the current safety basis limit (i.e., 300 Ci combustible waste).

Given the expected NNSA safety evaluation report and the implementation of a rule-compliant safety basis, LANL believes that WCRR can be used not only for the high-activity drums aboveground but also those belowground with activity below the current safety basis limit.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 27, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 27, 2007

Criticality Safety: In response to the issues reported last week, the Plutonium Facility (TA-55) intends to work with the LANL criticality safety group and reconcile known discrepancies between operations and their criticality safety postings before the criticality safety evaluations are updated, which is scheduled during the next three years; this is positive (site rep weekly 12/22/06).

Radioactive and Nondestructive Testing (RANT) Facility: Current material inventory restrictions limit the capacity and packing efficiency of TRUPACT container loading operations at RANT (see site rep weeklies 7/21/06 and 3/18/05). To ease these restrictions and expedite the high activity transuranic waste disposition campaign, the laboratory has proposed a strategy to increase inventory limits inside the building almost 8 fold, up to 1840 Pu-239 equivalent curies. Short term, the strategy calls for development and NNSA approval of page changes to the existing safety basis that re-analyze accidents using new assumptions and credit new administrative controls, including combustible loading limits and vehicle restrictions. Longer term (i.e. by end FY07), the lab plans to use the new analysis to develop a safety basis that is fully compliant with the Nuclear Safety Management Rule. No major modifications or upgrades to existing engineered controls are proposed by this strategy.

Seismic Criteria: The updated LANL Probabilistic Seismic Hazards Analysis (PSHA) is due out in May and is expected to conclude that seismic hazards at the site are higher than previously believed; e.g. roughly 50% increase in PC-3 seismic criteria (see site rep weekly 12/22/06). Prior to PSHA issuance, LANL plans to submit a site-wide justification for continued operations (JCO) to keep running until prioritized facility-specific structural analyses can be prepared to identify vulnerabilities and aid development of JCOs for individual facilities, as needed. Impacts to new design and construction projects in various phases of development have yet to be determined.

Chemistry and Metallurgical Research Building Replacement Project (CMRR): The CMRR safety basis subcontractor has submitted to LANL an initial draft of the CMRR preliminary documented safety analysis (PDSA) that is largely reflective of the current design. The draft PDSA analyzes 11 design basis accidents and provides the preliminary basis for functional classifications and requirements for credited safety controls. The project asserts that it is committed to maintaining close integration between the design and safety analysis efforts. This will be key to ensuring controls are designed with appropriate functional attributes and pedigree, thus preventing costly retrofits.

Nuclear Material Stabilization: Last Friday, LANL management approved a comprehensive nuclear material packaging and storage plan for TA-55 that is intended to address a series of related corrective actions dating from the December 2005 vault contamination and the August 2003 Pu-238 uptakes. The objective is to repackage all non-standard items by the end of 2010, eliminating associated risks. The plan describes the progress made, such as: • the number of non-standard containers has been reduced by a third over 5 years; • the risk to workers due to non-standard containers was reduced by a third between May 2004 and Sep 2006; • 951 items have entered the WIPP-disposal pipeline since FY03. The plan retains a high dependence on Area G receiving about 7.5 kCi/yr during the next four years. It addresses most but not all of LANL's nuclear material (e.g., CMR has ~1,000 containers that are out of scope). LANL expects to establish a site-wide standard in conjunction with DOE actions in response to Board Recommendation 05-1 (site rep weekly 12/29/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 4, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 4, 2007

Anderson, Davis, Bamdad, Laake, Roscetti, Plaue, & Shackelford were here this week reviewing TA-55.

Plutonium Facility (TA-55): The basis for safe nuclear operations in TA-55 remains the interim technical safety requirements (iTSRs) that NNSA approved in July 2005 and that LANL verified to be implemented, with a few issues, in August 2006. The iTSRs constitute a judgement-based consolidated set of controls from unreviewed safety questions against the last approved safety basis (1996), a proposed 2002 safety basis, and the approved 2005 compensatory measures to address building passive-confinement concerns. They are essentially a stop-gap measure taken until LANL develops and justifies and NNSA approves a fully compliant safety basis (site rep weekly 4/6/07).

TA-55 continues to better understand and define their infrastructure needs, but those needs appear increasingly challenging. In particular, the scope of the line-item TA-55 reinvestment project was established 3 years ago and doesn't entirely reflect the currently understood facility needs; it does include some elements that are crucial to nuclear safety, such as seismically upgrading furnace glove-box supports. The facility would benefit from a responsive and stable sub-line-item mechanism to prioritize, plan, and fund upgrades.

Recommendation 04-2: Resolution of TA-55's passive-confinement issue remains elusive. TA-55's last proposed safety basis (Nov 2006) highly relied on personnel taking certain actions during an emergency that minimize building passive leakage (1.6 %). In March, NNSA questioned whether these assumptions were reasonably conservative. Separately, in December 2006, LANL completed a confinement evaluation that identified potentially beneficial active confinement improvements; LANL still awaits federal comments on the study (site rep weeklies 4/6/07, 12/15/06, 9/22/06, 6/16/06).

Delaying the long awaited TA-55 safety basis update in order to resolve the confinement issue would defer important efforts to address a broad range of other issues arising from TA-55's current decade-old, non-compliant safety basis. An alternative might be for the site to commit in the new safety basis to improving TA-55 active confinement, consistent with DOE Secretarial commitments to the Board, and then to plan and execute those improvements during the next few years while updating the safety basis annually to reflect the current confinement capabilities and expected end-state.

Transuranic Waste Operations: NNSA issued a safety evaluation report on April 25th approving the Waste Characterization Reduction and Repackaging Facility safety basis. However, overall readiness preparations for the facility are behind schedule and the operational readiness review to support high activity waste disposition work is likely to slip (see site rep weeklies 4/13/07, 3/30/07, 2/2/07).

Additionally, this week LANL reported the results of a four month inventory reconciliation effort at Area G in which 38 containers with a total of 169 Pu-239 equivalent curies could not be accounted for. For perspective, the current above-ground inventory at Area G includes roughly 20,000 containers that hold approximately 130,000 Pu-239 equivalent curies of material.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 11, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 11, 2007

Federal Oversight: NNSA has directed LANL to implement a set of compensatory measures to address apparent inconsistencies in the application of federal and laboratory readiness review requirements. These measures include requiring NNSA approval of all startup notification reports for nuclear facilities and activities before LANL starts each readiness review and the activity. NNSA expects that implementation of new LANL readiness review procedures that actively include federal personnel in the process for determining level-of-review should resolve these issues.

Transuranic Waste Operations: NNSA has informally directed LANL to conduct a contractor operational readiness review (ORR) for the WCRR repackaging facility's high-activity waste drum campaign; formal direction, including revoking the DOE O 425.1C exemption, is expected shortly. The site reps believe this pushes the federal ORR into July and the campaign's start into early August.

This week, the RANT shipping facility found radioactivity (120 dpm) on an in-line filter while drawing a vacuum on a TRUPACT shipping container; radioactivity (50 dpm) was also found on a second attempt. LANL has sent samples to Carlsbad to establish isotopics, which will determine whether the radioactivity is naturally occurring or contamination from a waste drum.

The Radioactive Liquid Waste Treatment Facility (RLWTF) resumed caustic waste receipt this week after the Plutonium Facility (TA-55) repaired hardware that had interrupted such transfers in March. RLWTF is no longer pursuing a waste processing campaign prior to entering an extended outage to address material condition issues, expected to be finished in September. Without near-term processing capability, waste discharges from TA-55 will be limited by RLWTF storage capacities.

Plutonium Facility (TA-55): TA-55's processes that generate caustic liquid waste, such as those that supply feed to pit manufacturing, have been idle but are now ramping up; LANL currently estimates that the RLWTF caustic waste receipt tank will reach capacity in November. TA-55 is pursuing strategies to temporarily ease reliance on caustic generating processes since operations like pit manufacturing could be impacted due to lack of feed if the RLWTF outage discussed above does not finish as scheduled; such contingency planning appears warranted to reduce schedule pressure on the RLWTF outage, which is long overdue and needs to be deliberately executed.

Chemistry and Metallurgy Research Building (CMR): CMR has completed fire door installation and, on Thursday, closed out the Justification for Continued Operation (JCO) for potential wing-to-wing flash-over across the spinal corridor during a fire (site rep weeklies 3/2/07, 11/17/06).

Weapons Engineering Tritium Facility (WETF): WETF is engaged in a multi-year effort to reduce its legacy inventory, which reduces risk to both workers and the public. For example, the current tritium inventory is significantly less than assumed in the 2002 safety basis and is expected to be an order-of-magnitude less within a few years. Also, legacy items that caused an unanticipated room and stack release in January 2001 have been properly disposed as waste (site rep weekly 3/14/03).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 18, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: Chuck Keilers and Brett Broderick, LANL Site Representative
SUBJECT: Activity Report for Week Ending May 18, 2007

The site representatives were at DNFSB-headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 25, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending May 25, 2007

Federal Oversight: On Thursday, NNSA transmitted to LANL a conduct of operations assessment of nuclear facility control room activities, and shift routine and operating practices. NNSA facility reps assessed their respective facilities, and collectively reported 9 observations, 3 strengths, 0 findings; the assessment generally concluded that the facility gap analyses in these areas were accurate.

Quality Assurance (QA): Last week, LANL provided NNSA a two-year plan for implementing the recently approved QA Program (site rep weekly 3/16/07). Key steps include: responsible associate directorates (RADs) perform gap analyses in July; RADs submit objective evidence packages in Dec 2007; RADs have programs in place in Mar 2008; LANL perform effectiveness reviews by Mar 2009.

Authorization Basis: This week, NNSA approved a justification for continued operation (JCO) allowing the Chemistry and Metallurgy Research Building (CMR) to operate while removing 6 toxic gas cylinders whose presence violates the safety basis; the non-compliant condition has existed for nearly 3 months (site rep weekly 3/2/07).

Similarly, at Area G, 34 unvented drums have been staged in violation of the approved safety basis, without a JCO, since being discovered in October 2006. Utilization and timeliness of the JCO process continues to warrant improvement (site rep weeklies 2/23/07, 10/27/06).

Transuranic Waste Operations: On May 9th, the RANT shipping facility found Pu-238 and Pu-239 on an in-line filter while drawing a vacuum on a TRUPACT shipping vessel. The TRUPACT trailer is parked at RANT pending development of a path-forward to unload the drums and decontaminate the vessel. Shipment of single-barrier high-wattage drums is suspended, but other shipments continue.

The management self-assessment (MSA) for repackaging high-activity drums starts next Tuesday and should complete June 7th. LANL has determined that at least 72 of the 235 affected drums (30%) meet WIPP requirements; the remainder (at least 156) require removal of prohibited items and repackaging in the WCRR facility; this is scheduled to start in August and to finish by end of Jan 2008.

While the progress on high-activity drums is encouraging, the site reps observe that lower activity drums (i.e., those less than 56 Ci) also drive many Area G accident scenarios and represent an enduring hazard at the current shipping rate. The rate has not improved over that reported in January (i.e., ~220 drums per month, site rep weekly 1/5/07). The 8 kCi shipped during the first eight months of this fiscal year is also comparable to the transuranic waste that TA-55 expects to generate during each of the next 4 years as it addresses its residue backlog; an option to accelerate decoupling TA-55 waste disposition from Area G is apparently not being pursued (site rep weeklies 4/27/07, 3/2/07).

Many legacy waste drums (potentially 70 % or more) will require remediation in WCRR – this is probably the rate-limiting step; however, prior plans to fund a second shift in WCRR this fiscal year have been discontinued. Extrapolation indicates that, at current rate, it could be another 8 to 11 years before the Area G above-ground transuranic waste inventory is eliminated as a hazard. Under the same assumptions, retrieval and shipment of the comparable below-ground inventory doubles the period.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 1, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 1, 2007

Broderick was off-site this week.

Contaminated Injury Investigation: This week, LANL released the corrective action plan for the CMR and TA-55 contaminated wound incidents that occurred in January; exposures to personnel are still being determined (site rep weeklies 4/13/07, 3/9/07, 1/19/07, 1/12/07). Key elements include:

- June - institutional plan for improving human performance
- July - facility-specific models for nuclear facility oversight coverage; institutional process to ensure consistency of management roles and responsibilities; management training plan, including human performance, integrated work management, performance-based leadership
- August – institutional glove-box safety program, capturing best practices, trending breaches
- September – activity-level oversight in nuclear facilities, distinct from work supervision
- October – new first-line leadership positions with technical and operational responsibilities
- January 2008 – human performance training completed by all current managers.

Plutonium-238 Operations: LANL has removed all Pu-238 residues from the TA-55 storeroom contaminated in Aug 2003; the room has been down-posted from an airborne radioactivity area to normal access. The safe recovery of this storeroom and disposition of these residues are significant and commendable accomplishments that eliminated hazards to the public and the workers.

Four years ago, this room had 238 residue packages, containing 800 grams of Pu-238 residues, radiologically equivalent to about a quarter metric ton of weapons-grade plutonium. Some residues were a decade old; some were intermixed with combustibles in poor containers within degrading plastic bags; conditions paralleled those assumed going into TA-55's worst case accident scenarios.

Last November, LANL informed the Board that these residues also posed about a quarter of the worker-related risk due to TA-55 packaged materials. In August 2003, two workers received Pu-238 uptakes in this room when an internally corroded package failed; the simple act of handling the package was sufficient to dislodge corrosion and release contamination into the room.

In 2004, little progress was made decontaminating the room due to safety basis issues and the LANL stand-down. By mid-2005, the room was largely decontaminated; emphasis shifted to the residues. By late 2005, LANL had disposed of the lean residues and 40 % of the packages. High-activity containers were problematic because of the handling risk during contents-splitting and the large projected waste volume, comparable to a decades' worth of TA-55's transuranic waste. By late 2006, LANL and WIPP had agreed on a way to decrease waste volume by an order of magnitude. In 2007, LANL loaded the highest-activity containers into pipe over-pack containers, minimizing handling risk.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 8, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 8, 2007

Davis, Elliott, Goff, Plaue, and Moury were here this week reviewing criticality safety and TA-55 vault operations. Rizzo and Andersen attended a contractor review on the updated seismic hazard analysis and walked down portions of the CMRR construction site related to seismic investigations. Andersen also attended the in-brief for the month-long CMRR nuclear facility Phase Y design review.

Pit Manufacturing: This week, NNSA certified (i.e., diamond stamped) a W-88 pit made by LANL. The last certified pit was made by Rocky Flats and was delivered in 1989.

Plutonium Facility (TA-55): On Monday (6/4), LANL began a three-week institutional assessment of TA-55 operations, patterned after the Facility Evaluation Board (FEB) model used at other sites. This is the third such assessment at LANL and the second at a nuclear facility (site rep weekly 3/30/07).

On Thursday (6/5), two TA-55 workers were hospitalized briefly due to heat stress. The workers were part of a team removing pencil tanks and were wearing respirators and 3 layers of protective clothing due to chemical (acid) and radiological hazards. The team had previously removed several tanks while wearing 2 layers; the third layer and a thicker acid suit were recent changes. TA-55 is curtailing some work and reevaluating work controls, such as stay-times, for these types of jobs.

Criticality Safety: LANL has near term plans to reestablish the Nuclear Criticality Safety Committee (NCSC) and to augment the cadre of full-time criticality safety officers (CSO). These are positive steps in that the NCSC provides independent institutional oversight to help ensure the criticality safety program is robust and adding well trained CSOs helps ensure the program is implemented effectively.

Other opportunities for improving the effectiveness of the criticality safety program may be gained by strengthening the interfaces with other institutional programs. For example, until planned enhancements to the configuration management system are enacted, changes to processes, procedures, and equipment that could affect assumptions or controls important for criticality safety may not receive appropriate review; compensatory measures may be warranted in the interim. Also, the antiquated security-related MASS software program plays a role in maintaining criticality safety, although it was not designed for this function. MASS modernization and functionality improvements are being planned, but funding for much needed upgrades to this critical system is uncertain.

Transuranic Waste Operations: On Wednesday (6/6), LANL completed a thorough management self-assessment (MSA) for repackaging high-activity waste drums in the WCRR facility. A major focus was proficiency of the operators, who have endured several training iterations and an order of magnitude increase in the number of procedures required to run the facility (now roughly 120).

There were numerous findings and observations, including concerns about whether the facility can meet the NNSA-approved combustible loading limits; some operating, surveillance, and in-service inspection procedures were not finalized; some baseline surveillances were not complete. The two-week contractor operational readiness review is expected to start Monday (site rep weekly 5/25/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 15, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 15, 2007

Burnfield, DeLoach, and Slater-Chandler were on site this week participating in DOE workshops on the line oversight contractor assurance system, federal oversight awareness, and the QA roadmap.

Dual Axis Radiographic Hydrodynamic Test (DARHT) Facility: The DARHT Facility recently performed its first fully-contained hydrotest using an engineered vessel. This new containment philosophy prevents the release of hazardous materials during hydrotests and could facilitate increasing the test rate by eliminating the need for post-shot cleanup at the firing site. Also, the second axis has demonstrated multi-pulse capability and will soon begin commissioning.

Formality of Operations: LANL has proposed to NNSA new milestone dates for implementing conduct of operations, engineering, and maintenance; however, integration with conduct of training is not apparent. Making comparable improvements to institutional training are integral to overall success.

Transuranic Waste Operations: The contractor operational readiness review (ORR) started Tuesday for repackaging high-activity waste drums in the WCRR facility, based on management's judgement that the 13 open pre-start findings from the management self-assessment (MSA) are tractable. The contractor ORR team is proceeding deliberately and should finish next week.

The facility has had difficulty demonstrating proficiency during drills and evolutions, largely because of issues such as (a) the level of maturity of procedures and completeness of records, and (b) the degree of simulation. While the former could have been avoided by a longer shakedown period after the MSA (i.e., at least a week), the latter would likely not have been recognized until operations were reviewed by an experienced ORR team – validating the decision to perform a contractor ORR.

Contractor Assessments: The institutional assessment of TA-55 that began last week had a slow start (e.g., CRADs finalized last Friday); field work is extending into next week. This is a new assessment process for LANL that needs to evolve; it is showing potential to improve management's operational awareness and its ability to identify and correct adverse conditions early.

Plutonium Facility (TA-55): NNSA has approved a safety basis revision to support nuclear material radiography in the tunnel (site rep weekly 3/23/07). The revision includes a new limiting condition for operation (LCO) action statement that allows 8 hours to restore building confinement integrity if lost or if disabled intentionally when no alternatives exist, such as during upcoming tunnel modifications. NNSA approved the revision subject to – prior to such intentional disablement – LANL notifies the NNSA facility rep, confirms safety basis assumptions are not significantly affected (e.g., differential pressures are maintained), and has material staged for quickly restoring confinement in an emergency.

TA-55 operations continue to be impacted by equipment failures, highlighting infrastructure needs. This week, the aqueous processing area wet vacuum system went down when the one operating pump failed while the other pump is undergoing extensive repair; this restricts solution transfers. Last Wednesday, PF-4 went into standby twice due to a facility power loss and to Facility Control System issues. The trolley systems, key to material moves between glove-box lines, are experiencing failures.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 22, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 22, 2007

Plutonium Facility (TA-55): This week, LANL completed the Director's Assessment of the TA-55 Plutonium Facility; the report is in preparation. The assessment included more than 200 interviews, 100 document reviews, and 50 observed evolutions. Some of the team's preliminary observations included: • PF-4 is LANL's signature nuclear facility and should be held to the highest level of asset management, commensurate with its value to LANL's continuing role; • work at TA-55 is performed safely overall, primarily because of the experienced personnel (many approaching retirement); • implementing institutional improvements (e.g. in operations, engineering, maintenance, and configuration management) warrants priority; • slow progress on work control corrective actions is a continuing risk; • there are vulnerabilities in relying on LANL's existing waste facilities (i.e., RLWTF, Area G) but no implementation plan for addressing newly generated transuranic or liquid waste for the next two decades.

As briefed this week, the site reps believe that this assessment establishes a comprehensive and timely baseline of the facility's needs and conditions; the facility should also be commended for thoroughly communicating its recognized issues and plans to the assessment team.

Transuranic Waste Operations: Completion of the contractor operational readiness review (ORR) for the WCRR waste repackaging facility has slipped until next Wednesday to allow additional assessment of the safety basis functional area. Open lines of inquiry are focused on the facility's ability to successfully perform surveillances and inspections that verify effective implementation of credited controls. LANL will present a schedule for issue closure and for the conduct of a federal ORR after the contractor review and report are finalized next week.

NNSA has approved an amendment to the basis for interim operations (BIO) for the RANT waste shipping facility that will increase the inventory limit inside the building to allow shipping high-activity waste drums (site rep weekly 4/27/07). The amended BIO features reduced predicted accident consequences based on data from the new DOE Standard 5506, re-categorization of some engineered controls from safety-class to safety-significant, and new administrative controls. LANL plans to submit a BIO compliant with the Nuclear Safety Management rule (10 CFR 830) by the end of FY07.

Los Alamos Neutron Science Center (LANSCE): In response to the DOE General Counsel decision that LANSCE is an accelerator facility exempt from 10 CFR 830, LANL is working on a safety assessment document (SAD) per DOE Order 420.2B; it's targeted for September and will ultimately serve as the facility's safety basis (site rep weekly 10/20/06). This week, NNSA approved an extension to the existing set of 5 safety basis documents to provide a basis for continued LANSCE operation until the SAD can be approved and implemented.

NNSA has also approved a request to perform dynamic experiments using up to 8 grams of plutonium metal and 4 grams of high explosives (HE) in the proton radiography dome at LANSCE. Experiments will be conducted in a robust vessel designed to contain detonations of up to 10 lbs. of HE; experiments that would cause bulk melting of plutonium samples are prohibited.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 29, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 29, 2007

Broderick was off-site this week.

Federal Management and Oversight: NNSA announced this week the assignment of a new Los Alamos Site Office (LASO) Manager, effective July 8th. The NNSA Chief of Defense Nuclear Safety also had a team on site this week, preparing for the biennial review scheduled Jul 30th - Aug 9th; LASO is the last of the first round of such reviews of site office operations (site rep weekly 1/12/07).

Transuranic Waste Operations: This week, LANL completed their operational readiness review (ORR) of the WCRR repackaging facility high-activity drum campaign and briefed the federal ORR team on the status. LANL expects to declare readiness for the federal ORR on or before July 11th, to support the federal review occurring July 16th - 27th.

LANL has identified 14 pre-start findings that need to be resolved or shown to be manageable before declaring readiness. One involves the presence of about 275 gallons of mineral oil in an external transformer about 5 feet from the facility; LANL plans to construct a fire wall between the facility and the transformer and to propose a safety basis revision that reflects this new design feature. Another involves NNSA action on a proposed exemption to DOE requirements for automatic engineered fire suppression in the glovebox; LANL has staged fire control agents within the glovebox for operator use and is assigning a fire watch during high-activity glovebox operations (site rep weekly 4/20/07).

In other areas, LANL has unloaded and decontaminated the TRUPACT shipping container that was contaminated last month. LANL has also unplugged a blocked line and mobilized residual sludge in a degraded treatment tank in the Radioactive Liquid Waste Treatment Facility; this tank has been a challenge for some time. Both of these operations were well-planned and deliberately conducted.

Plutonium Operations: Operating tempo is high. Both the Plutonium Facility (TA-55) and Chemistry and Metallurgy Research Building (CMR) are conducting extended-hour operations; 24 hour/day - 7 day/week operations are being discussed at TA-55 through next weekend. Facilities are monitoring personnel overtime against LANL safety restrictions involving excessive overtime.

Chemistry and Metallurgy Research Building: LANL has determined the baseline program needs for CMR capabilities beyond 2010 and the risk reduction options; key elements include reducing operational footprint, underway in Wings 2 and 4, and moving Pu-238 analytical chemistry to TA-55. LANL expects to submit detailed planning and a safety basis strategy in September; a new safety basis would notionally be submitted in FY 08 and implemented in FY-09 (site rep weekly 3/23/07).

Tritium Operations: NNSA has closed pre-start findings from the 2004 WETF ORR and intends to declare Bldg 450 operational in cold-standby; ventilation exhaust should be connected within a few weeks. This opens the way for LANL to move radiological-scale tritium operations from other buildings into WETF, which has more robust engineered features and controls (site rep weekly 8/4/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 8, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending June 8, 2007

Davis, Elliott, Goff, Plaue, and Moury were here this week reviewing criticality safety and TA-55 vault operations. Rizzo and Andersen attended a contractor review on the updated seismic hazard analysis and walked down portions of the CMRR construction site related to seismic investigations. Andersen also attended the in-brief for the month-long CMRR nuclear facility Phase Y design review.

Pit Manufacturing: This week, NNSA certified (i.e., diamond stamped) a W-88 pit made by LANL. The last certified pit was made by Rocky Flats and was delivered in 1989.

Plutonium Facility (TA-55): On Monday (6/4), LANL began a three-week institutional assessment of TA-55 operations, patterned after the Facility Evaluation Board (FEB) model used at other sites. This is the third such assessment at LANL and the second at a nuclear facility (site rep weekly 3/30/07).

On Thursday (6/5), two TA-55 workers were hospitalized briefly due to heat stress. The workers were part of a team removing pencil tanks and were wearing respirators and 3 layers of protective clothing due to chemical (acid) and radiological hazards. The team had previously removed several tanks while wearing 2 layers; the third layer and a thicker acid suit were recent changes. TA-55 is curtailing some work and reevaluating work controls, such as stay-times, for these types of jobs.

Criticality Safety: LANL has near term plans to reestablish the Nuclear Criticality Safety Committee (NCSC) and to augment the cadre of full-time criticality safety officers (CSO). These are positive steps in that the NCSC provides independent institutional oversight to help ensure the criticality safety program is robust and adding well trained CSOs helps ensure the program is implemented effectively.

Other opportunities for improving the effectiveness of the criticality safety program may be gained by strengthening the interfaces with other institutional programs. For example, until planned enhancements to the configuration management system are enacted, changes to processes, procedures, and equipment that could affect assumptions or controls important for criticality safety may not receive appropriate review; compensatory measures may be warranted in the interim. Also, the antiquated security-related MASS software program plays a role in maintaining criticality safety, although it was not designed for this function. MASS modernization and functionality improvements are being planned, but funding for much needed upgrades to this critical system is uncertain.

Transuranic Waste Operations: On Wednesday (6/6), LANL completed a thorough management self-assessment (MSA) for repackaging high-activity waste drums in the WCRR facility. A major focus was proficiency of the operators, who have endured several training iterations and an order of magnitude increase in the number of procedures required to run the facility (now roughly 120).

There were numerous findings and observations, including concerns about whether the facility can meet the NNSA-approved combustible loading limits; some operating, surveillance, and in-service inspection procedures were not finalized; some baseline surveillances were not complete. The two-week contractor operational readiness review is expected to start Monday (site rep weekly 5/25/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 13, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 13, 2007

Federal Management and Oversight: The new NNSA Site Office Manager started this week. Also, the DOE Office of Independent Oversight (HS-64) will be here in early August to scope their next on-site health and safety assessment, which is scheduled for October (site rep weeklies 6/29/07, 1/27/06).

Transuranic Waste Operations: LANL has declared readiness for the NNSA operational readiness review (ORR) of the WCRR facility's high-activity drum campaign; this ORR is now scheduled to start July 23rd. NNSA has granted the fire protection exemption for glovebox operations without automatic fire suppression and is poised to approve a WCRR safety basis change that reflects a new fire barrier, which is to be installed between the building and a nearby transformer (site rep weekly 6/29/07).

The Radioactive Liquid Waste Treatment Facility (RLWTF) can currently receive and store but not process liquid transuranic waste discharges from the Plutonium Facility (TA-55) until modifications are completed. While caustic waste receipts are within expectations, the acid waste receipt rate is nearly double planning estimates made earlier this year. The acid tank is now half-full; this may impact TA-55 aqueous operations sooner than previously expected (site rep weekly 5/11/07).

Plutonium Facility (TA-55): LANL has submitted a new safety basis strategy document that establishes a target resubmittal date of September 28th for a compliant TA-55 Documented Safety Analysis (DSA) and describes the approach for meeting commitments stemming from the recent round of safety basis workshops with NNSA (site rep weekly 4/6/07).

Some workshop commitments require LANL to submit prototype revisions for certain topical areas to ensure the modifications meet NNSA expectations before effort is expended to implement these changes globally throughout the document. One such prototype revision, recently submitted by LANL for review and approval, provides additional explanatory discussion of leak path factor (LPF) derivation for fires in Pu-238 lab rooms. The proposed revision identifies engineered and administrative controls and physical properties of fire phenomenology that can be credited to lower the LPF and applies them successively to demonstrate their respective contribution to reductions in calculated LPFs. Application of the full suite of identified controls yields mitigated doses ranging from 14 to 27 rem CEDE for the bounding fire depending on assumptions related to external door closure times. These values do not reflect mitigation provided by the ventilation system.

Although the supplementary LPF analysis is predicated on the existing passive confinement approach, LANL has committed to incorporate any additional controls that may result from on-going activities to address Board Recommendation 2004-2, *Active Confinement Systems*, in the next annual update to the DSA. Onsite efforts to define, fund, and implement additional cost-effective controls to improve the robustness of the Plutonium Facility's confinement posture are currently on hold awaiting feedback from the NNSA Independent Review Panel on an evaluation and options study made by the site in a November 2006 report (site rep weeklies 5/4/07 and 12/15/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 20, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 20, 2007

This week, NNSA, LANL, and the staff held a video-teleconference on accident investigations and corrective actions and held a teleconference on the MASS code, used for material accountability.

Welding Issues: LANL quality assurance division recently audited the institutional welding program. Findings include: lack of control of weld filler material; welding performed to unqualified processes and procedures; welding performed by personnel who have not been adequately trained; welding not inspected in accordance with codes and standards; lack of a NDE examiner to certify inspectors; a structural steel welding procedure used on some projects (e.g., WCRR seismic upgrades) not meeting code requirements; and welding program management assessments not being performed.

These issues are similar to those found in 2003 that were the subject of substantial corrective actions through 2005; momentum and many of these gains appear to have been lost during contract transition due to lack of ownership, a condition that LANL is now correcting (site rep weeklies 9/16/05, 8/19/05, 4/16/04, 3/26/04, 1/2/04).

Nuclear Facility Infrastructure: Recent events illustrate continuing challenges, particularly for staffing and for safety system configuration management and maintenance. The Plutonium Facility (TA-55) has been in extended-hour operations for several months. This week, a wing (Zone2) ventilation system fan failed impacting operations; the shaft and bearing were replaced that night. Personnel working the switchgear upgrade project plugged an electric lift unknowingly into the uninterruptible power supply (UPS) system, impacting the facility control system, which impacted ventilation. An instrument air leak caused ventilation cycling, also impacting operations. Breaker inspections found a degraded (partially welded) chilled water system breaker, which was repaired. Acidic solution leaked from a pipe onto a glovebox and the floor, forcing a lab room evacuation; the facility appropriately responded. Acidic waste transfers to the Radioactive Liquid Waste Treatment Facility are suspended while that facility investigates anomalous tank-level increases.

Additionally, LANL has completed a staffing analysis evaluating cognizant system engineer (CSE) support for vital safety systems (VSS) at 6 operating nuclear facilities. The analysis showed that CSEs are performing numerous ancillary functions including maintenance, design, and plant engineering tasks, leaving the average VSS with only about one-third of the institutionally recommended minimum level of effort for system engineering.

Based on criteria such as expertise, level of effort, and system condition, the evaluation concluded that 9 of the 43 active systems studied had inadequate system engineering coverage and 27 were receiving marginally adequate coverage. Staffing recommendations included adding 26 engineers at TA-55 (29 existing), 5 at CMR (9 existing), 4 at WETF (8 existing), 3 at WCRR (3 existing), and 3 at RANT and Area G (3 existing) for a total recommended increase of 41 engineers to the existing pool of 52. This analysis focused primarily on CSE coverage for active systems; the staffing recommendations will not necessarily be sufficient to ensure system engineering expectations are adequately met for passive safety systems. LANL intends to begin addressing the identified needs by hiring 9 new engineers.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 27, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending July 27, 2007

Davis was on site this week observing the WCRR ORR; Plau, Roscetti, and Shackelford were here reviewing safety systems; Broderick was off-site two days reviewing Pantex lightning protection.

Engineered Controls: LANL nuclear facilities have 46 active and 47 passive safety systems. A January 27th, 2004 Board letter identified weaknesses in LANL engineering practices for determining that such systems will adequately perform their intended safety functions; a contributing factor is that the safety functions are often not clearly defined in the safety bases, which generally have not been updated. More recently, a November 2005 DOE-OA assessment reported similar issues and concerns.

Based on the staff's detailed review of 6 active systems, these issues persist: LANL still does not have the configuration management, maintenance, and engineering elements in place to demonstrably assure these systems will adequately perform their credited safety functions. For several years, LANL has been developing a conduct of engineering program to address such issues, but this effort is insufficiently supported, it's understaffed, it's under-assessed, and it has yet to increase confidence in these systems.

Transuranic Waste Operations: The two-week NNSA operational readiness review (ORR) started Monday for the WCRR facility high-activity drum campaign. Last Friday, NNSA approved the safety basis change reflecting a new fire barrier and drainage between the building and a nearby transformer.

On Tuesday, radiography determined that a low-activity drum (less than 0.5 Ci) contained a 2L bottle, half-full of liquid believed to be propane; the drum is two-decades old. LANL has isolated the drum, and pending safety review, intends to move the drum to an Area G permacon and to remove the bottle, possibly next week. LANL recently completed a management self-assessment of this permacon for dewatering and repackaging low-activity solidified drums, which started this week.

Plutonium Facility (TA-55): On Monday, TA-55 workers found a component cleaning glovebox had spent cleaning solution in excess of posted criticality safety limits (i.e., moderator/reflector); the safety margin was not impacted. Workers had intended to sample and remove the spent solution last week, which requires suspending room operations, but did not do so because of production schedule pressure.

Chemistry and Metallurgy Research Building Replacement Project (CMRR): NNSA and LANL have determined that CMRR's preliminary design and preliminary documented safety analysis (PDSA) have diverged from the 2006 nuclear safety strategy; furthermore, the current draft PDSA is based on an earlier version of the design, and its justification for proposed controls is incomplete. LANL subcontractors have begun to revise the design and PDSA to be consistent with the safety strategy, but achievement of this objective is not assured (site rep weeklies 4/27/07, 4/28/06, 3/17/06).

Management: LANL senior management is increasingly focused on the future and sustainability of the laboratory, which affects their level of attention to nuclear operations. At the next tier, management responsible for nuclear and high hazard operations has focused on the WCRR upgrades to meet current standards; this has been essential to driving progress. The operations management tier is largely consumed with solving daily problems, such as those reported last week for TA-55, and frequently struggles with issues involving the authorization bases, material condition, and institutional support.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 3, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 3, 2007

Federal Oversight: This week a team from the office of the Chief of Defense Nuclear Safety began their biennial review of the NNSA site office. The office of Health, Safety, and Security was also on-site this week performing scoping activities for a review tentatively scheduled for later this year.

Transuranic (TRU) Waste Operations: The federal operational readiness review (ORR) for the WCRR repackaging facility concluded this week. The review resulted in 10 pre-start and roughly 20 post-start findings. Of the pre-starts, 3 were newly identified issues and the balance stemmed from inadequately closed findings from previous reviews and contractor-identified open issues.

The review team noted the importance of facility-implemented compensatory measures, particularly the provision of a senior supervisory watch, in ensuring safe and sustainable high activity waste operations. These compensatory measures were put in place to address institutional deficiencies in key areas such as conduct of operations and engineering and in recognition that facility personnel and operators had to come to grips with a new safety basis, significant facility upgrades, approximately 100 new procedures and wholesale retraining and requalification all in the compressed time span of 7 months (site rep weeklies 6/8/07, 4/20/07, 3/16/07, 2/2/07). The ORR team lead will recommend that NNSA and LANL formalize the existing compensatory measures. This would include the development of formal criteria to be met prior to compensatory measure removal and the explicit identification of who is authorized to approve such removal.

Chemistry and Metallurgy Research Building (CMR): Pit manufacturing depends on CMR providing analytical chemistry; however, CMR is five-decades-old, is over-sized for the mission, has not been adequately maintained, and is operating to a nearly decade old safety basis. CMR's credited safety systems suffer from material condition issues, poorly understood and controlled system boundaries, and a weak technical baseline. Until about one year ago, CMR was managed jointly with the Plutonium Facility (TA-55) and was able to share TA-55 practices and procedures. CMR is now managed separately and, among its many challenges, is now having to create and maintain separate practices and procedures. Resource and staffing shortfalls, particularly in the area of engineering support, appear to be exacerbating these problems and impeding progress.

Seismic Criteria: NNSA approved the sitewide justification for continued operations resulting from the ten year update to the LANL seismic hazards assessment that concluded the site's seismic hazard is higher than previously believed (site rep weeklies 7/6/07, 4/27/07). The NNSA approval requires the laboratory to submit, by September 21st, a funded and resource-loaded project plan for completing detailed seismic analyses for nuclear and high hazard facilities by June 2009. NNSA also directed LANL to formalize and implement compensatory measures identified in the JCO for the Weapons Engineering Tritium Facility (inventory limit reductions) and the Radioactive Liquid Waste Treatment Facility (operator training for emergency response to a seismic event).

Criticality Safety: After a significant hiatus, the Nuclear Criticality Safety Committee has been formally re-chartered and held their first meeting this week. This is a positive development that could help strengthen lab-wide criticality safety by providing independent institutional oversight.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 10, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 10, 2007

Keilers was offsite at DNFSB headquarters in Washington, DC, this week.

Federal Oversight: Field activities for the Chief of Defense Nuclear Safety biennial review of the NNSA site office were largely completed this week. Oversight objectives were deemed to be met in 4 functional areas (quality assurance, criticality safety, radiation protection, and packaging and transportation). The balance of roughly 10 functional areas did not meet objectives. The review team noted significant issues associated with site office oversight of contractor training and qualification, maintenance, and safety system engineering. Other concerns identified during the review were weaknesses in site office training and qualification and inconsistent oversight of compensatory measures and corrective actions stemming from contractor gap analyses against DOE requirements.

Plutonium Facility (TA-55): A recent contractor gap analysis concluded that TA-55 fissionable material handlers and their immediate supervisors were not being certified in accordance with DOE Order 5480.20A. The LANL program lacks written examinations, oral examinations, and qualified on-the-job training instructors, all of which are required per the Order. NNSA has approved an action plan that will allow LANL to provisionally certify handlers and supervisors who are demonstrably qualified and proficient. A list of provisionally certified personnel must be submitted for site office approval by August 15th. Personnel who cannot be provisionally certified by this date must be placed on restricted duty. Provisional certifications will expire on November 15th, at which time NNSA expects an Order-compliant certification process to be developed and implemented.

This week, TA-55 also discovered several issues related to the surveillance and effectiveness of credited engineered controls. First, several monthly surveillance requirements for two safety-class confinement doors in the TA-55 basement were found to be absent from the implementing procedure. As a result, these monthly surveillances had not been performed since January 2006. This discovery resulted in a TSR violation. Additionally, during the development of a system design description, TA-55 personnel identified the existence of a pressure relief valve on the isotopic fuels impact test (IFIT) launcher whose design and installed configuration could not perform the credited safety function. The design of the existing valve and its installed set-point could not limit the launcher breach pressure to less than 550 psig, as required. These events share commonalities with issues raised during the 2005 DOE-OA review, TA-55 Director's Assessment, and recent DNFSB staff review conducted July 24-26 (see site rep weeklies 7/27/07, 6/22/07, 1/27/06, 12/9/05).

Institutional Support: LANL has recognized areas of fundamental non-compliance with DOE requirements and has begun to implement important corrective action initiatives including the Formality of Operations effort and the Safety Basis Improvement Plan. The persistence of issues such as those discussed above underscore the need for continued management attention and resource prioritization for these critical improvement initiatives. The certified fissionable material handler issue also serves to highlight that some deficiencies are significant enough to warrant near-term compensatory measures to ensure adequate protection and cannot be allowed to linger until multi-year compliance initiatives have matured enough to correct the underlying problems.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 17, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 17, 2007

Plutonium Facility (TA-55): TA-55 paused fissile material handling operations Thursday and resumed such operations Friday following NNSA approval of the provisional certification of TA-55's fissile material handlers. LANL has also recognized that TA-55 was non-compliant with its approved safety basis, which explicitly invokes the DOE Order 5480.20a certification requirements for fissile material handlers under an administrative control program. While TA-55 fissile material handlers undergo a qualification process with many of the elements appropriate for certification, that process lacked the full rigor of a formal certification process (site rep weekly 8/10/07).

Criticality Safety: While walking down TA-55 pit casting operations on Wednesday, an NNSA facility rep and a criticality safety subject matter expert discovered a discrepancy in criticality safety posting, which led to discovery of staged plutonium metal in excess of the workstation limit. Personnel evacuated the room; the LANL criticality safety group evaluated the situation; the over-mass condition was appropriately corrected; TA-55 pit operations are curtailed pending further review. This single failure appears to have had little effect on the margin of safety of this operation.

The over-mass condition arose as follows. For several years, the casting group has used a glovebox for staging that was divided into two workstations. In May, the casting group began to bring an inactive furnace in this glovebox on-line. Working with the criticality safety group, they reassigned it as a single workstation, consistent with other casting boxes, and assigned new limits. Operators were trained on the change; however, only one of the two glovebox postings was changed, and the MASS database was not updated. Recently, operators began casting in this glove-box. Per procedure, they checked MASS, the postings, the other indicators, all of which incorrectly reflected two workstations; they staged items in the glovebox consistent with those indicators and with the glovebox's prior use.

Updating workstation postings and MASS is expert-based; the site reps believe that informal change control and startup review, coupled with distraction due to production pressure, led to this workstation being incompletely updated. When checking extent of condition, TA-55 identified about two-dozen transfer (i.e., drop) boxes that are properly posted but may be susceptible to similar problems; these boxes as a class were reassigned last year as single locations but MASS still reflects two locations (site rep weekly 3/10/06). TA-55 is working toward correcting these conditions and establishing more formal protocols for declaring operability of gloveboxes and for updating criticality safety postings.

Packaging and Transportation: In two separate incidents this week, LANL discovered unexpected contamination associated with material shipments to Area G. On Tuesday, approximately 20 gallons of rainwater mixed with low activity borehole cuttings from TA-21 was released during transport. Onsite and offsite leakage areas were identified, and appropriate response action was taken to characterize the potential releases, which showed no detectable radioactivity. On Wednesday, external contamination, possibly the result of a degraded gasket, was discovered on a shipping cask containing waste from TA-48. Preparation and execution of these material moves were not conducted by the dedicated LANL packaging and transportation (P&T) group. It appears that moves not conducted or supervised by this group do not benefit from this group's level of rigor and formality in important areas, including inspection of equipment and verification of packaging certification and pedigree.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 24, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 24, 2007

Radioactive Liquid Waste Treatment Facility (RLWTF): RLWTF has shrinking storage capacity and no operating treatment capability for transuranic liquid waste transferred from TA-55 (site rep weekly 7/13/07). Acidic waste transfers have resumed and, as of Aug 22th, the acid receipt tank was 61 % full. RLWTF is reluctant to exceed 85 % full (100 % indicated) due to potential for overflow into the underground vault (WM-66); an overflow would be contained but would be difficult to clean up.

RLWTF's efforts to reduce transuranic sludge inventory and to restore treatment capability have been hampered by decreased operational supervision and engineering support. Basically, RLWTF draws upon the same limited pool of people and resources as Area G, the RANT shipping facility, and the WCRR repackaging facility; WCRR restart has drawn resources from the other facilities. Operations management has found configuration management and conduct of operations issues that are impacting progress; this includes an instance when operators continued a procedure that could not be completed as written. These issues were perhaps avoidable if the engineering and supervisory functions were fully staffed. This impacts RLWTF directly and could impact TA-55 indirectly within a few months.

Plutonium Facility (TA-55): In a step toward updating the decade-old TA-55 safety basis, NNSA has approved the laboratory's overarching TA-55 safety basis strategy and a white paper describing the proposed methodology for deriving facility leak path factors (site rep weekly 7/13/07). The LANL strategy establishes a Sept 28th target date for submitting a new safety basis. In its approval, NNSA called for control selection to be based on ICRP-30 dose conversion factors. NNSA also expressed concern with the effectiveness of parallel rather than series internal and external quality reviews, which LANL has proposed to support the aggressive schedule. Overall, the prospect of submitting a safety basis that satisfies all existing commitments by Sept 28th appears increasingly challenging.

In approving the leak path factor approach, NNSA acknowledged that the upcoming safety basis submittal will continue to rely on passive confinement. However, NNSA did reinforce the expectation that LANL conduct further investigation of additional safety class controls that could provide significant, cost effective risk reduction. NNSA directed the laboratory to identify potential upgrades to the confinement ventilation system and other systems and programs that could enhance the confinement posture of the facility as planned improvements in the forthcoming safety basis submittal.

Operationally, TA-55 resumed pit manufacturing activities last Friday. On Tuesday, an operator moved an item into a transfer (i.e., drop) box that was posted out-of-service. The posting had a handwritten annotation that it was a MASS location that was not in-service. The facility constructively critiqued the event and identified possible improvements, including: more formal processes for posting equipment out-of-service; better lab-room door posting; clearly defined room controller instructions; and, increased emphasis on pre-job walk-downs and addressing abnormal conditions.

Chemistry and Metallurgy Research Building (CMR): CMR declared a TSR violation this week upon discovering that 31 of about 600 rooms had been omitted from a surveillance procedure to inspect fire sprinkler heads. The surveillance was then performed in the 31 rooms and sprinkler heads were found to be operable. This surveillance went through CMR's procedure review and validation process and passed an independent verification review without the deficiencies being identified.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 31, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending August 31, 2007

Goff, Minnema, Plaue, and Von Holle were here reviewing corrective actions from accident reviews.

Management: LANL nuclear facility staffing requirements, including staff training and qualification, appear to need more visibility to senior management; it is unclear how these needs are being factored into NNSA and LANL priorities and into performance-based-incentives being negotiated for FY-08. In general, LANL does not appear to have leading indicators of staff populations that may be overtaxed by the extended operations that many facilities are experiencing; such metrics would not only provide advance notice of looming safety problems but also flag future staffing needs. It can easily take a year, and often much longer, to train and qualify staff to work safely in a nuclear facility.

Also, the default solution for many problems is to task the facility operations staff; however, this rarely comes with additional resources. An example may be the corrective actions from the TA-55 and CMR contaminated puncture wounds investigation; these would increase the involvement of operations staff in reviewing, approving, and monitoring work – an appropriate action but one that will be demanding to be done adequately if not sufficiently staffed. Another example may be health and safety staff who face increasing demands to review work planning documents, which decreases their operational awareness and time on the floor monitoring activities that can change frequently.

In the engineering area, staffing is critical to LANL addressing longstanding concerns about operability of safety systems and viability of safety bases controls. LANL has identified that 36 of 43 active vital safety systems have inadequate or marginal engineering coverage and that LANL needs about 41 more engineers in addition to the 52 they now have. Also, at the institution level, LANL would be well-served to track and audit progress on reconstituting the technical baseline for vital safety systems in nuclear facilities, previously estimated to be a \$7.4M effort requiring 3 to 5 years to complete (site rep weeklies 7/27/07, 7/20/07, 6/1/07, 8/4/06).

Criticality Safety: The roughly 20 existing criticality safety evaluations (CSEs) for the TA-55 vault are convoluted, occasionally contradictory, and heavily reliant on expert judgement; these are among about 300 CSEs that LANL has identified as missing, technically deficient, or having some other problem that LANL has committed to address during the next few years (site rep weekly 12/22/06).

The vault CSEs require that two vault rooms have 5% borated-polyethylene in the shelving unit doors, but LANL cannot conclusively assure that the installed material has this level of boration – an ANSI/ANS 8.21 requirement. The poly was intended only as radiation shielding. A 2002 CSE credits the boron, as well as fissile mass, spacing, shape, and reflection; a related 2001 CSE states that boron is required to keep the array sub-critical provided each storage location is loaded to the upper limits; current expert judgement is that boron is not required, but that judgement is not backed by analysis.

Based on photographs, procurement requests, and catalog data, TA-55 has no reason to believe that the configuration is other than the one analyzed; however, there is no material certification, and there are other instances where LANL procurement processes have allowed incorrect materials to be installed. LANL should consider (1) if a criticality infraction exists, in accordance with LANL ISD 130-1; (2) if a sensitivity analyses on boron's effect on safety margin is warranted, including double-batching not covered in the 2002 CSE; and (3) if compensatory measures are needed, as indicated by analysis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 7, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: B. Broderick and C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending September 7, 2007

Management: LANL is starting to plan for a possible reduction-in-force; this is driven by the large uncertainty in the FY-08 budget, ranging from a best-case flat-budget to a worse-case \$350M decrement. LANL management believes delaying action will only exacerbate the size of the action ultimately required.

Corrective Actions for Contaminated Puncture Wounds: LANL has issued institutional requirements for glovebox safety (ISD 101-28), in accordance with the corrective action plan for the TA-55 and CMR puncture wounds that occurred in January (site rep weekly 6/1/07). The ISD covers areas such as maintenance, glove integrity, ergonomics, sharps, and housekeeping.

In July, LANL revised this corrective action plan. Specifically, LANL strengthened its dependence on the upcoming revision to the integrated work management (IWM) process but weakened the action to establish a first line management (FLM) position by no longer requiring consistency. Instead, each associate director is expected to define how this position will be implemented in their organization. Weaknesses in first line management played a key role in these accidents. It appears worthwhile for LANL to consider, at least, establishing a consistent FLM implementation in LANL nuclear facilities.

Plutonium Facility (TA-55): TA-55 is planning an outage from Nov 5th through the end of the year, focused on formality of operations, configuration management, condition assessments, procedure standardization, system improvements, etc.; some limited operations would continue (Pu-238, MOX).

Criticality Safety: TA-55 is declaring a potential inadequacy of the safety analysis (PISA) and is suspending fissile material moves into two vault rooms unless the moves are reviewed by the LANL criticality safety group; material moves out of the rooms are unrestricted. While related, this is a different problem and affects different rooms than those reported last week. In this week's case, BISCO neutron shielding with 2 % boron carbide was installed in 1986; material certification was provided but has been lost; it's unclear whether or not the 1986 criticality safety evaluations credited boron. Given the uncertainty, the facility chose to enter the PISA process for these two rooms. LANL expects to have an analysis in about a week on whether the boron is required.

Transuranic Waste Operations: LANL expects to soon complete physical modifications to the RANT shipping facility to support shipping high-activity waste drums; they involve fire suppression, lightning protection, vehicle barriers, and combustible reduction. LANL has also proposed startup of the WCRR repackaging facility with compensatory measures (site rep weekly 8/3/07).

Nuclear Environmental Sites: LANL has suspended low-level waste shipments from TA-21 to Area G after discovering dripping packages were shipped on Thursday. This is similar to the event reported Aug 17th. LANL has launched but has not yet completed a formal investigation of the prior event.

Last Tuesday (8/28), a LANL subcontractor found an area with 1M dpm beta/gamma and 12k dpm alpha fixed contamination in Bayo Canyon, formerly known as TA-10. The area is being posted and controlled. TA-10 was transferred to Los Alamos County in 1967. Last month, NNSA approved downgrading TA-10 from a nuclear facility (HC-3) to radiological status based on updated analyses.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 14, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 14, 2007

Transuranic Waste Operations: This week, LANL received authorization to begin operations involving greater than 56 plutonium-equivalent curies at the WCRR repackaging facility. This is a significant step in the effort to disposition 235 drums at Area G that represent about 2% of the above ground inventory, by number, but approximately one-fourth of the above-ground inventory, by radioactivity. These drums help to drive some of the highest consequence postulated accidents at the laboratory (site rep weeklies 8/3/07, 2/2/07, and 12/8/06). The first high activity drum was processed on Thursday. Initial operations will involve lower hazard drums to allow personnel to build proficiency with new processes prior to remediating the most hazardous drums.

Physical modifications and operator training continue at the RANT shipping facility to support implementation of a safety basis change designed to facilitate timely waste disposition and improve the efficiency of shipping operations (site rep weekly 6/22/07). An independent verification review for implementation of the new safety basis controls is scheduled to begin September 24th.

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL can currently transfer and store, but not process, acidic and caustic radioactive liquid waste. On Thursday, the acidic waste tank was 81% full and storage space capacity will become operationally limiting soon (site rep weekly 7/13/07).

Transportation: On Monday, a tritium-contaminated polisher was delivered from the Target Fabrication Facility (TA-35) to the Sigma Complex (TA-3-66). Upon arrival at Sigma, the worker did not stage the polisher in a radiological control area, as required. The worker also left the facility without having the polisher surveyed by an RCT. This violated an institutional requirement developed in response to the 2005 Type B investigation involving the spread of Am-241 contamination from Sigma. This is also the latest in a series of events that indicates requirements and controls associated with material movements are not always well understood and implemented when moves are conducted by personnel outside of LANL's packaging and transportation group (site rep weekly 8/17/07).

Integrated Work Management: A revision to LANL's governing process for integrated work management is targeted to be issued by the end of this month. Among other things, this revision will require Facility Operations Directors (FOD) to review and approve integrated work documents for moderate and high hazard activities. This is positive, although staffing levels for FOD organizations will make performing this new function challenging (site rep weekly 8/31/07). IWM assessments for all functional areas are scheduled for FY08 using a tailored set of criteria developed by NNSA.

Chemical Management: An emergency management review by the DOE Office of Independent Oversight (HS-63) in 2006 concluded that LANL was not adequately managing its chemical inventory. Despite efforts to address identified deficiencies, recent walkdowns by LANL personnel found that problems related to chemical accounting and tracking persist. As a result, direction has been issued for chemical owners and responsible line managers to perform a physical inventory of chemical containers to update and validate the inventory tracking system by the end of the month. Additionally, FODs are being required to develop processes to prevent unauthorized hazardous chemicals from entering their facilities and begin implementing these processes by November 30th.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 21, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 21, 2007

Plutonium Facility (TA-55): LANL has removed the safeguarded trailers from the pad at TA-55 and is evaluating the pad's future use, possibly in support of waste operations (site rep weekly 10/28/05).

Criticality Safety: On Thursday, TA-55 paused all fissile material movements except those involving waste, shipping and receiving, and Pu-238; workers are placing operations in a safe condition for an extended period. This was a prudent response after LANL determined on Wednesday that the margin of safety for four vault rooms with extensive neutron shielding is less than previously believed under normal conditions and is incompletely understood under credible upsets, independent of the presence of neutron poison (boron). New criticality safety evaluations are being prepared for the vault. LANL will resume each unit operation after screening and confirming adequate margin exists (site rep weeklies 9/7/07, 8/31/07).

Safety Basis: At present, LANL anticipates insufficient funding in FY-08 to fully implement updated safety bases, to assess facility-specific impacts of the updated seismic spectrum, and to develop a new CMR safety basis supporting post-2010 operations. LANL nuclear facilities are now operating under a set of safety bases ranging up to 12 years old. LANL has proposed interim technical safety requirements as a stop-gap measure for CMR and intends to propose several safety bases to NNSA within the next two weeks, including TA-55, Area G, and WETF (site rep weeklies 8/3/07, 6/29/07).

Plutonium-238 Operations: TA-55 has resumed Pu-238 pyrolysis of combustible residues, which generates a safer, more chemically inert ash; however, the ash is classified as homogenous waste and lacks an approved WIPP disposal pathway; this is a long-standing problem. TA-55 also continues to successfully run bench-scale aqueous scrap recovery, in the absence of the full-scale line; this is a high-dose operation, resulting in some operators being work-restricted (site rep weekly 6/23/06).

Transuranic Waste Operations: LANL has declared a potential inadequacy in safety analysis related to Area G's lack of drum venting capability. Last Thursday, workers opened an unvented low-activity drum, counter to procedure, after removing the drum from a vented over-pack. The event was discovered on Friday when the same crew encountered another unvented drum but properly responded by stopping work. Area G has 43 unvented drums that were found and segregated last October because LANL has no approved means to vent these drums (site rep weekly 5/25/07).

LANL has made about 110 shipments to WIPP to date in FY-07, shipping about 2,600 drums and nearly 14 kCi. However, the Area G aboveground inventory (about 130 kCi now) has remained relatively static due to receipts, primarily from TA-55 and the Off-Site Source Recovery Program. Disposal of newly generated waste could be expedited by establishing waste certification capability within TA-55; this has been discussed often, but there has been little progress (site rep weekly 3/2/07).

Radioactive Liquid Waste Treatment Facility (RLWTF): RLWTF acid and caustic transuranic waste receipt tanks are 85% and 31% full, respectively; processing is expected to resume in February 2008. To support the schedule, LANL has elected to delay removing sludge from a sludge treatment tank that constitutes the facility's largest source-term until after a new drum tumbling unit is installed; this increases this effort's complexity and risk.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 28, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending September 28, 2007

Broderick was at DNFSB-headquarters in Washington D.C. this week.

Plutonium Facility (TA-55): LANL has met its milestone of fabricating 10 QA-accepted pits in FY-07.

Criticality Safety: LANL has analyzed the "as-is" condition and credible upsets in the four TA-55 vault rooms in question and has concluded that adequate margin-of-safety exists; LANL has also determined that mass or density limits need to be reduced, in at least two rooms, or an engineered solution needs to be implemented to assure can spacing. Vault fissile material moves remain secured.

This week, after reviewing criticality safety implications, TA-55 resumed a limited number of fissile material operations that improve the facility's safety posture going into the 7-week planned outage, scheduled to begin Nov 5th; examples include processing solutions, terminating furnace runs, emptying furnaces, and removing small analytical specimens. LANL is piloting a screening and resumption review/approval process for the remaining operations. Both NNSA criticality safety personnel and the recently re-established LANL criticality safety committee are conducting oversight.

Site-wide Emergency Exercise: LANL ran its annual exercise on Wednesday; it involved a simulated Pu-238 lab-room explosion in TA-55, facility evacuation, and fire department response. Some artificiality was necessary: before this exercise, lab-room personnel placed work in a safe condition, monitored, and exited to the corridors; fire-fighters and their 2 vehicles were pre-screened by security.

Some emergency capabilities were well-demonstrated (e.g., evacuation). However, two key elements were not well-demonstrated and may need attention. Specifically, these are LANL and the fire department's capabilities to (1) manage resources and address a radiological accident of this scale at TA-55, and (2) provide timely and proper response to contaminated, severely injured personnel. For example, in this exercise, the TA-55 facility incident command (FIC) was overly-crowded but needed more resources; as-is, the FIC appeared challenged. Also, the fire department response was overly-simulated, and the responders present were underutilized. The response for 2 postulated severely injured and contaminated workers was initially simulated and appeared inadequate when it did occur.

Transuranic Waste Operations: This week, LANL completed a review on implementation of new safety basis controls at the RANT shipping facility that support shipping about two-hundred high-activity waste drums to WIPP. Comment resolution is underway (site rep weeklies 9/14/07, 6/22/07).

The concern at RANT has been the building's seismic capacity, which LANL now believes to be adequate for an 800 to 1,000 year return-period earthquake (i.e., PC-2, safety-significant). While the new controls permit a factor of 8 increase in radioactive inventory inside the building, the predicted unmitigated accident consequences have dropped an order of magnitude compared to prior analyses (i.e., to 63 rem for seismic-induced fire); this is due to use of the new TRU standard (DOE STD-5506). The safety-class engineered control is the containers; the specific administrative controls at the safety-class level include radioactive and combustible inventory limits, hot-work restrictions, fueled vehicle restrictions, and separation distance to exterior drum staging. Safety-significant controls include the structure, the fire suppression system, and nearby ground-slope (site rep weekly 7/28/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 5, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 5, 2007

Plutonium Facility (TA-55): The following are noteworthy: • LANL has proposed a new TA-55 safety basis to replace the 1996 facility safety analysis report and the 2005 interim technical safety requirements; if approved, LANL estimates it will take a year to implement within the current budget. • LANL has issued a report on the June Director's Assessment; the report has about 100 findings and basically concludes that TA-55 is not supported in a manner commensurate with its national importance; that operations are not being performed to modern nuclear standards; and that work is done safely primarily due to the collaboration and experience of personnel. • The TA-55 confinement boundary was systematically extended this week to include the tunnel, which is being modified to support nuclear material radiography. • TA-55 is considering splitting the upcoming outage, with the first phase starting on Oct 14th; this takes advantage of the current pause in fissile material operations and would permit some operations in November (site rep weeklies 9/7/07, 8/24/07, 6/22/07, 6/15/07).

Criticality Safety: TA-55 has piloted the screening process on select aqueous operations and finalized the screening procedure; the pilot included two dozen operations, of which half were found to require some future action, ranging from a minor change to full evaluation. These results are consistent with the 2006 screens; the difference now is increased emphasis on identifying unprotected assumptions, on considering credible upsets more deliberately, and on documenting technical rationale more thoroughly.

TA-55 plans to screen about 500 unit operations before they resume. Near-term priorities are assay equipment, and material management & transfer systems – basically, key capabilities for inventorying and moving material around the facility. Vault operations also are a key capability to be screened early; however, the vault analyses are convoluted, and vault operations are likely to be challenging to demonstrably show to have adequate margin-of-safety with existing analyses (site rep weekly 8/31/07).

Transuranic (TRU) Waste Operations: Unrecognized unvented drums are increasingly problematic here (site rep weekly 9/21/07). On Wednesday, the WCRR repackaging facility suspended operations due to the deflagration hazard from unvented internal containers, which can have volumes up to 30 gallons; the safety basis prohibits unvented internal drums, but a purpose of the facility is to remove such drums and containers. For the interim, LANL has proposed using radiography to confirm that drums coming to WCRR have low hydrogen retention potential and can be safely remediated.

The risks associated with the aboveground TRU inventory at Area G are being reassessed under a new safety basis, expected now in November; the 2003 safety basis identified about three-dozen scenarios with unmitigated consequence between 1 and 1,800 Rem CEDE. In spite of making more than 110 shipments to WIPP in FY-07, this inventory has remained largely unchanged because of receipts of newly generated waste, principally from TA-55 (site rep weeklies 9/21/07, 1/5/07).

Due to funding issues, LANL is beginning to close down the project for a new storage and shipping facility for newly generated TRU waste. It may be appropriate for NNSA and LANL to examine certifying and shipping such waste directly from TA-55 (e.g., using the safeguarded trailer pad); this could reduce the drum handling and opening requirements for drums after they leave TA-55 and thereby reduce the load on the Area G legacy waste project (site rep weeklies 3/2/07, 2/17/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 12, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 12, 2007

Broderick was off-site this week.

Federal Oversight: A team from the DOE Office of Independent Oversight (HS-64) will be here next week, preparing for their biennial review, scheduled for Oct 29th - Nov 9th (site rep weekly 7/13/07).

Seismic Criteria: LANL has submitted a two-year \$11M project execution plan for analyzing the effects of the increased seismic spectrum on nuclear facilities; the non-nuclear scope requires 5 years and \$9M. LANL is revising the plan based on only \$0.8M available in FY-08 (site rep weekly 8/3/07).

Transuranic Waste Operations: Waste characterization operations were suspended Wednesday after a WGI employee sustained a foot injury Monday; WGI and LANL have launched a Type-B like investigation. The line of responsibility is convoluted since WGI employees work at LANL under a contract administered by the DOE-EM Carlsbad Field Office; NNSA locally provides oversight.

Resumption of the WCRR repackaging facility is imminent but will be restricted to a small number of drums that have low potential for hydrogen retention. LANL will submit a justification for continued operation with controls intended to prevent processing drums with prohibited (e.g., sealed) containers.

Plutonium Facility (TA-55): TA-55 (PF-4) starts a two-week outage Monday, Oct 15th; a second outage is planned for December. Initial focus is on walk-downs, condition assessments, and drawing updates for some safety-related systems (e.g., ventilation, instrument air, chlorine, steam, wet-vacuum, and acidic waste). Other priorities include certifying fissile material handlers, implementing an integrated plan-of-the-day, and continuing criticality safety reviews. While these initial outages may be uneven, the outage approach should lay a framework for continuously improving TA-55 infrastructure.

Chemistry and Metallurgy Research Building Replacement Project: NNSA has provided LANL comments on the rev 0 draft preliminary documented safety analysis (PDSA); NNSA and LANL expect the rev 1 draft PDSA to be ready in November and to be a substantial improvement. Separately, NNSA has directed LANL to perform a ventilation system evaluation, per the Recommendation 04-2 implementation plan, using the rev 1 draft PDSA and DOE's Jan 2006 evaluation guidance.

Radioactive Liquid Waste Treatment Facility (RLWTF): As of this week, the acidic transuranic waste receipt tank is essentially full; the caustic waste receipt tank is at 36 %. Modifications to the treatment room continue. LANL is considering starting acidic waste treatment before caustic-related modifications are finished; concurrent modification and treatment would introduce new risks.

Chemistry and Metallurgy Research Building (CMR): On Aug 31st, LANL proposed interim technical safety requirements as a stop-gap for CMR operating to an out-dated safety basis (i.e., a 1998 basis for interim operation). Among the proposed changes are a new limiting condition for operation (LCO) for hot-cell safety features (e.g., interlocks, boot-seals), a new LCO for fire doors, an improved LCO for hot-cell wing ventilation, and improved administrative controls for toxic gas control and for operations center staffing (site rep weeklies 9/21/07, 8/3/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 19, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 19, 2007

NNSA and the staff held a video-teleconference this week on projects for new TRU waste facilities.

Criticality Safety: For TA-55 vault rooms, LANL is preparing new, compliant evaluations to address deficiencies. For all the other TA-55 fissile material operations, the screening process developed two weeks ago has proven difficult to implement in a timely and effective manner and is being re-evaluated. Once operations start to resume on a larger scale, operators may become confused on which specific work stations are still paused; TA-55 has a solution for this, but it is not yet implemented.

Transuranic (TRU) Waste Operations: On Tuesday, the WCRR repackaging facility resumed work, focused on drums with low hydrogen retention potential; WCRR has remediated 24 high-activity drums since that campaign began in September. Most Area G characterization activities remain suspended; the investigation of the Oct 8th foot injury continues. The RANT facility is making thrice-weekly shipments to WIPP from the certified backlog; high-activity drums are now being shipped, increasing the total curie-contents for some payloads by a factor of four compared to prior shipments.

Radioactive Liquid Waste Treatment Facility (RLWTF) Replacement Project: The 44-year-old RLWTF is in degraded material condition and is a potential single-point-failure for nearly all LANL nuclear operations. In the last year, due to budgetary issues, the replacement project has slipped expected operational startup from mid-FY-10 to early FY-12 (site rep weeklies 2/9/07, 9/8/06).

While the replacement facility is designated Hazard Category 2 (HC-2), chemicals are the dominant hazard. A radioactive inventory about 40 % above the HC-2 threshold is postulated following a TA-55 upset; more could be done to retain that inventory in TA-55, the more robust facility. Given this inventory and the postulated accidents, LANL believes that the new facility warrants PC-2 for the seismic and wind hazards, and requires a few safety-significant systems, including the structure, fire suppression, vehicle barriers, chemical spill containment, TRU and bulk chemical tanks and piping, and TRU drums; neither active nor passive building confinement is proposed as safety-significant.

Weapons Engineering Tritium Facility: On Monday, during multiple concurrent operations to prepare a vessel to ship tritium offsite, an operator inadvertently transferred gas to the vessel before it had been fully prepared to receive the material. Portions of the vessel preparation activity are robustly proceduralized, but ancillary gas transfers rely heavily on operator experience and training. The mis-transferred material was fully contained by the vessel, and the pressure was well below the rated capacity; however, the conditions did exceed the vessel's normal service specifications. In response, the facility has taken action to increase the rigor of gas transfers by requiring an independent review of the proposed flow path and valve lineup by a second qualified operator prior to executing a transfer.

Los Alamos Neutron Science Center (LANSCE): LANSCE is nearing completion of the readiness process for dynamic experiments with plutonium, which may begin next week (site rep weekly 6/22/07).

Sigma Complex (TA-3-66): On Tuesday, a researcher in Sigma, a radiological facility, received a small burn when a chemical powder he was working with ignited. A second researcher put out the fire with an extinguisher. The fire department responded an hour later, due to communication delays mainly at the facility, and confirmed that the fire was extinguished.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 26, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending October 26, 2007

The staff held a video-teleconference with NNSA and LANL on fire protection this week.

Criticality Safety: This week, LANL submitted the required evaluation of the safety of the situation (EOSS) related to the criticality safety issues in four TA-55 vault rooms and a basement storage location. The EOSS concluded that, given their current inventories, the locations of concern had adequate safety margin under current and credible upset conditions. Material movements in these locations remain secured, and new bounding criticality safety evaluations are being prepared. In the interim, the lab may pursue a justification for continued operations (JCO) to begin removing material from these locations (site rep weeklies 10/19/07, 10/5/07, 9/28/07, 9/21/07).

The following were important developments this week in the effort to evaluate and resume other fissile material unit operations at TA-55: • LANL reaffirmed its commitment to executing the screening process essentially as originally envisioned, rather than pursuing changes that could have expedited resumption but potentially decreased the breadth and rigor of the screening process. • An individual has been assigned to perform a crucial project management role and is spearheading the development of a project plan and prioritized schedule. • Increased attention was observed on the part of NNSA and LANL management and LANL's institutional Nuclear Criticality Safety Committee.

Plutonium Facility (TA-55): Since few operations have completed the criticality screening and resumption process, the facility will extend the first phase of its planned outage through at least next week to maximize beneficial use of the programmatic downtime (site rep weekly 10/12/07).

Transuranic Waste Operations: NNSA has approved closure of 2 longstanding potential inadequacies of safety analysis (PISAs) related to Area G dome fabric and waste drum banding; NNSA withheld approval of a related Area G seismic analysis, pending near-term submittal and review of an updated Area G safety basis. The 2003 safety basis credits drum banding and waste storage domes, including structural members and fabric, as safety-class controls. LANL used guidance in the new DOE standard on safety analysis for transuranic waste facilities to justify reclassifying these two engineered controls as defense-in-depth. The new standard, DOE STD-5506, specifies damage ratios that are approved for use under various postulated accident scenarios, including those for which storage domes and drum banding were previously credited. Using the new damage ratios, the level of consequence mitigation provided by these controls was much lower than previously considered (site rep weekly 7/21/06).

Last week, LANL also submitted a JCO to address the handling and staging of the 53 existing unvented drums at Area G, as well as any that may be discovered in the future. The JCO identifies new safety-significant controls for addressing unvented drums including engineered restraints for drum lids, administrative requirements for drum isolation and segregation, and associated controls for forklift operations. Per NNSA direction, this JCO also prescribes controls to prevent prohibited container types from being shipped to the WCRR repackaging facility (site rep weekly 10/12/07).

Packaging and Transportation (P&T): This week, Department of Transportation conducted an unannounced compliance audit of LANL radioactive material P&T operations, including transuranic waste shipments to WIPP, and low specific activity and Type A shipments at LANL. No violations against LANL P&T were issued, but concerns related to subcontractor P&T operations were identified.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 2, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 2, 2007

Burnfield, Minnema, and Volgeneau were on site this week observing the DOE-HS biennial review (site rep weekly 10/12/07). Elliott was on site for a NNSA headquarters review of criticality safety.

Transuranic Waste Operations: Most Area G dome operations were suspended last Friday (10/25) due to emergent criticality safety questions; some activities not involving drum movement are resuming today. RANT waste shipments slowed in the last week due to the Area G issue and to WIPP slowing down receipts. WCRR repackaging activities were suspended Tuesday when workers found a 55 gal drum with an internal unvented 15 gal container, counter to recently imposed controls; the technicians stopped work and, following management review, placed WCRR in a safe condition.

Criticality Safety: On Oct 24th, NNSA facility reps in Area G questioned a waste drum with a non-conformance tag indicating that the contents exceeded the fissile-gram-equivalent limit (200 g); LANL management conservatively suspended operations and declared a criticality safety infraction. Out of about 20,000 above-ground drums, six exceed the limit, based on original waste generator data, and 58 exceed the limit, based on more-recent shipment certification data. LANL identified controls for high-fissile content drums in 2002, but those controls were not implemented. While mostly a legacy-drum issue, TA-55 has recently been loading drums to close to the limit, exacerbating the issue. Operations management is not always notified when such drums are found or received. Next week, Area G plans to start segregating and spacing high-fissile-content drums in accordance with criticality safety requirements.

Plutonium Facility (TA-55): TA-55 now plans to continue the outage until Jan 3rd. The criticality safety reviews continue; LANL still needs to apply more attention to planning, scheduling, and resourcing these reviews like a project to ensure that they are both timely and thorough.

On Oct 18th, NNSA directed LANL to provide an integrated priority list for TA-55 safety system upgrades identified in the recently proposed safety basis update, the Dec 2006 confinement ventilation evaluation, and the TA-55 reinvestment project. NNSA expects LANL to identify near-term funding for those upgrades necessary to protect assumptions in the safety basis accident analyses. NNSA also expects to complete its review of the safety basis by Feb 1st (site rep weeklies 10/5/07, 5/4/07).

Nuclear Infrastructure: TA-55 is probably LANL's best maintained nuclear facility, but at current funding levels, sub-standard practices persist. For example, TA-55 does not have a proactive maintenance and surveillance program for radioactive liquid systems; they rely on radiological control indicators to identify leaks after they occur. Facility personnel have spent the last week tracking down the source of one such leak for one glovebox line and discovered another leak in the process.

TA-55 lacks sufficient staffing and resources to implement such programs. The LANL Director's Assessment recognized the base issues: TA-55 operations are not being performed to modern nuclear standards, and TA-55 is not supported in a manner commensurate with its national importance. Other issues – such as the recent concerns on criticality safety, fissile material handler certification, and safety system operability – will likely recur until resolving the base issues becomes an institutional priority (site rep weeklies 10/5/07, 9/21/07, 8/31/07, 8/17/07, 7/27/07, 7/20/07, 6/22/07, 3/2/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 9, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 9, 2007

Minnema was on site this week observing the DOE-HS biennial review, which concluded this week.

Operations: LANL has consolidated several Facility Operations Director (FOD) organizations for radiological facilities and has placed explosive operations under the FOD responsible for WETF.

Transuranic (TRU) Waste Operations: Waste operations are struggling to address work control, safety basis, and formality of operations issues. Recent events include: • Last Friday, Area G's radiological-scale drum repackaging operation slightly exceeded its procedural limit (0.56 Ci); LANL has concluded that this limit is not controlled by the safety basis; however, by extrapolating this logic, Area G could repackage high-activity drums, even though Area G lacks safety-related controls for such operations; LANL intends to include a material-at-risk limit for this activity in the upcoming Area G safety basis update. • Based on guidance from the criticality safety group, Area G issued a standing order and procedure for segregating the high-fissile content drums that were reported last week. • Area G also lifted restrictions that had been imposed in response to the criticality safety infraction and resumed limited drum movements to support TRU waste shipments from RANT.

Given the rate of safety and compliance issues experienced in recent weeks, LANL management effected a safety pause of the environmental programs directorate, including TRU operations, on Wednesday. LANL management also committed to perform an external review of environmental programs operations within the next few weeks using senior-level expertise via corporate reach-back.

LANL has recognized for some time the nature of most of these issues and the need for TRU waste facilities to evolve to an efficient, disciplined, and organizationally integrated state. In 2005, LANL provided NNSA an improvement plan designed to achieve such a state. In early 2006, NNSA added this improvement plan to appropriate authorization agreements. Then, in mid-2006, LANL curtailed the plan for budgetary reasons (site rep weekly 8/18/06).

Weapons Engineering Tritium Facility (WETF): Facility management declared two Potential Inadequacies of the Safety Analysis (PISA) this week based on issues raised during the DOE-HS biennial review. One PISA related to whether glovebox pressure relief devices (known as bubblers) could perform their credited safety functions in their current configuration. The other PISA involved a surveillance requirement for the fire suppression system whose acceptance criterion may not be adequate to ensure credited system operability. WETF management issued several standing orders as an interim response to the PISAs until longer-term solutions can be investigated and developed. One standing order restricted the processing of pressurized hydrogen isotopes in gloveboxes. The other imposes a more conservative threshold value for surveillance results that would prompt appropriate actions to verify system operability.

Plutonium Facility (TA-55): TA-55 continues to struggle with infrastructure challenges. This week, TA-55 experienced issues with its paging system and chlorine detection system. Both of these safety significant systems are antiquated and require upgrades or replacement (site rep weekly 7/20/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 16, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 16, 2007

Davis, Plaue, and Tontodonato were on site this week reviewing the status of federal oversight, the contractor assurance system, plutonium and waste operations, safety bases, and formality of operations.

Engineering: LANL is struggling to put in place the configuration management, maintenance, and engineering elements to demonstrably assure that vital safety systems will adequately perform their credited safety functions. A recent LANL staffing analysis indicated that laboratory engineering staffing levels are at about half the assessed need (i.e., about 90 total are needed while 50 are in place). Present budget uncertainties impede adding engineering staff, and LANL management has made only a small number of limited-term offers. This will complicate efforts to address issues related to vital safety systems on a timely basis (ref: Board letter 10/16/07, site rep weeklies 7/27/07, 7/20/07).

Transuranic (TRU) Waste Operations: LANL has slipped proposing an updated safety basis for Area G TRU waste storage to 2nd quarter FY-08. Under the current safety basis (2003), Area G is postulated to have some of the highest-consequence accident scenarios of any LANL nuclear facility, but Area G has few engineered controls other than drums themselves. The slip delays a much-needed improvement in defining the risks and ensuring the adequacy of controls (site rep weekly 10/5/07).

Area G waste characterization operations remain largely curtailed, pending followup actions in response to the Oct 8th worker injury. Drum movements in Area G have been largely restricted to those necessary to segregate the roughly 60 suspected high-fissile content drums to address a criticality safety concern. Segregation is almost complete (site rep weeklies 11/2/07, 10/12/07).

WCRR drum repackaging operations resumed this week following implementation of tighter controls to ensure WCRR does not receive drums with a high potential for hydrogen retention. Under current restrictions, WCRR will only be able to repackage about a dozen drums. LANL intends to propose a safety basis change shortly that would expand this set. WCRR has remediated 39 high-activity drums since that campaign began in September (site rep weeklies 11/2/07, 10/26/07, 10/12/07).

Plutonium Facility (TA-55): The outage and the criticality safety reviews of unit operations at TA-55 continue; the focus of the latter has shifted to resuming plutonium machining operations; reviews related to vault storage, assay, and material transfer systems are still underway.

LANL has completed formal certification of fissile material handlers, which supercedes the provisional certifications put in place in August. LANL also intends to complete in January the integrated priority list, requested by NNSA, for safety system upgrades, including confinement ventilation and other systems identified in the recently proposed safety basis. LANL intends to use this time to improve the pedigree of data supporting the prioritization of much-needed facility investment (site rep weeklies 11/2/07, 10/26/07, 10/12/07, 8/17/07).

Chemistry and Metallurgy Research Building (CMR): CMR has entered an outage in parallel with TA-55. LANL also has proposed a safety basis strategy for post-2010 operation and expects to propose a compliant safety basis in FY-09. LANL continues to develop a risk-mitigation plan focused on reducing operational foot-print and material-at-risk (Board letter 10/23/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 23, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending November 23, 2007

Management: LANL has proposed to NNSA a plan to reduce the LANS workforce by 500 to 750 people (i.e., 6 to 9 %), first by a voluntary process and later, if needed, by involuntary selection.

Chemistry and Metallurgy Research Building Replacement Project: The site reps understand that the multi-contractor design team for the Hazard Category 2 (HC-2) nuclear facility may need to begin to phase down in January, given the continuing resolution and current budget projections; design and construction of the radiological facility (RLUOB) would likely continue. Such a phase-down would further delay the replacement facility and extend the period during which NNSA will likely depend on CMR, particularly if the design team dissolves and has to be reconstituted later (Board ltr 10/23/07).

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL has chosen to accept potential mission impacts on TA-55 and concurrently resume acid and caustic waste treatment following major RLWTF upgrades, instead of pursuing quicker, less-conservative options (site rep weekly 10/12/07). Such treatment could resume in March 2008, provided NNSA accepts LANL's proposal to confirm readiness via a LANL readiness assessment (RA) instead of operational readiness reviews (ORRs).

By the DOE startup order (O 425.1C), the readiness review decision hinges on the facility's hazard categorization: ORRs are needed for HC-2; an RA may be appropriate for HC-3. RLWTF operates under a 1995 safety basis that is based on a HC-3 designation. In 2002, NNSA questioned the HC-3 designation; subsequent authorization agreements cite that correspondence as elevating the facility to HC-2. Unlike WCRR, which was recently elevated to HC-2, RLWTF never received the upgrades to the physical plant, safety basis, procedures, and training, or the ORRs commensurate with HC-2.

The nuclear safety significance of this depends on RLWTF's radioactive inventory, which is typically half or less of the HC-2 threshold but has been postulated to exceed that threshold following certain unlikely TA-55 upsets. LANL is basing the upcoming safety basis upgrade for RLWTF on HC-3 and, last week, submitted justification for HC-3; this hazard categorization decision may also apply to the RLWTF replacement facility, which is now in preliminary design, has been designated HC-2, but does not meet some HC-2 expectations (site rep weeklies 10/19/07, 8/3/07, 10/11/02).

Plutonium Facility (TA-55): TA-55 is in the middle of a major switchgear upgrade project. Last Tuesday (11/13), to save two days of production, project personnel deviated from their design change package and unsuccessfully attempted to switch from the primary feed to the alternate feed before work was completed on the latter; they safely stopped work when the Ops Center could not confirm both feeds were operational. LANL is addressing the communication and configuration control issues.

Earlier this year, TA-55 began to process high-amerium residues under the Recommendation 94-1 stabilization program; processing accelerated in September in order to place operations in a safe state while criticality safety is being assessed. Although appropriate measures were taken to prevent large increases in whole-body dose during this campaign, extremity dose (i.e., to the hands) was not addressed. LANL determined this week that the extremity doses to some affected workers in the last two months are much higher than expected and, in one case, are at the highest level seen in a decade. LANL is reviewing the adequacy of radiological controls for this type and intensity of operation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 30, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: B. Broderick and C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending November 30, 2007

Plutonium Facility (TA-55): LANL has proposed a justification for continued operations (JCO) to allow limited material movements in 4 vault rooms and one basement storage location (site rep weekly 10/26/07). The JCO is based on analysis from recently prepared criticality safety evaluations (CSE) that reflect the actual (i.e. "as-found") material present in these locations. The JCO would allow retrieval, but not addition, of items from all locations in vault rooms A and G and from shelves and floor locations in vault rooms B and I. Retrieving items from BISCO-lined drawers in rooms B and I and the basement location are not covered in this JCO because the safety margins for some potential upsets (e.g. dropping a container onto another container during retrieval) are not evaluated in the "as-found" CSEs. However, to support an upcoming required material inventory, the JCO does allow single containers in BISCO-lined drawers to be lifted vertically, inspected, and returned to their original locations.

Activities outside these vault rooms and basement storage location continue to be dispositioned through the lab's internal review and operational release process. A LANS corporate partner is providing two much-needed additional criticality safety engineers beginning Monday. Relatedly, a second dedicated team of criticality safety engineers will begin reviewing unit operations next week. This should alleviate a process choke point and help expedite safe resumption. LANL also intends to identify a single individual to manage and coordinate all aspects of the resumption process.

Transuranic Waste Operations: The Environmental Programs directorate is developing a set of corrective actions and organizational changes to be captured in a forthcoming Deliberate Operations Project Execution Plan (PEP). This is in response to a number of recent safety and operational compliance issues and formal direction from the NNSA site office (site rep weekly 11/9/07).

An external team, consisting of senior-level managers from LANS corporate partners, completed a review this week of the formality of waste operations, and the adequacy and completeness of the draft Deliberate Operations PEP being prepared by the Environmental Programs directorate. Preliminary observations included: • funding has not been allocated to implement a new, compliant Area G safety basis, whose submittal is pending, • there is no dedicated operations funding devoted to implementing important institutional safety programs, • an organizational tolerance of substandard conditions has become normalized within the directorate. A final report is expected by December 13th.

Additionally, the WCRR repackaging facility has faced challenges in effectively implementing controls to prohibit the receipt of drums with unvented inner containers that could retain significant amounts of hydrogen. Receipt of prohibited drums has resulted in two recent Technical Safety Requirement (TSR) violations at WCRR. Last week, LANL submitted a safety basis addendum and TSR changes that address this issue by allowing unvented inner waste packages of up to 30 gallons to be breached and remediated in the WCRR glovebox. Five new TSR-level specific administrative controls have been identified to support this new activity. New controls include the use of a lid restraining device during container breaching, 30 minute cessation of glovebox operations after breaching to allow hydrogen diffusion, and ignition-source controls related to electrical grounding of unvented containers, de-energizing glovebox receptacles, and use of non-sparking tools (site rep weeklies 11/2/07, 10/5/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 7, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 7, 2007

The Board and a staff team were here this week reviewing LANL activities. On Wednesday evening, the Board conducted a public hearing and meeting to assess LANL's safety posture, including the response to suggested actions in a Board letter to the NNSA Administrator, dated Feb 1st, 2007.

Contaminated Puncture Wound Followup: LANL has completed the final dose assessment for the individual who sustained the contaminated puncture wound in January in the Chemistry and Metallurgy Research Building (site rep weekly 1/12/07). The whole-body committed effective dose has a central tendency of about 7.4 rem, which exceeds the federal annual limit for occupational exposure (5 rem, 10 CFR 835). The bone-surface committed effective dose is about 128 rem, which also exceeds the applicable federal annual limit (50 rem, 10 CFR 835). The final dose assessment was delayed because the individual elected to receive periodic chelation therapy for an extended period; the site reps understand that periodic chelation was very effective in reducing retention of plutonium and dose.

LANL's corrective actions from this event and the similar event at TA-55 have been reported (site rep weeklies 9/7/07, 8/31/07, 6/1/07). Contaminated puncture wounds are fortunately rare in the DOE complex. Further systematic review may be valuable to capture lessons learned and to guide the early decision-making process when responding to any future such events at DOE sites.

Nuclear Material Packaging: The Plutonium Facility (TA-55) reported this week that about a quarter of a 5-year-old lot of empty Hagan containers in storage had deteriorated filter gaskets. The Hagan – also referred to as the TA-55 standard container – is a robust screw-top design that is widely used for storing plutonium outside glove-box lines; it is the container-of-choice for current repackaging efforts. The gaskets in question provide the seal between the lids and the lid-filters and were expected to have a 10 to 20 year shelf-life. The deterioration seems localized to the outer edge and to not affect the sealing surfaces, indicating, so far, no loss of sealing function.

TA-54 (Area G) transuranic waste drums use the same gasket and filter design in their lids, and they have been alerted. TA-55 is evaluating quality assurance and safety basis implications using the nonconformance reporting (NCR) system and the unreviewed safety question (USQ) process.

Transuranic Waste Operations: NNSA has approved changes to the WCRR facility safety basis to allow remediation of unvented waste containers up to 30 gallons (site rep weekly 11/30/07).

Infrastructure: Last Friday, high wind and rain caused power loss and water in-leakage in several nuclear facilities, including TA-55, which appears to have significant roof bubbling and degradation.

Federal Oversight: A team from the DOE Office of Independent Oversight (HS-64) was here this week to discuss with NNSA and LANL their draft report from their biennial review. The DOE Inspector General (DOE-IG) also had a team here this week conducting a review of the DOE Material Recycle and Recovery Program, which at LANL is closely linked to nuclear material stabilization and packaging (site rep weeklies 11/9/07, 10/12/07, 4/27/07, 10/29/06).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 14, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 14, 2007

Eyler, Plaue, Shuffler, and Stokes were here this week reviewing the RLWTF replacement project.

Accident Investigation Criteria: Last week's report discussed the final dose, recently assigned, from a contaminated puncture wound that occurred in January. While the whole-body dose was less than the applicable DOE criteria for a federal investigation, the bone-surface dose exceeded the organ dose criteria (ref: DOE O 225.1A). The time lapse between the event and the dose assignment (11 months) illustrates a challenge for effectively applying the criteria and launching a timely federal investigation.

Plutonium Facility (TA-55): On Monday, two electricians working on the switchgear upgrade project shorted two wires that, unbeknownst to them, were energized. This led to a partial power loss in half the building, including partial loss of continuous air monitoring. Because of the upgrade project, the facility is not in a normal lineup; while attempting to restore power, operators took actions that led to a near-complete power loss in that half of the building, including loss of lab-room ventilation (Zone 2). Next, because of changing air pressure, ventilation in the other half of the building was secured. Throughout the event, the facility ensured primary confinement by maintaining glove-box exhaust ventilation (Zone 1); personnel also took appropriate actions, including orderly exit from the facility.

LANL review identified several problems. The integrated work documents were not at the work-site. These work documents had also not been updated to reflect that two fuses were in place, energizing these leads. The facility had learned a week earlier, during weather-related power disruptions, that these fuses were required for the operations center to have an accurate indication of the status of the electrical lineup. The intent was to pull the fuses when hazardous work was being conducted, but the hazard was not recognized for the cabinet being worked. TA-55 has suspended electrical work for this project pending improvements to supervision, configuration management, and work control.

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL now expects to restore most of the transuranic (TRU) waste treatment capability in Spring 2008 and install a new drum tumbler next summer. The safety of this operation depends, in part, on the amount and concentration of TRU waste coming from TA-55. NNSA has identified a need to confirm the adequacy of the controls at TA-55 that limit this inventory to less than the hazard category 2 (HC-2) threshold (i.e., 55 Ci, Am-241).

RLWTF Replacement Project: The replacement facility is in an "enhanced" preliminary design phase. While it has a HC-2 designation, the current design does not meet expectations for a HC-2 nuclear facility (site rep weekly 10/19/07). The HC-2 designation is driven by an assumption that the TRU treatment tanks are full of liquid that is at the waste acceptance criteria (WAC) concentrations, thereby maximizing the facility's ability to tolerate an extended shutdown of treatment operations.

However, the mission-need does not appear to require this much capacity: the operating strategy assumes TRU treatment only about 20 hours per month (i.e., 13 % utility, assuming a 40-hour week). It would also take 6 and 30 months for the facility to accumulate radioactivity to the HC-2 threshold, assuming WAC and normal concentrations, respectively. A better strategy might be to ensure the facility can minimize down-time, maximize utility, and minimize in-process inventory. This would require ensuring the adequacy of inventory-limiting controls in the generator facilities (e.g., TA-55).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 21, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 21, 2007

Transuranic Waste Operations: LANL is poised to approve resumption of characterization activities involving one real-time radiography (RTR) unit at Area G. Operations at both RTR units have been suspended since October when a subcontractor employee sustained a serious foot injury. To address judgements of need from the accident investigation, the waste characterization subcontractor revised procedures and integrated work documents to ensure adequate hazard identification and activity-level controls, strengthened conduct of operations through additional training and mentoring, and validated the adequacy of engineered safety features (site rep weekly 10/12/07).

Criticality Safety: NNSA has approved a justification for continued operations (JCO) that allows limited material movements in 4 vault rooms and a basement storage location in the Plutonium Facility (site rep weeklies 11/30/07, 9/21/07). Items may be retrieved from shelf and floor locations in the 4 rooms and drawers in the basement storage cabinet. No items may be added; retrievals and inventory activities must be conducted under a suite of temporary TSR-level controls. Retrieval of material from drawers in 2 vault rooms is not allowed since the safety margin for credible overmass upsets (i.e. material drops) for these activities has yet to be analyzed. New criticality safety evaluations (CSE) for vault rooms are in development, and most rooms are scheduled to be operating under approved, compliant CSEs by February.

Chemistry and Metallurgy Research Building (CMR): Last Friday, 3 KSL workers had nasal smears positive for uranium (192 dpm max. activity) following a CAM alarm in a Wing 4 lab room. The workers were performing D&D activities that involved removing and downsizing potentially internally-contaminated copper piping. Due to communication issues, the workers believed an RCT had lifted respirator requirements for pipe cutting. In actuality, the removed piping had not been surveyed by an RCT and was later found to have internal alpha contamination of 490k dpm.

The radiological work permit for this job requires continuous RCT coverage. However, RCTs are staffed at the 50% level at CMR on Fridays, and the RCT assigned to this job was distracted responding to other potential radiological events and trying to support other on-going work activities. This event highlights the need to augment critical support resources or to scale back operations to a level that can be adequately supported by existing resources.

Management: Approximately 430 employees will be leaving the laboratory by January 10th as part of the voluntary self-selection portion of LANL's workforce restructuring plan. Personnel in some critical functional areas (e.g. cognizant system engineers, criticality safety engineers) were barred from self-selection. However, voluntary staffing reductions were accepted in a number of categories involving key deployed personnel who support nuclear operations such as training coordinators, maintenance technicians, and nuclear work planners.

Staffing reductions in these already overtaxed areas may affect nuclear operations and the timely implementation of important on-going improvement initiatives, such as Formality of Operations. The full impacts of reduced staffing levels are still coming into focus since nuclear facility managers, who use these deployed resources, were not appraised of potential losses during the self-selection process and are only now becoming fully aware of the magnitude of the shortfalls they will be facing.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 28, 2007

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending December 28, 2007

This week, the laboratory was closed. Broderick was off-site.

Integrated Work Management (IWM): On Nov 30th, LANL issued a revised institutional IWM Procedure, IMP 300.5, which is the first substantive revision in nearly 3 years. While work control expectations are basically unchanged, IMP 300.5 now separates activities into four categories – maintenance, operations, research and development, and subcontracted work – and references separate tailored procedures/processes for each. This may lead to departures from the integrated work document (IWD) format used for the last 4 years for moderate and high hazard work, as long as the intent is met by other means, particularly for routine operations where LANL favors strengthening operating procedures per the DOE conduct of operations order (DOE O 5480.19, Chapter 16). IMP 300.5 also now suggests, rather than requires, use of the automated job hazard analysis tool.

Implementation of sound, consistent work control practices here has long been problematic; it remains to be seen if IMP 300.5 will address prior issues and bring improvement (site rep weeklies 10/31/03, 1/16/04, 5/7/04, 9/24/04, 6/3/05, 7/8/05, 11/4/05, 3/31/06, 8/18/06, 10/20/06, 3/23/07, 9/7/07, 9/14/07).

Readiness Reviews: NNSA and LANL have increased the rigor of the process for assigning the level of readiness review before startup or restart of nuclear activities. Specifically, facilities now prepare an activity description worksheet (ADW) that supplements the startup notification report (SNR) and that describes in detail each proposed new activity. The facility then formally presents the new activity to the new joint LANL-NNSA evaluation team – the JET, which meets periodically, reviews the ADWs, and formally recommends the level of review to NNSA management. The JET process, implemented in November, has begun well and has the potential to increase readiness review quality and consistency, which have been challenging here in the past (site rep weeklies 5/11/07, 12/29/06).

Nuclear Environmental Sites: In one of its first actions, the JET has proposed that NNSA and LANL conduct operational readiness reviews (ORRs) before remediation begins at TA-21 Material Disposal Area B (MDA-B). MDA-B occupies about 5.5 acres and is located on the south side of DP Road, opposite several commercial businesses. Between 1944 and 1948, LANL disposed of chemical and radioactive wastes at MDA-B in ten 40 ft wide by 12 ft deep trenches. The entire area's radioactive inventory is estimated to be about 12 Ci (i.e., about 200 g Pu-239 equivalent). LANL intends to remove the trench contents and clean up the site to meet residential requirements. Remediation is complicated by proximity of the public and the presence of small amounts of shock-sensitive chemicals. LANL expects to submit a safety basis for the remediation in January and to have an experienced subcontractor remediate MDA-B after the ORRs are conducted, expected in FY-09.

Criticality Safety: In September, due to emergent concerns with vault limits, LANL committed to reviewing criticality safety limits for 520 unit operations in the Plutonium Facility (TA-55) before the operations resumed. As of last week, per the LANL database, 218 operations have entered the review process (42 %); 188 have been accepted or have had actions approved (36 %); 64 have been recommended for release (12 %); and 32 have been released, based on criticality safety evaluations done since April 2006 (6 %). While the fraction released is low, the scope is sufficient to allow significant operations to proceed, including: sampling, staging, pyro-chemistry, casting, machining, roasting, blending, drop-box transfers, and container welding; many of these will resume next month.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 4, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 4, 2008

LANL resumed operations Wednesday, Jan 2nd.

Plutonium Facility (TA-55): TA-55 has secured from the outage, is continuing criticality safety reviews of fissile material operations, and is systematically resuming programmatic operations.

Radiological Protection: On Thursday evening, radiography of a TA-55 component began and then was immediately secured when it was discovered that one person had not exited the room. Electronic dosimetry indicates little exposure; thermoluminescent dosimeter (TLD) results are pending. TA-55 has suspended radiography until the event can be critiqued and corrective actions put in place.

Chemistry and Metallurgy Research Building (CMR): CMR is working to resolve problems with the compressed air system, which is a balance-of-plant system affecting safety-significant ventilation and safety-class fire suppression (i.e., freeze protection). Testing raised concerns that backup air compressors might not automatically start upon loss of control air. CMR is providing capability to promptly detect and manually recover from such loss by continuously manning the operations center.

Radioactive Liquid Waste Treatment Facility: Upgrades to the transuranic (TRU) waste treatment systems continue on a tight schedule; craft are working 12-hour shifts this weekend to prepare for hydro-tests. Also, the Joint Evaluation Team (JET) is proposing that TRU operations resume following a lab readiness assessment, with NNSA as the authorization authority; this is subject to NNSA accepting the facility as a hazard category 3 nuclear facility (site rep weeklies 12/14/07, 11/23/07).

Environmental and Waste Operations: On Dec 20th, LANL submitted an outline of a project execution plan (PEP) for disciplined operations in the Environmental Protection Directorate (EP); this was developed in response to NNSA direction and was motivated by 31 safety and compliance issues that arose in Area G and elsewhere last September and October (site rep weeklies 11/30/07, 11/9/07).

LANL causal analysis found that integrated safety management is not effectively implemented for EP: clear roles and responsibilities are not always defined and understood; line management responsibility for safety is not always evident; competence commensurate with responsibility has not always been established; hazard identification and control implementation are not comprehensive, including for safety bases; priorities are not balanced; safety standards and requirements are not always identified.

In November, LANL began to address these issues, including pausing operations to communicate lessons learned and management expectations. Per the outline, LANL intends to: • evaluate the 2005 improvement plan, develop detailed cost estimates, and issue the initial PEP by Jan 14th; • implement formality of operations, as funding permits, by Jan 31st; • implement integrated work planning and authorization, establish and staff a core Area G operations organization, and propose an updated Area G safety basis by Feb 29th; • identify gaps between current procedures and the safety basis by Mar 28th; • identify critical EP staff positions, establish a formal procedure review process, develop qualification standards, and train personnel on conduct of operations by Apr 7th; • implement the new Area G safety basis, at risk, in advance of NNSA approval, projected for Jun 29th; • verify safety basis implementation by Jul 31st; • walk down all EP facilities and correct safety concerns, by Sep 30th.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 11, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: B. Broderick and C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending January 11, 2008

Contaminated Puncture Wound Followup: Pursuant to 10 CFR 820.8(b), *Special Report Orders*, NNSA has directed LANL to submit a report within 90 days on the causes and the corrective actions for the CMR and TA-55 contaminated puncture wounds of January 2007. NNSA and the DOE Office of Enforcement will then evaluate the effectiveness of the actions taken (site rep weekly 12/7/07).

Federal Oversight: On December 20th, the NNSA Site Office issued the Performance Evaluation Plan (PEP) for FY08. The PEP includes performance based incentives (PBI) and for the first time defines award term measures that would allow LANS to earn a one year extension to the prime contract. Incentivized objectives for FY08 include: • manufacturing 10 diamond stamped pits; • strengthening and exercising integrated nuclear planning capabilities; • formalizing plans for CMR facility consolidation and life extension; • continuing, and in some cases accelerating, implementation of Formality of Operations; • developing system design descriptions for safety-significant systems; • performing system assessments and developing system health reports for safety-class systems; • achieving timely implementation of new safety bases, including TA-55; • improving the effectiveness of integrated work management; • completing high priority corrective actions on time.

Transuranic (TRU) Waste Operations: LANL has requested NNSA input this week on a proposed safety basis strategy for Area G; LANL intends to submit a new safety basis by the end of February and to implement the new safety basis, in parallel with NNSA review, by the end of June. Operations to be considered include not only drum characterization, storage, and movement, but also TRUPACT mobile loading, underground waste retrieval, drum repackaging, and large-item (e.g., glove-box) size reduction. LANL intends to submit a basis for interim operation (BIO), continue reliance on containers as the principal engineered control, and increase reliance on specific administrative controls (SACs), such as restrictions on vehicle access, combustibles, and drum storage array arrangement.

The expedited timing is driven by several factors. The current Area G safety basis (2003) is not fully implemented; LANL views efforts would be better spent accelerating implementation of a new safety basis. Under the current safety basis, Area G is postulated to have some of the highest-consequence accident scenarios of any LANL nuclear facility, but Area G has few engineered controls. LANL believes that a reevaluation of the accident scenario suite using the new DOE standard (DOE STD-5506) would reduce predicted unmitigated off-site consequences by an order of magnitude (i.e., to about 120 rem); while this still exceeds the DOE evaluation guideline (25 rem), it changes the perspective on the risks and the level of mitigation needed from controls. Area G needs a safety basis closely tailored to expedited TRU waste de-inventory and shipment, to support completing TRU operations by 2012 and closing Area G in 2015, as required by the New Mexico Consent Order.

Some of the more significant safety concerns in Area G involve the high-activity drums (325), the unvented drums (~53), and the unvented, high-activity drums (~10), common to both sets. LANL continues to make progress in remediating and shipping the set of 235 high-activity drums discussed in the Deputy Secretary's letter of Apr 9th, 2007. On Nov 30th, NNSA approved a justification for continued operation for movement, segregation, and storage of unvented drums. On Dec 13th, LANL proposed an Area G safety basis addendum for remotely-controlled venting of unvented drums, necessary to support the high-activity drum campaign (site rep weeklies 11/16/07, 10/26/07, 10/5/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 15, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 15, 2008

The staff had a video-teleconference with LANL and NNSA this week on the use of the MASS code.

Plutonium Facility (TA-55): On Wednesday, a deflagration occurred in two electrical cabinets in a pump house (PF-10) when an operator pressed a button to start an electrical fire pump. The cause was a natural gas leak elsewhere at TA-55; natural gas migrated down an electrical conduit to the cabinets and ignited when the button was pressed. In response, TA-55 isolated natural gas until the leak was found and patched Wednesday night. There were no injuries and no impact on nuclear operations. Visible damage is limited to bowing of the cabinet doors. TA-55 will conduct full diagnostics before returning affected equipment to service and is investigating the cause of the leak.

Criticality Safety: TA-55 has updated its criticality safety procedure to reduce operator dependency on the MASS code. TA-55 also began a pilot last week on having fissile material handlers use status boards and material transfer worksheets, in place of the traditional pegboards, to track fissile material quantities. The emphasis is on the operator confirming before material transfer that an over-mass condition will not occur at the destination or along the transfer route, which seems appropriate.

DOE Independent Oversight: On Jan 30th, The DOE Office of Independent Oversight (DOE-HS) transmitted to NNSA and LANL its final report from the biennial review conducted last November. DOE-HS was complimentary of the facility operations director (FOD) model, the formality of operations and safety basis improvement initiatives, the site chief engineer and design authority functions, the management review boards, the dashboard metrics management system, and the new Director's institutional assessment program, which is roughly analogous to the facility evaluation boards conducted at other sites. DOE-HS also pointed out continuing weaknesses in LANL implementing an effective integrated work management (IWM) process, integrating IWM with formality of operations, and ensuring that safety systems in nuclear facilities can demonstrably perform their safety functions. On the federal side, DOE-HS asserted that NNSA headquarters and site office oversight is still ineffective. DOE-HS recommendations include accelerating current improvement initiatives; addressing skill-mix issues and staffing shortfalls in engineering, safety basis, and health & safety; and expediting operability determinations and reliability improvements for nuclear facility safety systems. NNSA and LANL corrective action plans are expected in late March.

Transuranic Waste Operations: Approximately 53 unvented drums with the potential to retain flammable gas mixtures have been identified and segregated under a justification for continued operations at Area G. Last week, NNSA approved a DSA Addendum that analyzes drum deflagration scenarios associated with handling and remotely venting these types of drums. A suite of new safety-significant specific administrative controls were identified for these operations that involve: segregation and over-packs or lid restraints for unvented drums, venting only in an enclosure using non-sparking tools and drum grounding, and using only forklifts with enclosed cabs and spotters for movements. A contractor readiness assessment (RA) followed by an NNSA RA will be conducted to verify readiness to perform remote drum venting activities (site rep weeklies 1/11/08, 10/26/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 18, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: Chuck Keilers and Brett Broderick, LANL Site Representative
SUBJECT: Activity Report for Week Ending January 18, 2008

The site representatives were at DNFSB-headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 25, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 25, 2008

Environmental and Waste Operations: LANL continues to develop the project execution plan (PEP) for disciplined operations in the Environmental Protection Directorate. In a letter dated Dec. 20th, 2007, LANL projected submitting the PEP, detailed cost estimates, and an evaluation of the similar-purpose 2005 improvement plan by Jan 14th. The PEP and its effective execution are key elements in LANL resolving issues in environmental and waste operations (e.g., Area G, RLWTF) such as ineffective implementation of integrated safety management and incomplete implementation of nuclear facility safety bases (site rep weeklies 1/11/08, 1/4/08, 11/30/07, 11/9/07).

Transuranic Waste Operations: LANL has declared a technical safety requirement violation in Area G, based on having a number of unvented legacy waste boxes that date from the 1980s. The Area G safety basis requires transuranic waste containers to be vented to prevent flammable gas buildup.

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL is still targeting completing upgrades and resuming RLWTF transuranic waste treatment in March. Before resumption, LANL plans to improve conduct of operations, maintenance, and engineering for the transuranic waste treatment systems, including reconstituting the technical baseline, and to verify implementation during the LANL readiness assessment. The model for these activities is the process LANL used for RANT and WCRR last year before those facilities began the high-activity drum campaign. Separately, LANL is strengthening its case for a hazard category 3 designation, including considering controls for upstream waste generators. These are positive steps (site rep weeklies 1/4/08, 12/14/07, 11/23/07).

Waste Characterization, Reduction, and Repackaging Facility (WCRR): The WCRR glovebox does not have automatic fire suppression as required by DOE directives (DOE Order 420.1B, DOE Standard 1066). An equivalency based on compensatory measures is currently in place to support the on-going processing campaign, but is limited to operations involving waste up to 300 PE-Ci combustible equivalent. In November, LANL submitted an engineering study of potential upgrades to provide compliant automatic fire suppression to allow future processing in excess of the current limit.

The study evaluated options including gaseous systems, water-based systems, and glovebox inertion. Water-based systems were identified as the most desirable. A system using standard sprinklers was evaluated, but not selected due to concerns about discharged water breaching glovebox confinement and the resulting contamination in the event of failure. The study recommended a water mist system due to considerations involving suppression capability, effluent management and cost effectiveness. This week, the NNSA site office returned the study to the contractor without action because it had not been reviewed and approved by the appropriate Authority Having Jurisdiction prior to submission.

Chemistry and Metallurgy Research Building (CMR): CMR continues to work to resolve air compressor problems that affect the safety-significant ventilation and safety-class fire suppression systems (site rep weekly 1/4/08). During the week of Jan 11th, the facility secured from continuously manning the operations center, based on having personnel on-call via pager who can respond quickly.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 1, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 1, 2008

Gerlach was on site attending Safety Basis Academy training.

Chemistry and Metallurgy Research Building (CMR): Next week, an NNSA team will perform a detailed review of CMR processes and special nuclear material storage locations to better understand the quantity of material at risk (MAR) required to perform CMR's mission. Results of this review will inform decisions related to the acceptability of the current MAR limit for the facility.

This week, NNSA also approved a safety basis strategy for a life extension DSA that would support CMR operations beyond 2010. This DSA, scheduled for submission in FY09, is intended to be compliant with the nuclear safety management rule (10 CFR 830) and will cover enduring CMR mission activities and reflect efforts to consolidate the facility's operational and hazard footprint via wing closures, process changes, and MAR reductions. To achieve compliance, DSA development will involve a new hazard identification process and include new hazard and accident analyses. The strategy document also recognizes that most engineered controls available to be credited have known vulnerabilities and do not meet current standards. NNSA expects that all vulnerabilities will be clearly identified and analyzed and exemption requests prepared, as appropriate. The strategy document postulates a worst case unmitigated dose of less than 150 rem for the bounding accident.

In parallel with CMR life extension planning, NNSA headquarters has tasked LANL to lead an evaluation of alternatives to using CMR to support programmatic activities past 2010. Facility support options required to be evaluated include Lawrence Livermore National Laboratory's Superblock, the Nevada Test Site's Device Assembly Facility, and some combination of LANL's Plutonium Facility and the CMR Replacement Radiological Laboratory Utility Office Building.

Radiochemistry Facility (TA-48-1): On Jan. 23rd, three continuous air monitors alarmed during routine operations being performed in TA-48-1 hot cells in support of medical isotope production. Personnel evacuated appropriately, and nasals smears of affected individuals were negative.

An air compressor failure caused inlet air dampers on two exhaust fans to close, securing ventilation air flow to the hot cells. With hot cell ventilation isolated, exhaust flow from an adjacent fume hood caused the required differential pressure between the hot cells and occupied gallery area to be lost. The change in differential pressure created conditions for an air-flow reversal where contaminated air was drawn from the hot cells into the area where personnel were performing work. No alarms are installed to alert personnel of ventilation failure. Hot cell operations are suspended pending equipment repair and installation of personnel warning devices.

Radioactive Liquid Waste Treatment Facility (RLWTF): In a January 17th letter, the New Mexico Environmental Department challenged the RLWTF's exemption from the Resource Conservation and Recovery Act (RCRA) and directed NNSA and the laboratory to submit a RCRA permit application by April 30, 2008. The implications for radioactive liquid waste treatment operations are unclear.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 8, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending February 8, 2008

Bamdad, Plaue, March, McFarland, and Spatz were here reviewing the proposed TA-55 safety basis.

Environmental and Waste Operations: This week, LANL briefed the NNSA Site Office on the Project Execution Plan (PEP) for disciplined operations in the Environmental Protection Directorate; LANL expects to submit the PEP next week. Key elements include standing up an integrated project team (IPT) management structure, hiring and embedding experienced senior operations managers, reviewing procedures, evaluating behavior-based safety programs, walking down facilities and fixing unsafe conditions, submitting a new safety basis for Area G this month, and implementing that safety basis in parallel with NNSA review, which LANL projects will be completed by June.

While many of these elements are useful, the linkage between the actions and the problems to be addressed is fading; it is not clear that the elements constitute the necessary and sufficient solution set to address the issues in a timely manner, nor is it clear that adequate compensatory measures are in place to support current operations. The sense-of-urgency expressed in December has waned, and several milestones that were to be completed in January have been missed, including evaluating the curtailed 2005 improvement plan, developing detailed cost estimates, implementing formality of operations, as funding permits, and submitting the PEP. This is unfortunate, given the significance of the issues previously reported (site rep weeklies 1/11/08, 1/4/08, 11/30/07, 11/16/07, 11/9/07).

Plutonium Facility (TA-55): LANL has developed an integrated project list (IPL) that captures and prioritizes upgrades and modifications required to meet safety, infrastructure, and programmatic needs. The IPL will be continually updated, through formal change control, as new projects are identified and circumstances change. Separately, LANL has a parent-company assist team evaluating options to improve building confinement (i.e., Recommendation 04-2); results are expected in April and will be folded into the IPL (site rep weeklies 11/16/07, 11/2/07).

Weapons Engineering Tritium Facility (WETF): Last Fall, WETF placed gloveboxes in standby pending actions to ensure that pressure relief devices (i.e., bubblers) would prevent gloveboxes from exceeding their maximum allowed working pressure. On Jan 30th, NNSA approved a justification for continued operation that, coupled with hardware modifications, addresses this condition. This week, WETF verified the new controls and resumed normal glovebox operations (site rep weekly 11/9/07).

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL has an extensive double-lined low-level liquid waste collection system that includes 65 low-point vaults that would capture any leakage from the primary piping. About one-third to one-half of the vaults have detectors in alarm, indicating water intrusion. In September 2007, LANL began sampling vault water and has completed sampling from all but two of these vaults. This week, LANL reported that one vault near WCRR has water with detectable activity (i.e., 71 pCi/L); the other vaults sampled have been less-than-detectable. LANL suspects the cause is legacy contamination from WCRR and is investigating the cause.

Transuranic Waste Operations: Based on verification of controls, LANL and the Carlsbad contractor have resumed operations of the second real-time radiography unit; operations were suspended following the foot injury last October (site rep weekly 12/21/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 22, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: B. Broderick and C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending February 22, 2008

The site reps were on-travel and at DNFSB headquarters in Washington DC for most of this week. The staff also had a video-teleconference on the safety of waste and environmental programs.

Radiological Facilities: LANL has corrected conditions that caused an air-flow reversal in the Radiochemistry Laboratory (TA-48-1) hot cells and has resumed hot cell operation (site rep weekly 2/1/08). While investigating the event, LANL found safety-related weaknesses involving ventilation maintenance and testing, temporary modification control, equipment potential single-point-failures, and operator responsiveness to alarms.

These safety problems are not unique to TA-48; LANL recently found another facility with similar configuration control issues. Radiological facilities have less oversight and lower management awareness of such issues than hazard category 2 and 3 nuclear facilities. Under the formality of operations initiative, LANL is becoming increasingly aware of these problems in radiological facilities and is beginning to set consistent expectations. However, determining extent-of-condition and implementing consistent practices that ensure safe operations with high confidence will be challenging.

Criticality Safety: TA-55 has resumed operations for one vault room after completing the augmented limit review process for it; two other vault rooms are close to resumption. Vault operations were suspended last September due to margin-of-safety concerns (site rep weeklies 9/28/07, 9/21/07).

Transuranic (TRU) Waste Operations: LANL has resumed the new TRU waste facility project. The New Mexico Environmental Department has concerns on the supporting Resource Conservation and Recovery Act permit modification. Because of these concerns and funding issues, NNSA and LANL appear at-risk of a multi-year hiatus in the repackaging, storage, and shipping functions for newly generated TRU waste after the legacy waste project closes (site rep weekly 10/5/07).

Integrated Nuclear Planning: Last week, representatives from LANL, NNSA Headquarters, and the NNSA Site Office held an Integrated Nuclear Planning (INP) workshop. LANL presented their recently established Office of Integrated Nuclear Planning organization, which has secured dedicated funding and time-and-effort commitments for key individuals. Agenda items included a general discussion on how onsite INP efforts would interface with the headquarters-level Integrated Plutonium Activities Committee. Other topics included CMR life extension; impacts to TA-55 aqueous processing, specifically the Advanced Recovery and Integrated Extraction System, due to budgetary issues and headquarters sponsorship changes; and the outlook for future LANL Pu-238 operations.

Chemistry and Metallurgy Research Building (CMR): Floor storage wells in Wing 9 are equipped with a cooling water system. The cooling water system is not authorized for use and was thought to be isolated, however, water was recently discovered in the system. In response, facility personnel removed the residual water and installed robust isolation to preclude inadvertent water intrusion in the future. Water extracted from the system was sampled and found to have no detectable activity.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 29, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: B. Broderick and C. H. Keilers, Jr.

SUBJECT: Los Alamos Report for Week Ending February 29, 2008

The staff held a teleconference on the Radioactive Liquid Waste Treatment Facility Replacement.

Environmental and Waste Operations: On Tuesday (2/26), LANL announced organizational changes to strengthen operations under the Environmental Programs Directorate. LANL also paused non-essential waste operations, to allow management and the workforce to refocus on improving disciplined operations. Essential operations are continuing, particularly at the Radioactive Liquid Waste Treatment Facility (RLWTF). Some operations have been reviewed and may resume today, such as Area G waste characterization and the WCRR waste repackaging facility. Remaining operations, particularly at Area G, are scheduled to resume next week (site rep weekly 2/8/08).

This week's activities included setting expectations, evaluating material condition and operations (e.g., rounds, operations center), reviewing closure of readiness review and accident investigation findings, and conducting training on safety basis and conduct of operations. On-going actions for Area G include: • assigning a senior supervisory watch, • communicating roles and responsibilities, • achieving interim operator qualifications, • cross-walking activities and work control documentation (IWDs), • implementing select elements of formality of operations, • reviewing occurrence reports, • selecting technical safety requirements (TSRs) common to the current and proposed safety bases for accelerated implementation, and • drafting an updated disciplined operations project execution plan.

Weapons Engineering Tritium Facility (WETF): On Monday (2/25), during multiple concurrent operations, an operator inadvertently transferred approximately 3 grams of tritium to the tritium waste treatment system (TWTS). The mis-transferred material was fully contained by the TWTS.

These types of gas transfers at WETF are not proceduralized and rely heavily on operator training and experience. In response to a similar inadvertent transfer event in October, the facility developed a standing order that required an independent review of the proposed flow path and valve lineup by a second qualified operator prior to executing a gas transfer. Despite the standing order, in practice, operators were identifying and independently verifying the intended flow path, but not explicitly specifying and verifying the proper valve alignment prior to transfers. Failure to confirm the necessary valve lineup created the conditions for this event, since independent activities involving another portion of the tritium gas handling system caused the actual system configuration to be different than the operator expected. Gas transfers have been suspended until the verification process can be strengthened and confirmed to be effectively implemented (site rep weekly 10/19/07).

Chemistry and Metallurgy Research Building Replacement (CMRR): NNSA has received funding to continue design activities for the CMRR Nuclear Facility and its special equipment (e.g. gloveboxes). Recent program direction calls for the existing project scope to be validated against NNSA Complex Transformation planning in parallel with continued design. However, any future scope changes resulting from the validation effort could perturb the design and delay the project, prolonging reliance on the existing CMR facility (site rep weekly 11/23/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 7, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 7, 2008

Andersen, Bamdad, Kasdorf, Kimball, and Plaue were on site reviewing CMRR. The staff separately discussed notional TA-55 facility improvements, RLWTF influent projections, and nuclear material management and packaging. Broderick was off-site one day for a Pantex lightning protection review.

Environmental and Waste Operations: Waste operations, including Area G, resumed this week after thorough review by its strengthened operations management team. Overall, the two-week pause accomplished the objective of jump-starting improvements in disciplined operations. In the process, operational awareness increased, but also the post-resumption scope grew and schedule lengthened.

For example, LANL now anticipates that the new Area G safety basis, submitted last Friday, will be implemented by December instead of June, the prior estimate; consequently, LANL intends to verify the current safety basis is fully implemented this month, reducing the dependence on the new safety basis prior to its federal acceptance. Overall, LANL expects to issue an updated disciplined operations improvement plan next week. Risk reduction depends on timely execution of the plan while continuing operations that reduce transuranic waste inventory (site rep weeklies 2/29/08, 2/8/08).

Chemistry and Metallurgy Research Building Replacement Project (CMRR): The radiological lab construction remains on track for late FY09 beneficial occupancy. The nuclear facility preliminary design is in review; final design is expected to start in late 2008 following the records of decision for the site-wide and the programmatic environmental impact statements. Technical challenges include: structural design to accommodate higher vertical accelerations from the new seismic spectrum; glove-box automatic fire suppression; trolley penetrations through fire barriers; and the tunnel interface with PF-4. NNSA and LANL continue to evolve the path-forward on the building confinement strategy.

Plutonium Facility (TA-55): TA-55 operational tempo is increasing, as expected, following the outage. The criticality safety augmented limit reviews continue; vault operations are limited, but major manufacturing and aqueous operations are released. Separately, LANL has a notional, phased, path-forward that could substantially improve PF-4's engineered safety systems, including confinement ventilation, within a few years at reasonable cost; this is being considered for the integrated priority list.

Chemistry and Metallurgy Research Building (CMR): LANL is preparing a safety basis addendum to support the large vessel cleanout project in Wing 9 of CMR. The current project scope would remove and dispose of actinide materials in 9 legacy vessels currently staged at TA-55 (a commitment under Rec. 94-1/00-1). This would leave 5 additional vessels staged at TA-55 whose bulk materials have been largely removed but require additional remediation before they can be dispositioned. The ability to process these additional vessels in the future at the CMRR facility is unclear since the Large Vessel Handling mission is being considered for removal from the CMRR project scope.

Weapons Engineering Tritium Facility (WETF): NNSA's intent is to deinventory and downgrade WETF; deinventory without updating the safety basis had been suggested. LANL observed this week that it will take several years to deinventory. Assuming NNSA approval of the proposed safety basis this month, LANL intends to implement the new safety basis by September, thereby ensuring that on-going operations, including deinventory, occur under an up-to-date, compliant, safety basis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 14, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 14, 2008

The staff held a teleconference with LANL and NNSA to discuss Integrated Work Management.

Federal Oversight: The NNSA site office has issued a Revitalization Plan that analyzes issues and obstacles hindering performance and identifies actions designed to address these issues. The plan includes actions to augment staffing, address training deficiencies, and ensure more reasonable management span of control by creating a new assistant manager position that would oversee facility representatives (FR) and safety system oversight (SSO) engineers. Additionally, the site office recently hired two experienced individuals to serve as an FR and SSO engineer, respectively, and full qualifications have been achieved or are imminent for the site office criticality safety engineer, emergency management program manager, and two current FRs (site rep weekly 8/10/07).

Integrated Nuclear Planning (INP): This week, LANL, the NNSA site office, and NNSA headquarters held an INP workshop focused on projects for new waste facilities including the Radioactive Liquid Waste Treatment Facility Replacement (RLWTF-R), the new solid transuranic waste facility (New TRU), and the Waste Management Risk Mitigation project (Tank Farm). The workshop was productive, but highlighted a number of significant challenges facing these projects.

The TA-50 Tank Farm project was halted in April 2007 at about 75% construction due to project management and quality assurance issues. Additional evaluation of the severity and cost to disposition roughly 50 open non-conformance reports is required before a decision can be made to complete the partially constructed facility or pursue a new facility. The decision on how to proceed with this project will affect the RLWTF-R, which currently relies on the Tank Farm for low-level liquid waste influent storage. If this capability cannot be performed by the Tank Farm, then additional influent tankage must be added to the scope of the RLWTF-R project, requiring redesign work and likely prolonging reliance on the problematic existing facility. Finally, the baseline capabilities to be provided by the New TRU facility are being re-evaluated. Marginal existing facilities such as WCRR and RANT could be called upon to perform a longer-term mission than originally envisioned if certain capabilities such as repackaging or shipping are dropped from the New TRU project scope. Also, due to schedule delays in this project, a gap exists between when Area G must cease receipt of newly generated waste and when the New TRU facility will become operational. The strategy for dealing with newly generated waste during this gap is not yet clear (site rep weeklies 2/22/08, 4/13/07).

Plutonium Facility: The programmatic mission to use TA-55 aqueous processing capabilities to produce 330 kg of polished plutonium oxide by 2012 for use in the Mixed Oxide Fuel Fabrication Facility has been terminated. This provides an opportunity to use this newly available aqueous processing capacity to expedite other ongoing efforts, such as chemical stabilization of legacy materials (Rec 94-1/00-1). Current plans call for legacy residues to be repackaged into more robust storage containers by late-2010, but subsequent handling of these materials would still be required for ultimate processing and stabilization. Although it requires more up-front funding, accelerating legacy material stabilization would reduce worker exposure and risk by eliminating the need to handle these items multiple times. This approach could also increase operational flexibility by freeing up highly constrained vault space currently being consumed by these items.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 21, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 21, 2008

Criticality Safety: NNSA has approved a revised TA-55 justification for continued operation that releases Vault Room A, which is one of the four rooms identified last September as having reduced criticality safety margin. NNSA asserts that the Room A updated criticality safety evaluation bounds both normal and credible abnormal conditions. NNSA expects LANL to incorporate assumptions into the TA-55 technical safety requirements during the next safety basis update (site rep weekly 2/22/08).

Environmental and Waste Operations: LANL has issued an updated disciplined operations project execution plan that runs through December, as expected; it also includes a crosswalk of findings to corrective actions. Management operational awareness, worker sensitivity to stop-work conditions, and overall emphasis on operating to the approved safety bases have increased. Appropriate senior management attention is currently being applied (site rep weekly 3/7/08).

Transuranic Waste Operations: As of last Friday, the current high-activity drum campaign has shipped about one-third of the drums and one-fifth of the inventory (i.e., 84 of the 235 original drums, 6 kCi of 30 kCi). Also, the WCRR repackaging facility has remediated more than 150 high-activity drums and appears close to completing its part of this campaign. There are about 12 unvented, high-activity drums that will need to undergo remote venting when that operation starts up, which is expected after upcoming LANL and NNSA readiness assessments (site rep weekly 2/15/08).

Recent problems include two instances of cracked glove-box windows and one instance of a failed glove during heavy item handling at WCRR; Area G had a non-waste drum with a calibration source tip-over on a conveyor due to a software problem. LANL is appropriately addressing these events.

Chemistry and Metallurgy Research Building (CMR): As part of facility life extension, NNSA has directed LANL to take actions following up on a federal review of CMR material-at-risk last month. That review noted accomplishments but also several weaknesses, including sub-standard packaging (e.g., bagged slip-lid cans, a few bagged plastic bottles) and inappropriate crediting of ANSI and other containers that may be susceptible to failure during a fire (ref: site rep weeklies 1/6/06, 2/3/06). Key directed actions included: ensuring ownership and timely decisions on disposition of legacy materials; expediting disposal of waste and non-required legacy material; establishing a single material tracking system; moving retained legacy materials to a more robust storage location (i.e., from floor safes to the vault); revisiting the technical basis for excluding certain packaged materials from material-at-risk.

Also, last week, CMR had a contamination-release in the Wing 3 sample management room, resulting in 3 of 4 people in the room with bootie contaminations and 100k dpm maximum on the floor; airborne indicators and nasal smears were negative. CMR is reviewing waste bag-out and sample transfer practices for lessons learned.

Los Alamos Neutron Science Center (LANSCE): LANL has changed plans and is now preparing to propose that LANSCE continue to operate under the current basis for interim operation (BIO) during this year's run cycle, which runs from May through December (site rep weeklies 10/19/07, 6/22/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 28, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending March 28, 2008

The staff held a teleconference on the Radioactive Liquid Waste Treatment Facility Replacement.

Plutonium Facility (TA-55): On Thursday, TA-55 had a valid glove-box over-temperature alarm during a furnace operation that resulted in a fire department response. The facility appears to have responded appropriately and is critiquing the event and the response next week.

Weapons Engineering Tritium Facility (WETF): NNSA site office personnel toured WETF this week to evaluate the effectiveness of corrective actions taken in response to the February 25th tritium mis-transfer event. NNSA determined that the revised process for controlling tritium gas transfers still lacks sufficient rigor. As a result, WETF management has restricted the facility to one operation at a time involving the gas handling system; both recent inadvertent transfers occurred during multiple concurrent operations. Management also mandated Operations Manager involvement and concurrence prior to gas transfers (site rep weeklies 2/29/08, 10/19/07).

Radioactive Liquid Waste Treatment Facility (RLWTF): RLWTF is currently operating as a hazard category 2 nuclear facility. LANL has proposed downgrading RLWTF to hazard category 3 based on administrative limits for the aggregate material-at-risk allowed in the facility, and on controls in place upstream at the Plutonium Facility that preclude an inadvertent criticality.

The RLWTF hazard categorization decision will affect the level of readiness review required to restart transuranic liquid processing when ongoing modifications are completed. Also, both the RLWTF Replacement Project and the Waste Management Risk Mitigation (i.e., tank farm) Project currently assume hazard category 2 designations but are evaluating whether a similar categorization downgrade would be justified for their efforts (site rep weekly 11/23/07).

Formality of Operations: LANL needs to execute on a number of proposed institutional initiatives to improve worker safety and the site's overall nuclear safety posture. These principally involve four areas: safety bases, integrated work management, quality assurance, and formality of operations. The last focuses on operations, engineering, maintenance, and training.

Implementation of formality of operations appears to be slipping. Last week, LANL submitted to NNSA a revised schedule and draft criteria-for-success for a two-phased implementation of formality of operations. "Core" implementation would constitute a minimum state of compliance with applicable requirements and may include interim compensatory measures that are no longer required once "mature" implementation is achieved.

While progress is being made, the detailed scope definition needed to reliably estimate costs and establish a schedule appears to still be evolving. Developing a consensus, appropriately detailed definition of scope is complicated by the facts that the scope is large; the scope covers the broad range of LANL operations and delivered services; and the resources and staffing to achieve timely implementation clearly exceed those currently available.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 4, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 4, 2008

Keilers was off-site this week.

Plutonium Facility (TA-55): Last week, operators were conducting normal plutonium operations in two furnaces and post-modification function-testing on a third furnace that was in an abnormal configuration that heated the glove-box more than normal. In this condition, rising ambient glove-box temperature exceeded the thermal detector setpoint of 190° F, prompting an alarm. Personnel exited to the corridor and upon assessment of the situation made a conscious decision to re-enter the room to de-energize the 3 operating furnaces in the alarmed box. There was no damage or material release. The Fire Department responded.

Follow-up investigation identified issues with the configuration management of over-temperature controls for furnace operations: some interlocked over-temperature alarms were found to be disabled; over-temperature set-points were higher than necessary; and the abnormally-configured furnace was operating without one of its normally-installed temperature sensors. In response to this event, facility management has suspended all furnace operations. Identified corrective actions include evaluating, baselining, and formalizing configuration control for alarm status and set-points for all furnace controllers; and establishing formal pre-operational checks to ensure proper equipment configuration and system line-ups. Operating groups must present corrective actions to a board that will evaluate their adequacy and approve resumption (site rep weekly 3/28/08).

This week, NNSA also formally sent comments on the proposed TA-55 DSA; these require resolution before the document can be approved. NNSA noted that the current control strategy is overly-focused on minimizing the building leak path factor and raised the prospect of a condition of approval that mandates the identification of safety system upgrades and a commitment to their implementation.

Chemistry and Metallurgy Research Building (CMR): NNSA has approved a revision to the CMR interim Technical Safety Requirements (iTSR) that addresses discrepancies between the 1998 Basis for Interim Operations (BIO) and the previous set of iTSRs. The revised iTSRs credit new limiting conditions of operation and surveillance requirements for Wing 9 ventilation and a suite of hot cell controls that includes manipulator boot seals, interlocks, door enclosures, shielding, and confinement features. With the exception of one control that is not currently applicable, NNSA expects the new iTSRs to be implemented within eight months (site rep weekly 10/12/07).

Transuranic Waste Operations: Waste remediation in a Permacon at Area G is currently limited to very low activity (about 0.5 PE-Ci) operations involving solidified waste forms. LANL is proposing future activities in this Permacon that would entail prohibited item disposition for debris waste. Currently, this kind of activity would have to be performed in a glovebox at the WCRR repackaging facility. NNSA initially questioned the adequacy of proposed controls for worker protection. LANL is developing engineered confinement features that will reduce reliance on operator personnel protective equipment, such as respirators and anti-contamination clothing.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 11, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 11, 2008

Von Holle was on site this week attending an Enhanced Surveillance Campaign meeting.

Federal Oversight: This week, LASO submitted to NNSA headquarters (NA-10) the LASO-LANL interim corrective action plan developed in response to last year's DOE Office of Independent Oversight (DOE-HSS) review. LASO noted that LANL took immediate actions in response to safety system deficiencies and that this plan builds on those immediate actions. The plan will be finalized and submitted for approval after final headquarters' review (site rep weekly 2/15/08).

Also this week, in response to a Special Report Order (10 CFR 820.8(b)), LANL submitted a report to NNSA headquarters (NA-1) on the causes and the corrective actions for the CMR and TA-55 contaminated puncture wounds of January 2007. LANL observed that a formal corrective action plan is in place, many of the actions are completed, and an effectiveness evaluation has been scheduled for July and August (site rep weeklies 1/11/08, 12/14/07, 12/7/07).

Emergency Management: The postulated highest consequence nuclear accidents at LANL are fire-related. TA-55 responded appropriately to the overheated glove-box during furnace operations on Mar 27th; however, there is a clear need to improve the TA-55 fire pre-plan. Based on site rep observations of drills and exercises last year, this need may not be limited to TA-55. In addition to resources, better definition of possible responses during a fire and of criteria and timing for reentry need consideration.

LANL and the fire department's joint capability to respond to radiological events – such as multiple contaminated, injured people or a fire coupled to radioactive material – has not been well demonstrated recently. Relatedly, the 2004 baseline needs assessment is overdue for update, required every 3 years by DOE O420.1B, *Facility Safety*; also, NNSA and Los Alamos County continue to negotiate on the fire department contract (ref: Board letters 2/1/07, 5/21/05; site rep weeklies 9/28/07, 11/24/06).

Electrical Safety: An electrical disconnect box at the Radioactive Liquid Waste Treatment Facility was recently found to contain a length of metal conduit deliberately installed in place of an electrical fuse. The circuit did have over-current protection upstream, but laboratory management is appropriately treating this discovery as a serious event. The institutional electrical safety committee has been consulted and a plan is being developed to perform sampling inspections to characterize the extent of condition. In addition, this event appears to be spurring action to catalogue, prioritize and systematically address other legacy electrical code compliance issues and known deficiencies.

Los Alamos Neutron Science Center (LANSCE): LANL has proposed a set of experiments be conducted at LANSCE that involve parking a small truck with up to 200 g plutonium-equivalent within a four-sided detector bank. LANL did not propose any additional controls other than an inventory limit, although additional controls (e.g., high-quality containerization) appear warranted.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 18, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending April 18, 2008

This is Keilers's last site-rep report. It's been an education and a pleasure to serve in this capacity.

Management: LANL operations management has a fairly complete picture of LANL's nuclear safety challenges and has initiated actions to address or compensate for many challenges. This picture strongly indicates further needs for investing in infrastructure and critical staffing, reducing legacy inventories, and accelerating improvements in formality of operations, quality assurance, and integrated work management. Also, about one-fifth of the LANL workforce has received some training in human performance improvement, an area essential to LANL evolving into a high-reliability organization with attributes such as those described in DNFSB/TECH-35, December 2004.

Safety Basis: The lack of updated safety bases impedes progress. LANL now has 18 nuclear facilities, including on-site transportation and ten environmental sites, covered by nine safety bases. The median and maximum ages for the safety bases are 5 and 12 years. Technical safety requirements have had more recent changes, and safety bases configuration control has improved; the average age of the safety basis document lists is 40 days. However, it's challenging to prioritize improvements, such as confirming adequacy of engineered safety systems, without first having updated control sets, functional classifications, and safety system requirements that are derived from updated safety bases.

Transuranic Waste Operations: Area G aboveground transuranic waste inventory has decreased about 12 % since January 1st and stands at 114 kCi aboveground, including 16 kCi in OSRP sources, as of April 14th. Most of the reduction has occurred since mid-March. The rate of drum shipments has been fairly constant since the June 2006 contract transition: about 250 drums per month, averaging 6 Ci per drum. At this rate, it will take 6 to 7 years to de-inventory the aboveground waste, assuming no further waste receipts. Newly generated waste exacerbates this situation, in more ways than just adding to the inventory. For example, the TA-55 vault has about 14 kCi in Pu-238 residues that ought to be disposed, that could be compliantly packaged for disposal, but that can not meet current waste certification requirements, and therefore has no open disposition path. Improving waste disposition efficiency from the generators to WIPP would improve LANL's nuclear safety posture.

Plutonium Operations: By LANL's metric, the risk associated with non-standard packaging of plutonium in the TA-55 vault has decreased by 40 % since September 2003, primarily due to use of more robust containers. LANL now has about 1,700 non-standard containers, mostly in the TA-55 vault. LANL continues to defer chemical stabilization of some of this material because of aging infrastructure issues with the Radioactive Liquid Waste Treatment Facility and emergent mission priorities (e.g., LLNL mission transfer). Considering criticality safety, LANL has reviewed the limits for three-quarters of TA-55's fissile material operations and expects to complete these reviews within a couple of months; two-thirds of the operations examined have required improvements before resumption. LANL is also updating its criticality safety program improvement plan to reflect actions still required to achieve a program that is fully compliant with national consensus standards.

Tritium Operations: The Weapons Engineering Tritium Facility is decreasing its tritium inventory, which now stands at less than a quarter of that assumed in its 2002 safety basis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 25, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: B. Broderick

SUBJECT: Los Alamos Report for Week Ending April 25, 2008

The staff held a teleconference on the Radioactive Liquid Waste Treatment Facility Replacement.

Plutonium Facility: On Thursday, an inadequately controlled furnace operation caused a glove-box window to crack during post-maintenance testing on two clamshell-type furnaces. After testing the first furnace, an operator opened the clamshell to allow the unit to cool. Then, intending to test the second furnace, the operator inadvertently re-energized the first furnace that remained in an open configuration. This furnace, which is not interlocked to preclude operation when the clamshell is open, ran unattended for a period of time causing the glove-box window to crack due to thermal insult. Personnel de-energized the furnace when they returned to the area and observed the damage. No nuclear material was present and ambient glove-box temperature did not exceed the alarm threshold.

The facility recently underwent a deliberate review and resumption process for furnace operations in response to another inadequately controlled furnace event. Operating procedures were reviewed to ensure that robust pre-operational checks are executed prior to conducting furnace operations. Maintenance personnel typically use these operating procedures to perform post-maintenance tests, however, the maintenance group involved in Thursday's event use dedicated procedures that had not been reviewed and validated during resumption. Facility management suspended furnace operations by this maintenance group until their procedures are revised to include appropriate pre-operational checks and verifications. This event also illustrated opportunities to improve furnace interlocks and to make relationships between controller units and furnaces clearer to operators (site rep weekly 4/4/08).

Safety Basis: LANL has submitted a strategy document defining a path forward for revising the proposed Plutonium Facility DSA and TSRs based on NNSA comments. The goal is to resubmit, before July 2008, a package that includes a clear and consistently applied control selection methodology; validation of inputs and assumptions from key supporting documents (e.g. the leak path factor analysis); and incorporation of planned improvements, including any compensatory measures required until these improvements and upgrades can be implemented (site rep weekly 4/4/08).

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL has proposed downgrading the RLWTF to a hazard category 3 nuclear facility based on limiting aggregate material at risk to less than the hazard category 2 threshold specified by DOE Standard 1027. LANL intended to scale this threshold value for cemented waste drums that can be staged at the facility based on their low release fraction. The standard allows this scaling approach provided that the release fraction used is bounding. NNSA recently challenged the conservatism of the value used by LANL. As a result, the laboratory has decided to forego any scaling for the cemented waste. Revised interim TSRs that reflect this change have been resubmitted for NNSA review and approval (site rep weekly 3/28/07).

Emergency Response: Laboratory personnel held a workshop with members of the Los Alamos Fire Department (LAFD) this week to update and expand pre-response plans for a fire at the Plutonium Facility. This workshop is the latest in a series of positive steps taken by Plutonium Facility management and the LAFD to improve facility familiarization for first responders and to strengthen overall coordination between the facility and the fire department (site rep weekly 4/11/08).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 2, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick
SUBJECT: Los Alamos Report for Week Ending May 2, 2008

Plutonium Facility: During furnace operations this week, the facility experienced another glove-box thermal alarm. After assessing the situation, personnel re-entered the room and de-energized the 2 operating furnaces. The Fire Department responded and swept the area. No material was released and no equipment was damaged during this event (site rep weeklies 4/25/08, 4/4/08, 3/28/08).

The alarm occurred in the same glove-box line as the over-temperature event on March 27th. At the time of the alarm, only two of three in-line furnaces were running and they appeared to be properly configured and operating as expected. There was no obvious cause for the glove-box temperature to rise above the 190° F alarm set point. The facility has not yet determined if the alarm was valid.

In response to this event, furnace operations in this glove-box line have been suspended. New thermal detectors will be installed in this line and the removed detectors will be function tested to determine whether malfunction or drift could have caused a spurious alarm. Prior to reintroducing material, the glove-box line will be instrumented with temperature sensors and controlled diagnostic runs will be performed to better characterize the temperature profile inside the line during furnace operations.

Federal Oversight: The NNSA site office has developed and continues to refine a set of metrics to gauge and trend performance. At a high-level, these measures score performance in field oversight activities, internal issues management, contractual incentive evaluation, personnel training and qualification, and staffing. Overall, the availability of quantified performance data, which is also visible to NNSA HQ, appears to be further focusing management attention into the most critical areas.

The latest data indicates that meeting staffing goals continues to be a challenge, in part due to high turnover. Currently only 50% of required personnel are trained and qualified, although over 90% of unqualified personnel are meeting or exceeding their qualification schedule which should drive steady improvement. Assessment performance appears to represent the area most in need of improvement. Through March, the site office had completed only 8 of the 20 independent assessments that had been scheduled. Additionally, the site office has completed and documented only 36% of its commitments to observe and shadow priority contractor assessments. These shadowing activities are vital for judging the effectiveness and maturity of LANL's Contractor Assurance System and for maintaining an appropriate level of operational awareness. In response to this persistent negative trend, site office management has noticeably increased emphasis on timely completion of assessment activities.

Chemistry and Metallurgy Research Building (CMR): A CMR criticality safety officer (CSO) identified a potential infraction this week involving neptunium stored in a Wing 9 floor hole location. The criticality safety posting for this location did not identify neptunium-specific mass limits and the quantity of neptunium in the floor hole exceeded the posted limits for other isotopes. Eventually, an approved memorandum from the Nuclear Criticality Safety Group was located that provided a neptunium mass limit for this location. The material in the floor hole complied with this limit and a determination was made in consultation with the NCSG that there was no infraction. The CSO has updated the posting to include the neptunium limit and CMR management is conducting an extent of condition review to identify any other areas where postings do not explicitly cover exotic isotopes.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 9, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick
SUBJECT: Los Alamos Report for Week Ending May 9, 2008

Transuranic Waste Operations: TSR implementation at Area G is being validated as part of the ongoing Deliberate Operations Project Execution Plan. This effort has identified issues with the safety-significant lightning protection systems (LPS) that service waste storage domes. Issues include poorly defined inspection requirements to verify system function, failure to take necessary action when required measurements could not be taken or did not meet acceptance criteria, and use of inspection procedures that had not been properly evaluated against the facility safety basis.

Subsequent evaluation of the LPS also identified a condition that could compromise the system's ability to perform its safety function. Metal bodies within a certain distance of the LPS are required to be electrically bonded to the system to prevent uncontrolled arcing. Unbonded metallic waste drums are staged in proximity to LPS components in some domes. A follow-up critique will be held next week to determine whether proximate metal drums impact LPS function, how to respond if they do, and whether discovery of this situation constitutes a Potential Inadequacy of the Safety Analysis.

Radioactive Liquid Waste Treatment Facility (RLWTF): NNSA has approved downgrading the RLWTF to hazard category 3. This downgrade is based on controlling the material-at-risk such that aggregate facility inventory remains less than 55 americium-equivalent curies.

Work continues to complete the campaign to upgrade process equipment to restore the transuranic liquid waste processing capability that has been down since 2006. Physical modifications are largely complete. Limited startup testing using clean water will likely begin next week, although a leaking tank connection must be addressed before full system testing can be performed. Given the downgrade to hazard category 3, the proposed level of review to authorize restart of transuranic liquid waste processing will be a laboratory readiness assessment (site rep weeklies 4/25/08, 3/28/08, 1/25/08).

Chemistry and Metallurgy Research Building (CMR): A criticality safety infraction was declared this week when about 40g of uranium in solution was identified in a Wing 4 location that did not have explicit limits for solutions. This infraction was discovered as part of the extent of condition review prompted by the neptunium posting concern reported last week. The infraction was graded as the lowest severity level (i.e. Level 5) meaning that although criticality safety controls were not implemented as intended, there was no actual impact to the safety margin (site rep weekly 5/2/08).

Emergency Management: The NNSA site office recently issued a letter communicating concerns with the laboratory's progress in improving its Emergency Management Program. Noted concerns include an inadequate number of trained and qualified Emergency Managers and a lack of up-to-date Emergency Preparedness Hazards Assessments for hazardous material facilities. The letter directs LANL to provide a formal response with details on how these issues will be addressed within 15 days.

Weapons Engineering Tritium Facility (WETF): LANL has proposed conducting a series of experiments using gram-quantity samples of plutonium at WETF. The current WETF DSA does not allow weapons-grade plutonium in the facility. LANL has submitted a set of DSA page changes that analyze the new hazards and credit additional controls for the proposed activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 16, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: Brett Broderick, LANL Site Representative
SUBJECT: Activity Report for Week Ending May 16, 2008

The site representatives were at DNFSB-headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 23, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 23, 2008

Davis reported for duty this week as a site representative.

Contractor Assurance: So far this year, Director's Assessments for the Chemistry and Metallurgy Research Building, Transuranic Waste Operations, and the WCRR repackaging facility have been canceled and the outlook for future Director's Assessments is uncertain. These assessments provide independent, broad-based review of compliance with DOE requirements and appear to represent an important component of the laboratory's overall assessment program that supports the Contractor Assurance System. Discontinuing Director's Assessments would eliminate a valuable tool to help facility management identify deficient or non-compliant areas that require action and to help senior management maintain awareness of conditions and issues associated with operating nuclear facilities.

Chemistry and Metallurgy Research Building (CMR): Representatives from NNSA Headquarters, the NNSA site office, and LANL participated in an integrated nuclear planning workshop this week on the strategy for authorizing and operating CMR beyond 2010 when its current safety basis expires.

Analytical chemistry and material characterization (ACMC) activities and the Bolas Grande project to remediate legacy containment vessels were endorsed as the primary CMR mission activities to receive support for post-2010 operations. Future ACMC would be conducted inside a smaller facility footprint and MAR-intensive operations like sample preparation and Pu-238 activities would be moved into the Plutonium Facility to reduce hazards at CMR. Very preliminary results from the evolving DSA conservatively calculate a worst case unmitigated offsite dose consequence from a seismically-induced fire to be approximately 53 rem. The unmitigated consequence from this bounding accident may be reduced as the analysis matures; however, existing and currently anticipated controls provide little mitigation due to the seismic fragility of CMR. Potential upgrades are being reevaluated and reprioritized based on the extent to which they support anticipated DSA controls and facilitate eventual DSA implementation. Major seismic upgrades are not envisioned.

Transuranic Waste Operations: This week, LANL completed shipment of the last vented drums associated with the ongoing high-activity drum campaign. This is an important step in the direction of overall hazard reduction at the site. Of the approximately 235 original high-activity drums in the current campaign, only 11 unvented drums remain. These drums require remote venting of potentially flammable headspace gas prior to ultimate disposition. A remote drum venting capability has been established at Area G and is undergoing startup activities. A laboratory readiness assessment (RA) began this week to be followed by an NNSA RA prior to authorization to begin hot operations.

Plutonium Facility: This week, an NNSA RA team completed their field activities for startup of the interim radiography project at TA-55. This project provides a 6 MeV radiography capability in a tunnel connected to the TA-55 basement. The RA team has identified numerous potential pre-start findings. Some preliminary issues involve the facility control system, procedures, job hazard analyses and the potential impact of construction modifications on the safety class confinement structure. The RA team plans to complete their review and provide an outbrief to LASO and LANS management next week (site rep weeklies 6/15/07, 3/23/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 30, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director

FROM: B. Broderick and R.T. Davis

SUBJECT: Los Alamos Report for Week Ending May 30, 2008

The staff held a teleconference on the Radioactive Liquid Waste Treatment Facility Replacement.

Formality of Operations: NNSA has accepted formal implementation criteria for each of the four elements of Formality of Operations (operations, engineering, maintenance, and training). Implementation is divided into two phases, 'core' and 'mature', and separate criteria are provided for each phase. Core implementation represents minimum compliance with DOE requirements and mature implementation correlates to the establishment of robust programs that incorporate best practices. Once a nuclear facility declares it has implemented any of the four elements of Formality of Operations, an independent review will be performed using the accepted implementation criteria.

Facility Operations Directors have revised their Formality of Operations implementation schedules based on the new criteria. The most significant schedule impacts were for conduct of engineering, where core implementation criteria now include additional requirements for technical baseline reconstitution and control, and the performance of operability determinations for credited controls. The last facility scheduled to achieve core implementation of conduct of engineering is the Plutonium Facility in mid-2011. This date is driven by the time needed to develop or revise technical baseline documentation such as piping and instrumentation diagrams; however, the Plutonium Facility expects to meet all other conduct of engineering requirements by late-2009 (site rep weekly 3/28/08).

Chemistry and Metallurgy Research Building (CMR): Last week, LANL declared a Potential Inadequacy in the Safety Analysis (PISA) at CMR based on inconsistencies between the Interim Technical Safety Requirements (ITSRs) and National Fire Protection Association (NFPA) 72, *National Fire Alarm Code*. These inconsistencies involve ITSR surveillances to ensure adequate backup power and audibility for the CMR Fire Alarm System and were identified by an NNSA site office Safety System Oversight assessment. CMR facility management promulgated a standing order to address these issues pending evaluation via the unreviewed safety question (USQ) process.

Transuranic Waste Operations: As previously reported, Area G personnel were evaluating a number of issues related to the safety-significant lightning protection system (LPS). One concern related to whether LPSs protecting all Area G waste storage domes complied with NFPA 780 *Standard for Implementation of Lightning Protection Systems*, as required, due to unbonded metallic waste drums staged in proximity to LPS components in some domes. Additionally, the required in-service inspection for this system is vague, referencing NFPA 780 rather than providing more detailed and explicit inspection criteria to verify system function. Ultimately, LANL declared a PISA. As part of the evaluation triggered by the PISA process, LANL recognized a need to evaluate potential impacts to the WCRR repackaging and RANT shipping facilities that have similarly vague in-service inspections for their credited LPSs (site rep weekly 5/9/08).

Safety Basis: For the case discussed above, NNSA site office interaction with LANL was required prior to PISA declaration. In addition, the PISA was declared several weeks after issues were initially identified. Timely and conservative PISA evaluations are an important part of the overall USQ process for managing and maintaining the safety envelope for operating nuclear facilities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 6, 2008

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 6, 2008

Worker Safety: Recently, personnel have sustained a series of hand and finger injuries while performing work in nuclear and radiological facilities. In one case, a KSL worker severed the tip of his finger while performing circuit breaker maintenance at the Sigma complex (TA-3-66). In two other cases, one at the WCRR repackaging facility and the other at a TA-48 radiochemistry laboratory (RC-1), hand wounds were sustained inside radiological areas. While subsequent wound counts were negative, these near-miss events had the potential to cause radiological uptakes and share some similarities to the January 2007 contaminated puncture wounds sustained at TA-55 and CMR.

Contractor Assurance: Preliminary activities supporting an institutional review of integrated work, safety, and security management systems began this week. Part of the scope of this review will be to evaluate the first line manager program that was established as a corrective action from the Type B-like investigation of the 2007 contaminated puncture wound events mentioned above.

The contaminated puncture wound accident investigation produced a judgment of need to provide supervision that exerts positive control and surveillance over all workers, work activities, and work space. First line manager (FLM) positions were created to satisfy this judgment of need. Although each laboratory directorate established FLMs, actual implementation of this program diverged sharply across the site in terms of the rigor of the selection and vetting process, training and indoctrination received by FLMs, and ultimate FLM span of control. Given the drastic differences in FLM implementation, insights into the effectiveness of first line supervision at all nuclear and radiological facilities appear particularly relevant and timely in light of recent operational and potential precursor events, including the worker injuries described above (site rep weeklies 1/11/08, 9/7/07, and 1/19/07).

Plutonium Facility: This week, the NNSA Readiness Assessment (RA) team provided an outbrief to site office and lab management on their review of the interim radiography project at TA-55. The RA team did not recommend that the authorization authority (NA-10) approve startup of this activity based on the number of findings (18 pre-start and 22 post-start findings were presented at the outbrief), questions about the adequacy of the preceding laboratory RA, and the potential for additional issues to be identified. The site office plans to review the final report and provide a recommendation to NA-10 on how to proceed (site rep weeklies 6/6/08, 6/15/07, and 3/23/07).

Federal Oversight: The NNSA site office updated its Facility Representative (FR) staffing plan. The new plan does not change the overall FR staffing requirement of 14, but does adjust individual facility allocations and identifies the need to provide a level of FR coverage for a number of radiological and high hazard facilities that did not previously have the benefit of a dedicated NNSA field presence. Additional facilities receiving FR coverage under the updated plan include the DARHT hydrodynamic test facility, the LANSCE accelerator facility, TA-48 radiochemistry facilities, the Sigma Complex, the Beryllium Technology Facility, the High Magnetic Field Laboratory, and the Health Research Laboratory. The updated plan also provides more focused FR coverage for the Chemistry and Metallurgy Research Building and the Weapons Engineering Tritium Facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 13, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 13, 2008

Board members Bader and Winokur and staff members Minnema, Plaue, and Tontodonato were onsite this week.

High Explosive Operations: On Wednesday, programmatic activities at TA-39 caused a wildland fire that required partial activation of the Emergency Operations Center to coordinate a fire fighting response. The fire was controlled and response activities concluded Thursday evening. Approximately 12 acres were burned. No nuclear or radiological facilities were directly threatened.

The fire resulted from performance testing of a powder gun that will ultimately be fielded at the Nevada Test Site to support the dynamic plutonium experiments program. Forensic investigation of the exact cause of the failure that initiated the fire is ongoing. However, preliminary information suggests that an explosively-driven valve was breached during the test. The resultant loss of system containment allowed hot reaction-product gases to vent from the gun assembly, which ignited nearby vegetation. Firing site personnel alerted the Fire Department and attempted to suppress the incipient fire until wind conditions caused the fire to grow beyond their capacity to safely respond.

During the pre-shot review, this gun test was deemed to be 'contained' and was therefore allowed to be performed under conditions that would not have been allowed for an uncontained shot (i.e. high winds, proximate vegetative fuel loading, and lack of pre-staged fire response apparatus). Development of more conservative criteria for what constitute contained shots appears warranted.

Transuranic Waste Operations: LANL management has decided to re-staff and re-perform the recently executed laboratory readiness assessment for remote drum venting operations at Area G. This decision was based on concerns about the adequacy of the initial review and lessons learned from the Plutonium Facility interim radiography readiness review process (site rep weekly 6/6/08).

Weapons Engineering Tritium Facility (WETF): NNSA has approved hazard analysis and TSR changes to support a series of experiments that will expose gram-quantity plutonium coupons to tritium gas at WETF. The plutonium samples will be enclosed in a leak-tight test cell designed to interface with the WETF tritium gas handling system through a filtered manifold. Rupture disks are provided to ensure the test cell does not experience pressures exceeding its capacity. In addition, a protective fixture is provided for the test cell assembly to prevent mechanical failures resulting from drops during transit. New TSR controls to support these experiments include a facility MAR limit of 24 g of weapons-grade plutonium where 8 g are allowed in the process line with the balance staged in robust containers. The test cell assembly and its protective fixture are also credited as design features.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 20, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 20, 2008

Davis was offsite this week.

Weapons Facilities: A follow-up critique was held on emergency response actions associated with last week's wildland fire caused by powder gun operations at TA-39. Firing site personnel became aware of a problem almost immediately subsequent to the test shot and when the brush fire was observed, personnel took action to fight it. After 5 to 10 minutes of unsuccessful attempts to control the spreading brush fire, a series of calls was initiated through 2 separate firing site access control centers that ultimately resulted in Fire Department notification and response (site rep weekly 6/13/08).

In response to this event, the laboratory has implemented compensatory measures for high explosive operations at firing sites and initiated a review of shot authorization and control prescription processes. Under the compensatory measures, senior management authorization is required to conduct any shot under particularly hazardous fire conditions (i.e. 'Red Flags') and expectations have been strengthened for having pre-staged Fire Department coverage for shots.

Last week a fire also occurred in the Weapons Material Laboratory (TA-16-304) during an electric oven operation to destroy a plastic classified part. When checking the status of the evolution, a technician observed a small fire inside the oven. Upon discovery, the technician called the oven operator who reported back to TA-16-304 from another facility. By this time, the oven fire had grown too large to be safely suppressed by facility personnel. The individuals exited the facility and notified the Fire Department, which responded and extinguished the fire.

Emergency Response: The events above appear to highlight an opportunity for improvement in communicating and implementing the expectation to call 911 upon discovery of a fire and prior to personnel initiating any actions to fight or control fires themselves.

Radioactive Liquid Waste Treatment Facility (RLWTF): This week, the RLWTF declared an iTSR violation. The iTSR requires that a monthly combustible loading surveillance be performed using approved criteria. These criteria are provided via memo by the Fire Protection Engineering group. In November 2007, a new memo with more restrictive combustible loading surveillance criteria was issued; however, this iTSR-affecting criteria change was not formally controlled. The engineer who regularly performs this surveillance was not aware that the criteria had changed and since the implementing procedure did not explicitly specify the combustible loading criteria, the surveillance continued to be performed using the less restrictive criteria from the superseded memo. Upon discovery, the facility revised the implementing procedure and re-performed the surveillance. A limiting condition of operation was entered and excess combustibles were removed from RLWTF.

Training: The NNSA site office conditionally approved a Training Implementation Matrix (TIM) for the RLWTF. Development of compliant and approvable TIMs has been a persistent challenge for LANL, so approval of the RLWTF TIM is a significant step toward establishing compliance with DOE training requirements and can be used as a model for generating other nuclear facility TIMs.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 27, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 27, 2008

Davis was off site this week. The staff held a video-teleconference on software quality assurance.

Plutonium Facility: Last week, facility personnel discovered that safety-class seismic bracing had been improperly removed from a glove box. The bracing is credited to prevent glove box toppling and release of Pu-238-doped material in a seismic event. Given this discovery, LANL declared a TSR-violation based on a significant breakdown of the configuration management program.

The credited bracing was removed for a glove box modification project that began over a year ago under a design change package (DCP), but was never completed. When the project was abandoned, the bracing was not reinstalled and the DCP remained open. The glove box was being used to stage weapons-grade Pu when the discrepant condition was found. An annual in-service inspection (ISI) of the glove box and its bracing was performed in May 2008; however, a scientist who did not use a required system drawing when performing the ISI, inappropriately noted the bracing as satisfactory.

In response to this event, the facility operations director (FOD) suspended Pu-238 and Pu-238-doped material operations until appropriate portions of the ISI could be re-performed to verify credited bracing was intact and operable on other glove boxes. Personnel performing ISIs must now be approved by the FOD. An action plan to remove the weapons-grade Pu from the affected glove box is in development. Finally, facility personnel are working on a process to screen and triage the hundreds of legacy DCPs that remain open to identify and address other latent vulnerabilities.

Site-wide Seismic Hazards: LANL recently submitted for NNSA concurrence a revised Project Execution Plan (PEP) for the SAFER project designed to evaluate the impacts of increased site-specific seismic hazards on operating facilities. In the new PEP, LANL commits to evaluate all structures, systems, and components (SSC) credited to perform seismic safety functions in nuclear facilities before the existing site-wide justification for continued operations expires in June 2009. However, the detailed list of SSCs to be evaluated under SAFER does not clearly capture all SSCs credited to perform seismic safety functions (e.g. WCRR drum lift fixture). NNSA review is ongoing.

In terms of progress, modeling activities are underway for the Plutonium Facility and an important kickoff meeting was held this week to discuss the proposed evaluation methodology and acceptance criteria with the expert panel that will provide peer review for SAFER analyses and conclusions.

Transuranic Waste Operations: Last week, the NNSA site office formally disapproved the Area G BIO and TSR package submitted in February 2008. Issues with the control selection strategy and control definitions contributed to the NNSA review team judgment that the proposed TSR set was not adequate or effective.

A key facet of the ongoing Deliberate Operations Project Execution Plan to improve the safety of Area G operations is accelerated implementation of new or enhanced controls from a modern and complaint safety basis. LANL and NNSA personnel met subsequent to the disapproval decision to discuss which controls were still suitable for continuing accelerated implementation efforts.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 4, 2008

MEMORANDUM FOR: T. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 4, 2008

Plutonium Facility: While attempting to open a taped slip-lid container using a screwdriver, an operator inadvertently punctured the glove-box glove and an interior glove. The screwdriver did not lacerate the operator's hand but resulted in 15,000 dpm alpha contamination on his innermost cotton glove liner. Subsequent discussions with the operator indicated that the taped container did not have tabs (as expected) to facilitate removing the tape nor was the screwdriver the appropriate tool for tape removal. The operator was also not aware of previous similar incidents (e.g., the January 2007 contaminated puncture wounds) or the associated corrective actions. Based on this information, facility management met with first line managers to discuss methods of ensuring that lessons learned and corrective actions are adequately disseminated down to the worker level. In addition, the facility is using this event to re-emphasize the use of appropriate tools and the need to pause work when unexpected conditions are identified (site rep weeklies 1/19/07, 1/12/07).

Last week, LANL submitted to NNSA an updated path forward on Board Recommendation 2004-2. The proposed approach is supported by an external independent review performed by URS. The submitted plan identifies a series of analyses and upgrades intended to be executed over the next 5 years to achieve safety class active confinement ventilation, safety class fire suppression (credited for operational vice seismically-induced fires), and inerted environments for high-risk glove-boxes. LANL asserts that these collective upgrades should effectively reduce mitigated off-site doses to well below the DOE evaluation guideline. This would represent a significant improvement in the safety posture of the Plutonium Facility; however, the funding sources for many key upgrades are currently identified as 'to be determined.' The ultimate recommended end state in the external URS report is the addition of robust safety class sand filters. The current submittal defers a decision on sand filters and does not specify the time frame for a decision on whether they will be pursued.

Chemistry and Metallurgy Research Building (CMR): Last Friday, CMR management declared a Potential Inadequacy in the Safety Analysis based on a newly identified failure mode for the facility vault during a seismic event. The current safety basis credits the vault structure to prevent the release of nuclear material during bounding accidents, including a seismic event. Hence, material in the vault is excluded from counting against the facility material-at-risk (MAR) limit. During development of the new Documented Safety Analysis, safety basis analysts identified that failure of one of the CMR wings could potentially collapse the vault roof structure. In response, CMR management issued a standing order requiring the vault inventory be included as part of the overall facility MAR limit. This week, CMR management declared this issue an Unreviewed Safety Question and is developing a Justification for Continued Operations (JCO) for NNSA approval. The JCO will likely formalize vault inventory inclusion in facility MAR calculations.

Federal Oversight: As a part of the corrective actions from the Chief of Defense Nuclear Safety review in 2007, site office personnel held the first series of Operational Awareness briefings this week. These briefings, which will be held quarterly, provide management with a status of key on-going initiatives (e.g. Formality of Operations) and nuclear facility conditions. They also provide field personnel with an additional forum to surface issues that warrant management attention.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 11, 2008

MEMORANDUM FOR: T. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 11, 2008

Bamdad and Kimball were onsite this week attending a workshop on safety-class controls for the Chemistry and Metallurgy Research Building Replacement. Laake, Martin and Von Holle were also onsite to discuss LANL activities related to unresolved electrostatic discharge issues at Pantex.

Chemistry and Metallurgy Research Building Replacement (CMRR): This week, the Integrated Safety Committee held a workshop to discuss the preliminary safety basis accident scenarios and selection of safety-class controls. For the facility fire scenarios, the preliminary safety-class controls include fire barriers, fire suppression and aspects of the material container. The facility structure is also credited as safety-class for several accident scenarios including seismic events. The facility active ventilation system is identified as safety-significant (performance category-3) and will provide additional mitigation for most of the postulated accident scenarios. The CMRR project team plans to submit an updated Preliminary Documented Safety Analysis to the site office in November.

Plutonium Facility: As noted on June 6th, the NNSA Readiness Assessment (RA) team did not recommend approval to startup interim radiography operations (IRO). Upon reviewing the RA team final report, the site office provided recommendations to the authorization authority (NA-10), including: LANL will perform an independent review of IRO design changes (focused on extent-of-condition for engineering issues); and LANL will demonstrate the IRO procedure to an experienced NNSA team. Upon successful completion, the site office will recommend startup to NA-10.

Transuranic Waste Operations: LANL has formally responded to NNSA's disapproval of the Area G safety basis. The LANL response does not challenge the disapproval, but does highlight areas of technical disagreement that need to be addressed prior to re-submittal. One significant area of disagreement is whether the control selection strategy and control definitions comply with relevant directives, such as DOE-STD-3009 and DOE-STD-5506. LANL also expressed confusion over NNSA issues related to controls for remote drum venting operations since proposed controls are nearly identical to recently approved controls that serve as the basis for the ongoing startup activities discussed below. To promote better communication on these types of issues during future safety basis development cycles, LANL proposes establishing "phase-gate" meetings with NNSA at strategic intervals during the preparation of all future safety bases (site rep weekly 6/27/08).

In June, LANL management decided to re-perform the laboratory RA for remote drum venting operations at Area G based on lessons learned from the IRO startup and concerns about the adequacy of the review. Last week, the subsequent laboratory RA team concluded their review. The team identified several pre-start and post-start findings but concluded that the remote drum venting operations could be safely performed following causal analysis and closure of pre-start findings. Notably, the team identified a post-start finding that the Integrated Safety Management System did not appear effective based on a number of issues identified during the review.

Readiness: In response to issues related to the IRO and remote drum venting readiness activities, the site office formally directed LANL to report on the adequacy of staffing for readiness preparation and review functions, as well as, lessons learned and corrective actions stemming from these activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 18, 2008

MEMORANDUM FOR: T. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 18, 2008

Plutonium Facility: Over the last few weeks, there have been a number of equipment and performance problems associated with the Facility Control System (FCS). Based on the persistence and severity of these problems, facility management placed the Plutonium Facility in standby (Mode 2). The FCS is a safety-significant system that provides facility monitoring and control capabilities, and serves as a support system for the facility's active confinement ventilation. Recent FCS problems are related to the communication infrastructure for the system and were resulting in numerous failures each day. When the FCS is declared inoperable, the facility enters a limiting condition of operation requiring verification of differential pressure provided by facility ventilation every 15 minutes and restoration of the FCS within 24 hours. In response, facility personnel performed troubleshooting and maintenance that involved removing some FCS hardware from service to reduce the load on the communication network. These actions restored system operability and allowed the facility to resume normal operations late this week. Limited system upgrades to replace servers and software are in progress; however, persistent failures and system age seem to indicate problems with FCS reliability.

While the FCS was inoperable, facility management identified two mission-critical material shipments that could not be performed while the facility was in standby mode. A temporary safety basis modification was submitted to the site office to allow these activities to be performed with compensatory measures (mainly ventilation monitoring). The site office approved the safety basis change but did not issue a safety evaluation report or formal memo documenting the approval basis.

Glovebox Safety: Recently, LANL began an effectiveness evaluation of the corrective actions associated with the puncture wounds that resulted in internal contamination in early-2007. The review plan includes evaluation of institutional actions but will maintain a specific focus on the safety of glovebox operations. The evaluation team is developing guidance cards with specific lines of inquiry for line managers who will perform parts of the evaluation. In addition, the institutional evaluation team will perform an independent verification for a subset of the line management evaluations. Field activities are expected to be complete in August. Several other reviews of glove box safety issues are also on-going, including a management evaluation of glove breaches over the last two years and an assessment of the Plutonium Facility glove integrity program.

Site-wide Fire Protection: Recently, a rupture in the system that supplies fire water to TA-21 caused a release of nearly 4 million gallons of water. Although this failure impacted fire protection and response capabilities for facilities in TA-21, the laboratory did not receive timely notification of the problem. In response, LANL is formalizing protocols with Los Alamos County for timely notification when abnormalities are detected that could affect LANL systems. TA-21-specific compensatory measures have also been developed that include performing more frequent system surveillances and establishing a limited remote monitoring and alarm capability. LANL management indicated that the need for additional site-wide action will be evaluated. Understanding and addressing the site-wide extent of condition appears warranted to increase confidence that a failure elsewhere in the site-wide water supply system that could impact credited fire suppression systems in nuclear facilities would be identified quickly to allow the affected facilities to take appropriate response actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 25, 2008

MEMORANDUM FOR: T. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 25, 2008

Staff members March and Galaska were on site this week for a fire protection review.

Federal Oversight: Based in part on a perceived inconsistency in the condition of facility equipment and LANS metrics related to equipment maintenance, the NNSA site office performed a “for cause” review of deferred maintenance. The review team recently completed their review and concluded that LANL does not maintain equipment to prevent damage, loss or deterioration. Key preliminary findings included: LANL’s deferred maintenance definition is not consistent with DOE’s definition and is not managed, adequately funded and worked off; equipment condition assessments are not performed as required; preventive, corrective and predictive maintenance are not used to ensure equipment availability; and LANL is not adequately informing NNSA of significant risks related to equipment condition. A final report is expected by the end of July.

Criticality Safety: This week, the site office performed an assessment of the LANL Nuclear Criticality Safety Program focused on aspects of field implementation at the Plutonium Facility, Chemistry and Metallurgy Research Building and Area G. The assessment was conducted using some of the same personnel from the 2005 review that prompted development of the Program Improvement Plan to establish a compliant, standards-based criticality safety program. During the outbrief, the team observed that significant progress has been made since 2005 on priority issues. They also observed a need for increased criticality safety group presence on the operating floor in facilities and better-defined roles, responsibilities, and interface expectations for criticality safety officers.

Plutonium Facility: The site office has approved changes to a justification for continued operations (JCO) to reconfigure material in two Plutonium Facility vault rooms to bring them into compliance with new interim criticality safety evaluations (CSE). The new CSEs specify a lower limit for material staged in floor locations and a new limit for storage drawers in which no more than one location per drawer may contain metal items. Some floor locations and many drawers in the affected vault rooms are not currently in compliance with the new limits. These locations will be remediated using controls identified in the revised JCO. Once this material reconfiguration is effected, the four vault rooms that prompted concerns about reduced criticality safety margins last September will all be in compliance with new, standards-based CSEs (site rep weeklies 3/21/08, 12/21/07, 9/21/07, 9/7/07).

Hoisting and Rigging: Recent crane incidents prompted an institutional task team review of cranes, hoists and rigging equipment. Based on a sampling review, the task team concluded that despite prior corrective actions, laboratory processes remain inadequate to ensure that all in-service cranes, hoists and rigging have been inspected and maintained in accordance with applicable requirements. In response, LANL management issued a set of aggressive compensatory measures including direction to equipment-owning organizations to immediately check inspection and maintenance records and lock and tag any deficient equipment out of service. Facility Operations Directors (FOD) were also instructed, within two weeks, to perform independent verification walkdowns to ensure deficient equipment has been locked and tagged out of service. FOD verification walkdowns are ongoing and this process has already resulted in dozens of cranes being removed from service.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 1, 2008

MEMORANDUM FOR: T. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 1, 2008

Weapon Response: LANL recently issued a weapon response related to an electrostatic discharge issue that has caused W76 operations at the Pantex Plant to be suspended since May. Based on the high-priority nature of this issue, LANL dedicated all available subject matter experts to the weapon response development effort. As a result, no truly independent electrostatic discharge experts were available to participate in the peer review of the technical results, as required by LANL's approved procedure. Due to the highly aggressive schedule imposed on this activity, LANL did not engage LLNL to provide independent technical reviewers. NNSA has reviewed LANL's weapon response process to ensure that it satisfies applicable requirements from DOE-NA-STD-3016-2006; however, the NNSA site office does not currently perform oversight of weapon response execution to ensure that LANL is appropriately implementing its approved process.

Plutonium Facility: LANL recently completed switchgear upgrades at the Plutonium Facility to provide automatic diesel generator startup and supply to key facility loads (e.g., ventilation). Although the facility receives power from multiple feeds, electrical transients were causing numerous loss of power events that impacted facility safety systems and facility operation. Facility management is also pursuing additional improvements including better transfer capabilities between available power feeds and improving the facility power factor (site rep weekly 12/15/06).

In accordance with the recommended site office path forward for interim radiography operations (IRO), facility personnel attempted to demonstrate the operating procedure in early-July. Numerous issues were identified during the evolution prompting the site office to request another demonstration be performed. On Friday, facility personnel successfully demonstrated execution of the revised procedure. As required by the path forward, LANL also completed an independent review of IRO design changes and provided a report to the site office (site rep weekly 7/22/08, 6/6/08).

Transuranic Waste Operations: NNSA is poised to begin a readiness assessment on Monday for remote drum venting operations at Area G. The remote drum venting capability is required to remediate the remaining 11 of roughly 235 original drums in the high activity drum campaign.

LANL is also nearing completion of readiness preparation activities for restarting the transuranic waste processing capability at the Radioactive Liquid Waste Treatment Facility. Physical upgrades and modifications are complete and have undergone startup testing, a strengthened operations center has been established, and operators are being trained to an updated set of procedures.

Site-wide Fire Protection: In response to a recent event and questions raised concerning the fire water supply for defense nuclear facilities, LANL has initiated a comprehensive review of the site-wide water distribution system. The review is evaluating the supply tanks and distribution system for single point failures, alarm capabilities (e.g., tank low-level), system maintenance/surveillance and requirements for notifying nuclear facilities of degraded system conditions. Based on the preliminary review to-date, LANL has taken action to ensure receipt of low-level alarms for an Area G water tank that was previously not monitored by the laboratory (site rep weekly 7/18/08).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 8, 2008

MEMORANDUM FOR: T. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 8, 2008

Broderick was at the Sandia National Laboratory Tuesday and Wednesday attending the nuclear weapons complex lightning protection committee meetings.

Chemistry and Metallurgy Research Building (CMR): Earlier this year, NNSA approved a revision to the CMR interim Technical Safety Requirements (iTSRs) to address discrepancies between the 1998 Basis for Interim Operations and the previous set of iTSRs. This week, LANL completed an Implementation Verification Review to confirm these controls are incorporated into appropriate facility procedures and that facility personnel are knowledgeable of the controls and requirements. The review team observed field performance of all of the revised or new surveillance requirements. Several pre-implementation findings were identified associated with procedural issues. The team concluded that upon resolution of the pre-implementation findings, CMR will be able to safely implement the revised iTSRs. LANL also continues to develop a Documented Safety Analysis to support post-2010 operations at CMR (site rep weeklies 5/23/08, 4/4/08).

Transuranic Waste Operations: On Friday, the NNSA Readiness Assessment (RA) team completed their review of remote drum venting operations at Area G and provided an outbrief to site office and contractor management. The following five pre-start issues were identified:

- hazards and controls have not been completely identified in some cases
- implementation of controls was inadequate in a few cases
- performance of dose estimates and As Low As Reasonably Achievable review have not been completed
- the startup plan is inconsistent concerning plans for drum processing
- procedures can't be performed as written in some cases

Three post-start issues were identified associated with hoisting and rigging, conduct of operations and training. The RA team recommends that the startup authority approve remote drum venting operations following closure of the pre-starts findings and development of corrective actions for the post-start findings (site rep weekly 8/1/08)

Plutonium Facility: Last week, LANL submitted a draft of the Documented Safety Analysis (DSA) and Technical Safety Requirements (TSRs) to the site office for review. This draft is noted to be 99% complete and was provided to the site office for verification that the technical content of these documents meets NNSA expectations.

Federal Oversight: This week, LANL responded to a site office request to assure resources are adequate such that nuclear facilities can be operated in a safe, secure and environmentally-compliant manner. LANL has established an Infrastructure Validation Team to meet this objective. The team will evaluate and improve the LANL process for prioritization, planning, budgeting and execution. Deliverables from this team will include a definition of facility safe operating requirements, facility planning/execution guidance and a maintenance program improvement action plan. The validation team plans to complete their deliverables and reviews by mid-September.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 15, 2008

MEMORANDUM FOR: T. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 15, 2008

Broderick was off-site this week.

Plutonium Facility: On Wednesday, an operator punctured his hand while performing a stainless steel cutting operation in a glovebox. Operators and radiological control personnel took appropriate action to respond to the injury and transport the injured operator to the on-site Occupational Medical Facility. Initial wound counts were positive; however, subsequent medical efforts were able to remove a small metal sliver and significantly reduce the wound contamination.

Based on initial investigation, the Integrated Work Document (IWD) included the puncture hazard and controls were identified. In particular, the IWD required use of puncture resistant gloves for this activity. The pre-job brief included a discussion of this hazard and controls. In addition to the first line manager and other operators in the area, two members from the effectiveness evaluation team for the January 2007 contaminated puncture wound corrective actions were in the area and observing the activity. Personnel observing the activity noted that the procedure and controls (including puncture resistant gloves) were followed by the operator. This particular cutting operation with stainless steel creates a rough edge that appears to have breached the operator's glove. Based on the injury sustained by the operator, it appears that the controls identified may not be adequate.

All machining activities at the Plutonium Facility have been suspended pending causal analysis of this event. In addition, the Director has requested that a formal investigation be performed.

Radioactive Liquid Waste: The Waste Management Risk Mitigation Project (TA-50 Tank Farm), which involved construction of a new Hazard Category 2 pump house and tank facility, was intended to increase the low-activity liquid waste storage and address concerns that arose during the Cerro Grande fire. This project was halted in April 2007 at about 75% construction completion due to project management and quality assurance issues. This week, the site office approved a LANL recommendation to complete this project as a radiological facility to provide low-activity liquid storage during emergency conditions. This decision may impact plans to use the TA-50 Tank Farm for influent storage for the Radioactive Liquid Waste Treatment Facility Replacement Project.

Federal Oversight: LANL recently responded to a site office request to report on the status of staffing for readiness preparation and lessons learned from issues associated with the Interim Radiography and Remote Drum Venting readiness activities. The LANL report notes that current readiness staffing is not adequate to perform their mission and additional resources have been requested for Fiscal Year-2009. LANL is also establishing formal qualification training for Laboratory Readiness Assessment team leaders, core review team members and readiness review coordinators. The report also identifies numerous lessons learned from the Interim Radiography and Remote Drum Venting readiness activities for planning, scoping, performance and other areas (site rep weekly 7/11/08).

Plutonium Facility: On Friday, the startup authority (NA-10) approved startup of Interim Radiography at the Plutonium Facility (site rep weeklies 8/1/08, 7/11/08, 6/6/08, 5/23/08).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 22, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 22, 2008

Contaminated Puncture Wound: The Deputy Laboratory Director has formally chartered a team to investigate the glovebox glove puncture event that occurred last Wednesday and resulted in a contaminated wound. The scope of the investigation, which began this week, is to collect relevant facts and determine the causes of the glove puncture. The charter also specifically tasks the team to evaluate the following: • adequacy of activity hazard analysis and control identification for glovebox operations, • work controls and procedures relevant to the associated activity, and • training and qualification of the involved workers on relevant work controls and procedures. A causal analysis and accompanying report are due to the Deputy Director by September 25th and corrective actions to address the causal factors are due by October 24th (site rep weekly 8/15/08).

Plutonium Facility: In response to the puncture event, Plutonium Facility management suspended all metal cutting and machining operations. The facility has developed a review and release process to ensure controlled resumption of suspended operations. For a given operation, the process evaluates the types of metals involved, the potential for sharp pieces or turnings to be produced, and the extent to which cut pieces or turnings need to be handled. Operations that pose a puncture risk based on these factors are subjected to more rigorous review requirements, including a process walkdown involving appropriate safety subject matter experts. Multiple levels of management approval are required to release an operation once it has been reviewed and controls have been verified as adequate. Few of the roughly 80 suspended metal cutting and machining operations have been released to date.

Formality of Operations: This week, the NNSA site office approved revised Formality of Operations implementation schedules based on previously approved criteria that define 'core' and 'mature' levels of implementation. The approval memo emphasizes that the objective for FY09 is to substantially achieve core implementation for conduct of operations, engineering, and maintenance in LANL nuclear facilities. Most of the newly approved implementation dates support this objective. For those that do not, (e.g. conduct of engineering at the Plutonium Facility and the Weapons Engineering Tritium Facility) the site office directed LANL to provide, for separate concurrence, further definition of what specific elements will not be implemented by the end of FY09.

Implementation dates for conduct of training generally lag those for other functional areas and in many cases stretch into FY10. For FY09, the site office identifies an expectation for LANL to establish qualification cards for key positions, cross-walk personnel training and experience against the qualification cards, and identify and implement compensatory measures, as needed.

In the approval memo, NNSA acknowledges that there is residual risk associated with the current state of incomplete Formality of Operations implementation, but contends that substantial progress has occurred and risk has decreased over time. The site office asserts that further efforts to analyze gaps and characterize residual risk would only detract from on-going implementation efforts. Based on the above, NNSA formally accepts the residual risk and states its belief that attention should remain focused on implementation (site rep weeklies 5/30/08, 8/10/07, 6/15/07, 3/28/07, 2/2/07).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 29, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 29, 2008

Contaminated Puncture Wound: The laboratory accident investigation continued this week, with the team focused on personnel and management interviews and timeline development. In addition to the on-going investigation, a number of other efforts to evaluate glovebox safety and glovebox glove integrity are progressing. These include the LANL effectiveness evaluation for corrective actions associated with the January 2007 puncture wounds; an evaluation of glovebox glove breaches at the Plutonium Facility; and an assessment of Glovebox Glove Integrity Program implementation. These parallel efforts are being performed under the auspices of several different laboratory organizations, but appear to be analyzing different facets of the same problem. As such, upon completion of these activities, there may be value in having a single entity collect and review the results, consolidate identified issues, and coordinate an integrated response (site rep weeklies 8/22/08, 8/15/08, 7/18/08).

Chemistry and Metallurgy Research Building (CMR): This week, LANL submitted a revised program execution plan (PEP) to support operations in CMR beyond 2010. The revised PEP incorporates decisions and actions stemming from the May integrated nuclear planning workshop devoted to CMR. The programmatic baseline has been revised and de-scoped to reflect only Confinement Vessel Disposition Project work in Wing 9 through 2013 and analytical chemistry and material characterization work continuing in Wings 5 and 7 until the CMR Replacement facility is operational. Relatively few changes were made to the list of priority safety system upgrades, however, deferred breaker maintenance and enhancements related to the fire alarm and fire suppression systems have been added. The revised PEP also explicitly identifies risk mitigation through relocation of non-essential personnel to more robust facilities (site rep weekly 5/23/08).

NNSA Headquarters (NA-10) recently issued a letter directing the site office to prepare an exit plan, due in mid-December, to transition activities out of CMR 'as soon as practicable.' It is not yet clear the extent to which this direction will alter the baseline path forward codified in the revised PEP.

Transuranic Waste Operations: On Wednesday, the site office authorized startup of remote drum venting operations at Area G. The authorization memo requires LANL to demonstrate operational maturity by venting five low-activity drums without needing process or procedural changes prior to addressing any of the 11 high-activity drums that require venting to complete the current campaign.

Plutonium Facility: Interim Radiography Operations (IRO) were also authorized to begin this week. The IRO capability eliminates hazards associated with shipping pits round-trip to LLNL for high-energy radiography and significantly improves the efficiency of LANL pit manufacturing.

Readiness: Startup authorization for the new capabilities discussed above is positive in that both help to reduce or eliminate hazards. However, the NNSA site office perceives that LANL prematurely declared implementation in both cases, based on readiness assessment findings that some procedures could not be performed as written and some controls were not fully implemented. The site office has set an expectation for LANL to systematically review these experiences, identify lessons learned, and track corrective actions to closure. LANL has identified and begun executing steps to prevent recurrence (site rep weeklies 8/15/08, 8/8/08, 8/1/08, 7/11/08, 6/13/08, 6/6/08).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 5, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 5, 2008

Radioactive Liquid Waste Treatment Facility (RLWTF): On Saturday (8/30), an equipment malfunction following a maintenance evolution at the Chemistry and Metallurgy Research Building (CMR) caused an inadvertent discharge from the chilled water system at a rate of approximately 60 gallons per minute. This water soon began draining into a line leading to the low-level waste influent collection tanks at RLWTF. The 75,000 gal primary collection tank level began rising at a rate of 5% an hour. The computerized monitoring and control system initiated an automated alarm call-out, an operator reported to RLWTF, assessed the situation and contacted plant management. There was initial confusion about the source of the influent water and early efforts to isolate the upstream source focused on the TA-48 radiochemistry facility rather than CMR. By the time the upstream source was isolated and the plant was put into operation to begin processing liquid, around 300 gallons overflowed from the primary tank and was pumped into a 100,000 gal secondary tank, already approximately 75% full of legacy material. About 50,000 gal of total influent was received.

This event appears to be prompting a comprehensive evaluation of instrumentation both at RLWTF and at generator facilities to ensure that equipment needed for timely and accurate identification of abnormal conditions is appropriately maintained and calibrated. There also appears to be heightened attention and urgency for remediating legacy material held in the secondary tank to increase margin. This remediation requires offsite vendor support and has been delayed due to funding issues.

Transuranic Waste Operations: Waste storage domes in Area G are equipped with lightning protection systems (LPS) credited with reducing the frequency of lightning-induced fires that can impact transuranic waste. Performance and in-service inspection criteria for the safety-significant LPSs are vague and simply reference NFPA 780. A potential inadequacy of the safety analysis (PISA) was declared in May based on metal waste drums staged within the code-mandated arc-flash exclusion area around LPS components. Three months later, this condition was determined to be a positive unreviewed safety question (USQ). Affected domes are in the process of being remediated and operational restrictions are in place for domes where drums remain inside the exclusion area.

This week, the results of an NNSA site office safety system oversight review of the LPS were briefed to Area G management. The review highlighted a number of other code compliance issues, including lack of surge suppression for domes and ground resistance readings for some LPSs that were outside the acceptable range. Many, if not all, of these issues had been previously identified by LANL. After reassessing the known information and deficiencies, Area G management declared a TSR violation. The initial PISA declaration, identification of the positive USQ, and the recent declaration of a TSR violation were all prompted by NNSA engagement (site rep weeklies 5/30/08, 5/9/08).

Weapons Engineering Tritium Facility (WETF): This week, WETF declared a PISA related to the safety-significant fire suppression system. A TSR for this system requires sprinkler heads to have a maximum temperature rating of 100° C. Two sprinkler heads that are collocated with heated equipment have a rating of 141° C. The higher rating of these sprinklers is necessary to comply with NFPA code requirements, but is not consistent with the language in the TSR.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 12, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 12, 2008

Plaue, Shackelford, and Roscetti were onsite this week to review safety system design, functionality and maintenance. Plaue also reviewed nuclear materials management topics.

Transuranic Waste Operations: Subsequent to the TSR violation declared last week related to the Area G lightning protection system (LPS), management suspended all operations not directly involved with establishing the required arc flash exclusion area around LPS components. This week, LANL submitted and NNSA approved a formal recovery plan that defines the conditions and compensatory measures needed to allow the resumption of unrestricted transuranic waste operations in Area G. Prior to the suspension of operations last Friday, LANL had identified a situation that constituted a positive unreviewed safety question but had continued performing some limited operations without any formal approval by NNSA. The recovery plan provided a mechanism to gain this formal approval. The recovery plan also identifies longer-term actions to revise the current safety basis to permanently address LPS issues by December 1, 2008. Authorization to operate under the recovery plan expires on December 31, 2008 (site rep weeklies 9/5/08, 5/30/08, 5/9/08).

Site-Wide Seismic Hazards: The site office recently approved a revised Project Execution Plan (PEP) for the SAFER project, which will evaluate the impacts of increased site-specific seismic hazards. The approval letter requested LANL to revise the PEP to include evaluation of the Weapons Engineering Tritium Facility and ensure that all structures, systems and components (SSCs) credited to perform a seismic safety function are included. The site office's approval of the site-wide Justification for Continued Operations (JCO) that addresses the increased seismic hazard for LANL facilities requires LANL to complete the SAFER project for nuclear and high-hazard non-nuclear facilities by June 2009. The site office also requested quarterly updates on the SAFER project.

Last week, the SAFER project team presented the initial results of their evaluation of the Plutonium Facility to the peer review team. These results indicate that the vertical acceleration of the facility floor may be much larger than expected and would have a significant impact on SSCs that perform a seismic safety function. Based on these results, LANL plans to pursue a probabilistic analysis for the Plutonium Facility and revisit conservatisms in the Probabilistic Seismic Hazard Analysis.

As noted on July 4th, LANL also recently declared an unreviewed safety question and prepared a JCO based on a seismic vulnerability identified for the Chemical and Metallurgy Research (CMR) Facility main vault. While the site office concurs with the compensatory measure (including the vault material-at-risk against the overall facility safety basis limits), the JCO was not approved because a limited duration was not identified for the JCO (site rep weekly 6/27/08).

Integrated Nuclear Planning: This week, LANL, the NNSA site office and NNSA Headquarters held a workshop to discuss plutonium infrastructure and waste management at LANL including capabilities, vulnerabilities, programs and projects. The workshop highlighted the significant challenges at LANL to adequately support safe operations at existing aging facilities while also achieving progress on several projects to replace or upgrade these facilities (e.g., CMR Replacement, Radioactive Liquid Waste Treatment Facility Replacement and new Transuranic Waste Facility).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 19, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 19, 2008

Plutonium Facility: This week facility personnel recognized a condition where 3 uncredited containers bearing Pu-238 were incompletely submerged in the vault water bath. Compensatory measures stemming from a 2006 potential inadequacy of the safety analysis (PISA) and positive unviewed safety question (USQ) require uncredited containers to be fully submerged. The control derived to ensure this condition is satisfied relates to maintaining the water in the vault water bath above a certain level. However, the water level control was based on assumptions associated with container dimensions and storage configurations. These assumptions were not protected and operators were not aware that certain container sizes and storage configurations could defeat the intent of the control. As a result, the water level was maintained at the prescribed level, but this did not prevent uncredited containers from being stored in an incompletely submerged state. Upon recognition of this situation, facility management remediated the condition, reengaged the PISA process and revised the ineffective compensatory measures associated with the legacy PISA.

TRU Waste Operations: Waste storage dome door restraints are credited for preventing doors from becoming wind-borne missiles that can impact transuranic waste drums. The approved Area G DSA states that door restraints will survive wind speeds up to 96 mph. A calculation performed in 2007 determined that the door restraints will fail at lower wind speeds than identified in the DSA. The new information provided by this calculation does not appear to have been formally captured and acted on at the time. A cognizant system engineer rediscovered this information while conducting a vital safety system assessment (VSSA) of the door restraints. As a result, management declared a PISA.

The SER approving the current Area G DSA mandates that vehicle barriers be credited as safety-significant and comply with NRC NUREG 6190 to prevent errant vehicles from impacting waste storage domes. A 2005 NNSA site office assessment identified that the vehicle barriers could not meet NUREG 6190. This prompted a TSR violation and the institution of compensatory measures that have evolved and been strengthened several times since 2005. However, the vehicle barriers have never been modified to comply with NUREG 6190 and still cannot perform their credited safety function. This information was reviewed as part of a VSSA, prompting another PISA.

Conduct of Engineering: Performance of VSSAs played a direct or indirect role in the declaration of each PISA discussed above. These assessments appear to be providing an effective mechanism for identifying latent vulnerabilities in credited safety systems caused by outdated, non-compliant safety bases and lack of robust Formality of Operations. VSSAs for most safety-class and safety-significant systems in LANL nuclear facilities are scheduled to be completed by the end of FY09.

Safety Basis: Once an applicable issue is identified, the PISA process provides a formal, systematic, and transparent mechanism to determine appropriate compensatory measures and helps inform NNSA's understanding of risks. In each of the three cases above, once issues were identified through VSSAs or other means, facility management promptly declared PISAs. This type of timely and conservative utilization of the PISA process is an important tool for effectively managing emergent issues and vulnerabilities as they are identified through efforts to reach 'core' compliance with Formality of Operations and to implement modern, compliant DSAs once they are approved.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 26, 2008

MEMORANDUM FOR: Timothy Dwyer, Technical Director
FROM: Brett Broderick/Todd Davis, LANL Site Representative
SUBJECT: Activity Report for Week Ending September 26, 2008

The site representatives were at DNFSB-headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 3, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 3, 2008

Contaminated Puncture Wound: This week, the LANL accident investigation team issued their final report on the recent Plutonium Facility contaminated puncture wound. The team concluded that an undetected metal spur left on a part during a machining operation penetrated the worker's personal protective equipment and punctured the worker's hand. The following three judgments of need (JONs) were identified: LANL should require specific procedures for machining and cutting hard metals (e.g., stainless steel) that identify appropriate hazards and controls; LANL should require part inspection and mitigation of sharps hazards after each cutting or machining operation; and LANL should develop remote and automatic metal handling, cutting, and machining techniques to reduce worker exposure to potential puncture hazards. A separate team is scheduled to develop a corrective action plan based on these JONs by the end of October (site rep weeklies 8/29/08, 8/22/08, 8/15/08).

Site-Wide Fire Protection: This week, after years of negotiation, the National Nuclear Security Administration (NNSA) and Los Alamos County signed a contractual Cooperative Agreement for providing enhanced fire department services to LANL. The new Cooperative Agreement formalizes expectations for minimum overall fire department staffing per shift, minimum shift staffing at key fire stations, response times for nuclear facility emergencies, and compliance with National Fire Protection Association (NFPA) standards. The agreement also establishes a 'major nuclear facilities reserve force' of 7 fire fighters that cannot be deployed to respond to non-LANL events without notifying NNSA. Finally, the Cooperative Agreement creates a requirement for fire department personnel training plans to be jointly reviewed and approved annually by both the county and NNSA.

LANL also recently completed an assessment that verified the site-wide water supply system has adequate tank capacity and appropriate alarm set-points to support the functional requirements of credited fire suppression systems in LANL nuclear facilities. The report did identify several opportunities for improvement including the need to formalize reporting to nuclear facilities when supply system upsets or degradation may impact fire suppression system operability and a need to assess maintenance instructions against the NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*. These improvements are planned for FY09. Because a number of LANL fire suppression systems are credited in nuclear facility DSAs, timely completion of these improvements seems warranted (site rep weeklies 8/1/08, 7/18/08).

Radioactive Liquid Waste Treatment Facility Replacement Project (RLWTF-R): The RLWTF-R project is currently planning to combine Critical Decisions (CD) 2 and 3 and to perform substantive final design activities prior to gaining combined CD 2/3 approval. Because of this deviation from the traditional CD process described in DOE Order 413, the NNSA site office issued a direction letter this week to clarify expectations for what deliverables are required prior to proceeding into final design. NNSA-mandated deliverables included the following: • Safety Design Strategy document, • Rec. 2004-2 confinement ventilation evaluation, • final materials selection recommendations for process tanks and piping, • Preliminary Documented Safety Analysis, • recommendations for hold points during final design to ensure adequate integration of safety and the design, and • identification of adequate influent storage capacity via Waste Management Risk Mitigation tankage or a viable alternative.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 10, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 10, 2008

Transuranic Waste Operations: The RANT shipping facility credits several 1-hour rated fire walls with preventing the propagation of fires that could impact transuranic waste. A sealant material with an unknown fire rating was used to treat two credited fire walls. With this sealant present, the fire rating of the walls is indeterminate and may not provide the required 1-hour rating. Facility management declared a potential inadequacy of the safety analysis (PISA) and suspended operations.

The sealant fire rating issue had been previously identified. The Facility Operations Director (FOD) issued a standing order that established additional combustible loading controls as compensatory measures to disposition the concern. However, this standing order did not adequately address all relevant fire propagation scenarios and had been allowed to expire. In addition to declaring the PISA, facility management also stated that FOD-issued standing orders were no longer considered an appropriate way to disposition issues where a TSR-level design feature cannot perform its credited safety function. Like other recent PISAs at transuranic waste facilities, these deficiencies were identified as a result of a vital safety system assessment (site rep weekly 9/19/08).

Formality of Operations: In August, the NNSA site office directed LANL to provide additional detail and justification for any required elements of Formality of Operations that wouldn't be implemented by the end of FY09. Last week, the site office acted on LANL's response, approving post-FY09 implementation for specific conduct of engineering deliverables at the Plutonium Facility including completion of priority drawings for vital safety systems. The site office disapproved proposed post-FY09 implementation dates for conduct of maintenance and conduct of engineering at the Weapons Engineering Tritium Facility (WETF) and directed LANL to either resubmit acceptable implementation milestones or provide justification for why FY09 implementation is not feasible along with compensatory measures that can be instituted in the interim (site rep weekly 8/22/08).

With the exceptions noted above for the Plutonium Facility and WETF, all approved milestones for Formality of Operations implementation at LANL nuclear facilities are in FY09. The site office has heavily incentivized meeting these aggressive implementation milestones with an award term performance-based incentive (PBI). The award term PBI appears to have helped garner senior management support for adding substantial resources to accelerate implementation efforts.

Chemistry and Metallurgy Research (CMR) Building: LANL is in the process of developing a 10 CFR 830 compliant Documented Safety Analysis (DSA) that supports operation of CMR beyond 2010. As a part of the safety basis development strategy, LANL committed to submitting portions of the analysis to the site office at key points (phase gates). Last week, LANL submitted draft portions of the DSA to the site office for comment including the hazard and accident analysis. Notably, the unmitigated off-site consequences for a seismically induced facility fire scenario were estimated to be approximately 43 rem. Engineered safety controls identified to mitigate or prevent accident scenarios include the fire suppression system, ventilation system and material containerization (floor wells, safes). Administrative controls include facility material inventory (i.e., material-at-risk) and transient combustible controls. Following site office review of the submittal, LANL will schedule a phase gate review session to resolve issues and obtain site office concurrence.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 17, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 17, 2008

Contractor Assurance: Last week, the Institutional Management Review Board approved the laboratory's baseline integrated assessment schedule (IAS) for FY09. The approved IAS shows roughly 350 assessments planned for FY09, down from about 500 in FY08. LANL management noted that the decrease reflects a more mature institutional process for identifying and eliminating duplicative reviews across the lab. The FY09 IAS includes three Director's Institutional Assessments focused on functional areas including subcontractor safety, waste management and the maintenance program. However, the IAS does not include any 'facility-centered' Director's Assessments that would provide independent, broad-based review of compliance with DOE requirements for LANL's nuclear facilities. These types of facility-centered reviews have not been performed at the lab since FY07 (site rep weekly 5/23/08).

Weapons Engineering Tritium Facility (WETF): The TSR-level Pressure Safety Program at WETF requires the maximum allowable working pressure for tritium-bearing systems to be identified and protected. Based on concerns raised by the Board's staff, WETF personnel concluded this week that a portion of the safety-significant Tritium Gas Handling System was not adequately protected from potential overpressurization. This issue led to broader questions about the implementation of Pressure Safety Program requirements across WETF. As a result, facility management declared a TSR violation based on a breakdown of the Pressure Safety Program and suspended operations. LANL management is chartering an independent review of the implementation of all TSR-level controls at WETF to identify any other latent deficiencies that may exist.

Chemistry and Metallurgy Research Building Replacement (CMRR): The CMRR Nuclear Facility will be connected to the Plutonium Facility by an underground tunnel to support safe and secure nuclear material transfers. The original intent was to tap into an existing section of tunnel that currently houses interim radiography operations, based on the assumption that by the time CMRR Nuclear Facility construction began, radiography operations would have moved into a new Long Term Radiography facility. However, Long Term Radiography project activities have been suspended and the existing tunnel will be occupied by interim radiography operations longer than originally assumed. This will likely require the CMRR project to design a new tunnel to connect the two facilities. This could present a number of new design and construction challenges including locating a suitable site to create a large new penetration in the Plutonium Facility structure. The design and equipment sizing for key safety systems including fire suppression and confinement ventilation could also be affected.

Plutonium Facility: In Board correspondence dated May 30, 2008, the staff noted that hazards associated with hydrogen generation for weapons-grade plutonium aqueous processing operations may have been inappropriately screened during development of the new Documented Safety Analysis. The current facility safety analysis also does not identify this potential hazard. In response to this concern, facility personnel recently completed preliminary calculations for hydrogen concentrations in the aqueous process vessels. On Friday, LANL declared a potential inadequacy of the safety analysis based on these calculations. Currently, only one process vessel contains significant plutonium solution. Facility management identified an initial compensatory measure to provide a vacuum purge for this vessel. In addition, plutonium dissolutions are on hold pending resolution of

this issue.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 24, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director

FROM: B. Broderick and R.T. Davis

SUBJECT: Los Alamos Report for Week Ending October 24, 2008

Bamdad and Plaue were onsite this week reviewing Plutonium Facility safety basis and safety system upgrade efforts. Andersen, Hadjian, Kimball, and Rizzo were also onsite reviewing sitewide seismic issues and the structural design of the Chemistry and Metallurgy Research Building Replacement.

Contractor Assurance: The LANL Deputy Director has approved a change to the laboratory's Integrated Assessment Schedule for FY09 to include a 'facility-centered' Director's Assessment of the Chemistry and Metallurgy Research Building and select waste facilities. The resumption of facility-centered Director's Assessments, which haven't been performed since FY07, is positive and should help strengthen the overall effectiveness of LANL's Contractor Assurance (site rep weekly 10/17/08).

Plutonium Facility: The TA-55 Reinvestment Project (TRP) is a 3 phased effort to improve and upgrade safety systems and overall facility infrastructure. Phase 2, which is nearing critical decision-2, includes several important safety improvements (e.g., glovebox stand upgrades, uninterruptible power supply replacement, confinement door replacement and vault water bath storage tank replacement). Completion of these projects, along with implementation of a safety class active confinement ventilation system, is crucial to the overall LANL effort to significantly improve the confinement strategy and overall safety posture of the Plutonium Facility over the next 3 to 5 years. Recently, facility management requested a significant acceleration of Phase 2 of the TRP. This request is based on the high priority nature of the replacement and upgrade projects in Phase 2 and recognition that recent program decisions have reduced the anticipated operational tempo of the facility near-term, opening a window of opportunity to accelerate work on critical infrastructure.

Transuranic Waste Operations: LANL recently exercised the new remote venting capability at Area G to address the last 11 unvented drums associated with the High Activity Drum campaign. Once vented, the flammable gas concentration inside of a drum must fall below a specified limit before it can be handled as a normal vented drum at Area G or be shipped to the WCRR repackaging facility for any additional processing that may be required prior to final disposition. Five of the newly-vented high activity drums retained steady-state hydrogen concentrations above the existing administrative limit of 1%.

This week, LANL requested and received NNSA approval to increase the allowable hydrogen concentration limit to 4%, based on analysis and guidance contained in DOE Standard 5506, *Preparation of Safety Basis Documents for Transuranic Waste Facilities*. In its approval memo, NNSA stipulated that this TSR change is only applicable to the five remaining high activity drums and the limit will revert to 1% after these drums are dispositioned. All remaining drums associated with the High Activity Drum campaign have now been transferred to WCRR for final processing.

Training: Development of compliant and approvable Training Implementation Matrices (TIM) for LANL nuclear facilities has been a persistent challenge. However, LANL recently submitted TIMs for all nuclear facilities. These TIMs describe selection, qualification, certification and training requirements, per DOE orders. This is an important step in the overall implementation of conduct of training, which continues to lag behind other elements of the Formality of Operations initiative.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 31, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 31, 2008

Radioactive Liquid Waste Treatment Facility (RLWTF): On Wednesday, LANL identified an active leak site in a legacy sludge tank (TK-7) associated with liquid transuranic waste processing operations. This tank contains approximately 17 Am-equivalent curies of settled sludge and water. A plastic containment measure, which was recently applied at this location due to visual indications of corrosion, contained the leakage. No external surface or airborne contamination was identified. Initial response actions included providing a more robust plastic containment around the leak site and a larger containment feature beneath the tank to mitigate a more catastrophic failure.

As a part of the restart efforts for transuranic liquid waste operations (Room 60), a newer sludge tank (TK-7A) was installed to replace TK-7. LANL had previously attempted to deinventory TK-7 but failed due to clogging of the transfer piping. Most of the clogged transfer piping was replaced and TK-7 deinventory was planned to be performed as an initial evolution following Room 60 restart. To resolve the TK-7 leak and place the facility in a safe/stable configuration, LANL requested site office approval on Wednesday to perform this deinventory in advance of the contractor readiness assessment (currently scheduled to begin next week) and NNSA authorization to restart Room 60 operations. LANL noted that the necessary procedures and qualified operators were available for this operation. Also, the transfer path (except a small portion associated with TK-7) has been recently tested in anticipation of restart. Following site office approval of LANL's plans for this evolution, facility personnel attempted to deinventory the tank on Friday; however, efforts to transfer sludge from TK-7 to TK-7A were unsuccessful. LANL is currently considering additional options to resolve this issue.

Formality of Operations: Available site resources, in particular facility and system engineering, have constrained LANL's plans and progress on implementing Formality of Operations to increase confidence in facility safety systems and safety programs. Recently, LANL designated approximately \$20 M in FY09 funding to provide additional external resources to augment facility resources for implementation of Formality of Operations. Each of the LANL nuclear facilities has identified their functional area needs (e.g., system engineers, procedure writers, and training instructors) and these are being matched with specific resources available from corporate partners.

Weapons Engineering Tritium Facility (WETF): On October 20th, the circuit that provides power to the WETF ventilation system was de-energized during the latest evolution in support of a vaguely-defined, on-going troubleshoot-and-repair maintenance activity. This secured the dedicated ventilation feature that had been provided to exhaust offgas from tritium-contaminated components that were staged in plastic bags in a WETF room. Without this ventilation, offgassing from the staged components caused the tritium-level in the room to rise, prompting a tritium monitor to alarm when the concentration reached 20 $\mu\text{Ci}/\text{m}^3$. While this event did not result in appreciable worker uptake or room contamination, it did highlight or reemphasize a number of important opportunities for improvement that facility management now appears to be pursuing. These include: •increased formality in identifying and reviewing changes to previously authorized work scope to ensure new hazards or facility impacts are recognized and appropriately addressed; •more specificity in the scope definition of maintenance activities; •validation of the bases for current alarm set points and moving to a more robustly proceduralized alarm response protocol that is less reliant on expert judgment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 7, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director

FROM: B. Broderick and R.T. Davis

SUBJECT: Los Alamos Report for Week Ending November 7, 2008

This week, Board members Bader, Brown and Mansfield were onsite to conduct facility walkdowns and discuss topics including the Radioactive Liquid Waste Treatment Facility Replacement and Formality of Operations. Staff members Eyler, Kasdorf, Pasko, Plaue and Sautman were also onsite.

Radioactive Liquid Waste Treatment Facility (RLWTF): On Monday, facility personnel successfully transferred sufficient material from TK-7 such that the tank level is below the active leak site that had been identified. Additional actions, which have yet to be developed, will be required to remove the remaining residual sludge from this degraded tank; however, these actions will not be performed prior to formal restart of transuranic liquid waste operations (site rep weekly 10/31/08).

This week, LANL began their Readiness Assessment (RA) for the restart of transuranic liquid waste processing at RLWTF after extensive upgrades were completed to restore the capability to process transuranic liquid waste from the Plutonium Facility. This capability has been unavailable since 2006. On Wednesday, the RA team concluded that the facility had not met the approved readiness prerequisites and LANL management agreed to terminate the review. A number of evolutions could not be performed because facility personnel identified errors in the approved procedures at the pre-evolution brief. Reviews of the remaining procedures by the RA team identified several additional errors that point to inadequate procedure verification and validation. LANL is developing a path forward to resolve these issues and restart this readiness activity. Similar issues with regards to procedure adequacy were identified during other recent readiness assessments related to interim radiography and remote drum venting (site rep weeklies 8/8/08, 6/6/08).

Plutonium Facility: Last week, LANL formally submitted a proposed Plutonium Facility documented safety analysis (DSA) to the NNSA site office for review. New features of the proposed DSA include elevating the functional classification of the fire suppression system from safety significant to safety class for non-seismically induced fires and specifying material-at-risk limits for weapons-grade Pu. While the proposed DSA continues to rely on safety class passive confinement, the planned improvements section commits to implementing a safety class active confinement ventilation system and other important upgrades to improve the Plutonium Facility's safety posture over the next three to five years. If approved, the proposed DSA would replace the existing 1996 Final Safety Analysis Report and a compilation of several dozen other documents that currently constitute the Plutonium Facility safety basis. The scope of the NNSA site office review is limited to ensuring comments from previous review cycles have been adequately resolved. NNSA intends to complete its review and formally act on the proposed DSA by the end of the calendar year.

Formality of Operations: The NNSA site office has reviewed about three-quarters of FY08 Conduct of Engineering deliverables (e.g. Vital Safety System Assessments, System Health Reports, Operability Determinations and System Design Descriptions) and estimates that greater than one-third have quality or consistency issues. The site office plans to provide feedback to LANL on the issues identified during these reviews. Timely communication of NNSA issues and observations appears warranted to ensure that new deliverables, which continue to be produced at an aggressive pace, do not continue to suffer from known process deficiencies.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 14, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 14, 2008

Transuranic Waste Operations: This week, LANL completed shipment of the last of the approximately 235 drums identified in the initial high-activity drum campaign, completing an important step in reducing hazards at Area G (Board letter 1/18/07). Approximately 90 additional above-ground high-activity drums remain in Area G that either exceed the WCRR repackaging facility material-at-risk limit or are cemented sludge drums that require an appropriate method of sampling prior to shipment. LANL plans to perform facility upgrades at WCRR in 2009, in particular, installation of fire suppression in the waste processing glovebox, and associated safety basis upgrades to support processing the waste drums that contain higher material-at-risk. In addition, LANL is working to develop a sampling plan and technique for the cemented drums.

Plutonium Facility: This week, a criticality safety infraction was declared when an item containing roughly 2900g of material was discovered in a vault location with a criticality safety limit of 2500g. This item was shelved in January 2007 and the direct cause of the infraction could not be determined. However, this event did highlight an opportunity to improve the robustness of vault operating procedures. Currently, an operator is required to perform a hand calculation to ensure that an item will comply with the criticality safety limits of its intended vault location prior to shelving. To reduce the probability of human error causing criticality safety infractions, the relevant vault procedure will be revised to require independent verification of the calculation and criticality safety limit compliance.

Next week, the Plutonium Facility will begin a nominal outage period that will continue through December. Unlike last year's outage, on-going programmatic work in the Plutonium Facility will not be suspended. Although the demand to perform programmatic operations during the outage period is expected to be low, a full stand-down was deemed not to be required based on the assertion that concurrent programmatic work would not impact the ability to accomplish outage objectives. These objectives include: • implementing upgrades to the facility control system, • replacing credited HEPA filters, • labeling equipment associated with the ventilation and instrument air systems, • performing system walkdowns to support technical baseline reconstitution, and • establishing a warehouse in the basement for controlled staging of safety class and safety significant equipment and components.

A key lesson learned from last year's facility outage was to complete detailed planning, scheduling and resource-loading well in advance of the outage itself. While high-level outage objectives have been defined, detailed planning and scheduling is still under development with the outage set to begin next Monday. In an effort to ensure timely and effective outage preparation in the future, the Facility Operations Director intends to create a permanent position for a dedicated outage manager.

Chemistry and Metallurgy Research Building Replacement (CMRR): Two recent events at the CMRR Radiological Laboratory, Utility, and Office Building (RLUOB) construction site have prompted LANL management to pause RLUOB construction. One event involved the tipping of a manned boom lift and the other involved a collision between heavy equipment and a forklift. In response, the CMRR project is pairing LANL supervisors with subcontractor supervisors in the field to improve oversight. Management also intends to communicate these lessons learned across the lab.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 21, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 21, 2008

Anderson, Pasko and Plaue were onsite this week to review the Transuranic Waste Facility Project.

Weapons Engineering Tritium Facility (WETF): A number of 1980s-vintage tritium-bearing components are stored for surveillance at WETF in credited containment vessels known as Standard Tubs. As a credited containment vessel, the maximum allowable working pressure (MAWP) of Standard Tubs is required to be defined and protected. This summer, WETF personnel rediscovered a previously-identified discrepancy between the actual bolts installed on the Standard Tubs and those assumed in MAWP derivations. Given this discrepancy, calculations indicated that under worst-case conditions, failure and venting of the legacy components could exceed the MAWP of some tubs.

In July, based on these discoveries, facility management concluded that the situation did not constitute a PISA and could instead be handled through the non-conformance reporting (NCR) process. While LANL's approved PISA process currently provides wide latitude to use NCRs rather than declaring PISAs, there is an expectation to perform an unreviewed safety question determination (USQD) if conformance cannot be restored within hours. The Standard Tub NCR remained open for roughly four months and no USQD was performed. The final NCR closure package determined that the actual MAWP of the Standard Tubs would not be challenged by failure of the legacy components. However, WETF management decided to declare a TSR violation based on the length of time the operability of the credited Standard Tubs was indeterminate and the failure to perform a timely USQD, as required.

Transuranic Waste Facility Project: Solid transuranic waste operations are currently conducted in the 'limited-life' WCRR repackaging and RANT shipping facilities, and at Area G which is required to close by 2015 under a March 2005 Consent Order with the State of New Mexico. The Transuranic Waste Facility Project is intended to design and construct a facility that can provide all necessary solid transuranic waste handling capabilities (i.e. staging, characterization, repackaging, size reduction, and shipping) required to support LANL's future programmatic missions. This week, the Critical Decision-1 (CD-1), *Approve Alternative Selection and Cost Range*, package including the conceptual design report, project execution plan and preliminary hazard analysis report was completed and endorsed by the site office. A decision on CD-1 approval is expected in mid-December. However, if CD-1 is approved, LANL plans to conduct a series of value engineering studies to evaluate, among other things, the feasibility of extending the life of existing facilities (e.g. WCRR and RANT) in order to decrease the scope and cost of this project. If these studies result in significant changes to the project's scope, design, and/or safety strategy following CD-1 approval, then commensurate independent evaluation of the adequacy of these changes appears warranted.

Confinement Vessel Disposition: The Bolas Grande project is currently scoped to remediate 14 six-foot diameter legacy confinement vessels in Wing 9 of CMR. This scope does not include remediating four additional six-foot vessels containing transuranic waste that are staged at Area G and have no defined disposition path. An additional 23 three-foot diameter legacy confinement vessels are also staged at Area G with no defined disposition path. Some of the options that are currently under consideration for dispositioning the three-foot vessels would involve new or prolonged use of the Chemistry and Metallurgy Research Building.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 28, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 28, 2008

Transuranic Waste Operations: Last Sunday, a deflagration occurred during remote drum venting operations at Area G. The affected drum contained roughly two Pu-239-equivalent curies of material that was cemented into 35 one gallon containers and packed in a 55 gallon drum in the 1980's. The deflagration did not cause energetic ejection of drum contents and the venting enclosure was not breached so all resultant contamination was contained in the enclosure. Five operators involved in the evolution were taken to the hospital after reporting respiratory distress thought to be caused by chemical vapors emanating from the newly vented drum or combustion products from the deflagration. All operators have reported back to work, although one remains on medical restriction.

The cause of the deflagration remains unclear and investigation continues. Eight operators were maintaining the TSR-controlled 90 foot separation distance from the HEPA-filtered enclosure when the event occurred. Personnel reported hearing an abnormally loud noise when the spark-resistant venting tool punctured the 55 gallon drum and almost immediately thereafter smelled an unusual sulfurous odor. Three operators outfitted in personnel protective equipment and respirators (the balance of operators were in street clothes) made a re-entry into the enclosure, observed evidence of a deflagration, and exited the area. Soon after, the five operators developed respiratory symptoms.

The LANL Emergency Management and Emergency Response groups and the Los Alamos Fire Department were notified and responded to the event. Laboratory HAZMAT personnel characterized the drum using thermography to detect any residual combustion. When none was observed, they re-entered the enclosure and plugged vent holes with sample ports, thereby resealing the 55 gallon drum. While the Fire Department did transport the five affected operators to the hospital, they never entered Area G to survey the scene of the deflagration. The affected drum has since been decontaminated, re-secured in a filtered 85 gallon overpack and restored to a segregated and tightly controlled unvented drum storage array pending further investigation and the development of a path forward.

Weapons Engineering Tritium Facility (WETF): Last week WETF management declared a TSR violation related to credited containment vessels known as Standard Tubs. The maximum allowable working pressure (MAWP) of Standard Tubs is required to be identified and protected. Some tubs contain legacy tritium-bearing components that are known to be over-pressurized, and the TSR violation was based on a long period of indeterminacy as to whether a worst case failure of the legacy components would exceed the MAWP of the tubs. Despite the TSR violation, the ultimate conclusion was that the MAWP of the Standard Tubs would not be exceeded under worst case conditions.

This week, new information surfaced that a critical parameter used in calculating worst-case pressures inside the tubs was in error. Recalculated maximum internal pressures show that the MAWP for two tubs is approached, but not exceeded under normal ambient temperature (i.e. 20°C); but is exceeded under credited fire conditions (i.e. 120°C). In response, WETF management has declared a potential inadequacy of the safety analysis. The two affected tubs are stored in an access-restricted room with stringent combustible loading limits. An initial justification for continued operations (JCO) is being prepared for interim storage and a follow-on JCO is planned to remove the legacy components from tubs and reclaim their tritium to eliminate the pressure hazard (site rep weekly 11/21/08).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 5, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 5, 2008

Davis was offsite this week.

Plutonium Facility: A corrective action plan has been issued to address judgments of need developed during the LANL accident investigation of the August 2008 contaminated puncture wound. The puncture wound was sustained by a Plutonium Facility operator who was using a mechanical cutting device called a nibbler to prepare a stainless steel sample. In addition to the judgments of need, development of the six individual 'Action Plans' also considered information resulting from on-going efforts to analyze all unplanned glove openings at the Plutonium Facility.

The approved Action Plans involve: • revising the Plutonium Facility Design Change Package process to require more participation from glovebox workers in equipment planning and design, and requiring consideration of remote and automated approaches, • piloting and evaluating use-every-time procedures that incorporate Human Performance Improvement principles for a process that involves latent sharps hazards, • restructuring the Plutonium Facility Glovebox Glove Integrity Program to effectively monitor and analyze glove opening data to define better controls and glove properties, • review existing procedures for working with hard materials to ensure adequate controls are provided, • revising Plutonium Facility procedure writing guidance to reflect inspection and latent sharp mitigation expectations for operations involving hard materials, and • reviewing these Action Plans for applicability at the WCCR repackaging facility which was asserted to be the only other LANL facility faced with similar hazards (site rep weeklies 10/3/08, 8/29/08, 8/15/08).

Conduct of Engineering: The pace of progress for a number of important elements of Conduct of Engineering and the broader Formality of Operations initiative has been limited by the availability of cognizant system engineers (CSE). This week, LANL management announced a significant incentive program designed to attract qualified engineers to voluntarily become CSEs. The incentive program seeks to quickly fill the current nuclear facility staffing shortfall of approximately 20 CSEs. The program involves a bonus for becoming a CSE, a bonus for timely completion of CSE qualifications, and a large bonus for remaining a qualified CSE for three years. To help reduce attrition, the large retention bonus will also be available for some existing CSEs.

Chemistry and Metallurgy Research Building (CMR): Wing 9 hot cell work in support of the Advanced Nuclear Fuel Cycle Initiative (AFCI) is not currently reflected in the programmatic baseline for post-2010 operations at CMR. The Department of Energy's Office of Nuclear Energy (NE-51) recently sent a letter to the NNSA site office attesting that CMR was uniquely suited for performing mission-critical AFCI work related to fuel research, development, and qualification. In response, the site office has proposed a path forward in which the AFCI program will fund the development of an addendum to the CMR Documented Safety Analysis being prepared for post-2010 operations. This addendum is intended to allow decision-makers to clearly understand the scope and material-at-risk associated with proposed AFCI activities and the incremental hazards and risk posed to workers and the public should the AFCI scope be incorporated into the programmatic baseline (site rep weekly 5/23/08).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 12, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 12, 2008

Pasko was onsite this week to attend the Integrated Nuclear Planning workshop.

Formality of Operations: Recently, the site office met with LANL to provide comments on the Fiscal Year (FY) 2008 Conduct of Engineering products including Vital Safety System Assessments (VSSAs), System Health Reports, Operability Determinations and System Design Descriptions. For the VSSAs, the site office noted that the depth of assessments were inadequate in many cases (inadequate document review, interviews and walkdowns, failure to evaluate surveillance test procedures). In addition, the site office noted that the assessment team members were intimately involved with the system being assessed in many cases (e.g., the system engineer or maintenance manager), which may have adversely impacted the assessment outcome. For example, several assessment issues were identified as 'opportunities for improvement' instead of deficiencies in cases where the issue could impact system operability. This feedback was provided informally to LANL with the expectation of improving the Conduct of Engineering products during FY 2009.

This week, LANL personnel noted that a revised VSSA procedure that addresses these issues is planned in the near future. However, the bulk of the VSSAs and other engineering products completed during the later part of FY 2008 were done on safety class systems at LANL facilities (i.e., the most important safety systems). Because of the issues identified by the site office, LANL may need to revisit the Conduct of Engineering products for these important facility safety systems.

Radioactive Liquid Waste Treatment Facility Replacement Project (RLWTF-R): Last week, LANL submitted the Recommendation 2004-2 confinement ventilation evaluation and the material selection recommendations to the site office. For the confinement ventilation evaluation, LANL concluded that the system classification of "important to safety" (defense in depth) is appropriate based on a conservative analysis of the worst case accident scenario (full facility fire). Dose consequences for this accident scenario are estimated to be 0.76 rem offsite and 45 rem to the collocated worker. LANL evaluation of the confinement ventilation system against the Ventilation System Evaluation Guidance document did not identify any gaps. For the material selection recommendation, LANL concluded that lined stainless steel was appropriate for the majority of the facility safety significant tanks and pumps. Although fiberglass-reinforced plastic was identified as a preferred material because of compatibility with the process streams and cost, use of this material would significantly increase the facility fire loading and was therefore not considered a viable option. The site office is reviewing these products, which represent two of the documents identified by the site office in late-October that are required prior to proceeding into final design (site rep weekly 10/3/08).

Integrated Nuclear Planning: This week, LANL, the NNSA site office and NNSA Headquarters held a workshop to discuss the waste management programs and projects. For the Transuranic Waste Facility Project, NNSA decided to postpone the Energy Systems Acquisition Advisory Board meeting that was scheduled for later this month to support a critical decision-1 (approve alternative selection and cost range) for the project. NNSA and LANL plan to revisit the overall solid transuranic waste program to identify the best option (within current constraints) that supports the enduring waste mission at LANL.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 19, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 19, 2008

Davis was offsite this week. The staff held teleconferences on the Chemistry and Metallurgy Research Building and Radioactive Liquid Waste Treatment Facility Replacement projects.

Weapons Engineering Tritium Facility (WETF): Hot operations in WETF have remained suspended since October when a TSR violation was declared based on a programmatic breakdown of the Pressure Safety Program. In response to these issues, facility management initiated a comprehensive review of the implementation of pressure safety requirements for all pressurized tritium systems credited at WETF (e.g. tritium gas handling system and tritium containment vessels). A separate, but related effort is evaluating the implementation of other important credited safety management programs such as the Containerization Program and the Hazardous Material Protection Program. When these evaluations are complete, WETF management intends to use established criteria to bin resulting issues and non-compliances into those that must be addressed prior to resuming hot operations and those that can be dealt with post-resumption.

Resumption of hot operations is needed to allow the processing of over-pressurized legacy tritium-bearing components that are currently stored in credited containment vessels whose maximum allowable working pressures could be exceeded under worst-case accident conditions. These containers were the subject of a potential inadequacy of the safety analysis that resulted in a positive unreviewed safety question. A justification for continued operations (JCO) was submitted to the NNSA site office on December 2nd to define and authorize the conditions under which the affected containers could continue to be safely stored since their current configuration is outside the approved WETF safety envelope. The site office has yet to act on this JCO. WETF personnel are developing a second JCO intended to scope, analyze, and define controls for ultimate processing of the pressurized legacy components to eliminate the existing hazard (site rep weeklies 11/28/08, 11/21/08, 10/17/08).

Chemistry and Metallurgy Research Building (CMR): Last week, CMR management declared that the facility had achieved 'core' implementation of Conduct of Operations. CMR is the first nuclear facility to declare implementation of Conduct of Operations since LANL established formal criteria defining requirements for 'core' and 'mature' implementation of the conduct of operations, maintenance, engineering and training elements of the Formality of Operations initiative. For the operations element, core implementation requires a facility to achieve compliance with all 18 chapters of the LANL Conduct of Operations manual that is modeled on DOE Order 5480.19, *Conduct of Operations*. The review to independently verify adequate implementation is scheduled for January.

Transuranic Waste Operations: Investigation continues into the November remote drum venting deflagration event at Area G. The investigation team is evaluating a number of potential causes of the event including a hydrogen deflagration (possibly initiated by electrostatic discharge between the venting tool and electrically isolated metallic objects inside the drum) and the in-drum formation of shock sensitive energetic materials that could have been impacted during venting. In an effort to gather additional data to help determine the cause of the event, preparations are being made to analyze combustion residue collected from the scene and to allow the lid of the 55-gallon 'event drum' to be removed to perform visual and forensic examination (site rep weekly 11/28/08).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 26, 2008

MEMORANDUM FOR: T. J. Dwyer, Technical Director

FROM: B. Broderick and R.T. Davis

SUBJECT: Los Alamos Report for Week Ending December 26, 2008

Broderick and Davis were offsite this week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 2, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 2, 2009

Mr. Broderick was offsite this week.

Plutonium Facility: Last week, the site office issued their Safety Evaluation Report (SER) for the Documented Safety Analysis (DSA) and Technical Safety Requirements. Implementation of these documents includes upgrading the classification of the fire suppression system for non-seismically induced fires and identification of material-at-risk (MAR) limits for weapons-grade plutonium. The SER identified 13 Conditions of Approval (COAs) including the following:

- submittal of an integrated project management plan in March 2009 for the upgrades proposed in the DSA that provide a safety class active confinement ventilation system within the next 3 to 5 years;
- for the facility fire suppression system, completion of a gap analysis against NFPA 13 and 25, system adequacy analysis and TSR operability requirements – these actions are due in March 2009 with a subsequent projectized plan to address the results in May 2009;
- completion of a comprehensive Fire Hazards Analysis (FHA) that is integrated with the DSA and the identification of effective combustible loading control procedures that eliminate the possibility of a floor-wide fire – the FHA is due in June 2009 with procedures and DSA integration during the next annual update (December 2009);
- LANL shall accelerate the schedule for seismically upgrading gloveboxes – completion by the end of Fiscal Year 2011.

All of the COAs are required to be included in the site issues management tracking system. LANL is also required to submit a resource-loaded implementation schedule with a completion date of no later than the end of calendar year 2009.

Chemistry and Metallurgy Research Building (CMR): Recently, LANL submitted their evaluation of an exit strategy for the CMR Building that does not include use of the CMR Replacement Nuclear Facility (CMRR NF). The report asserts that all options evaluated given this constraint substantially increase the safety, security and programmatic risks at LANL versus the current approved baseline. Alternatives for analytical chemistry/material characterization were identified as having the largest scope, schedule and budget implications. LANL recommends additional evaluation of elevating the Radiological Laboratory, Utility, and Office Building to a category 2 nuclear facility if the CMRR NF is significantly delayed. LANL also recommends pursuing additional actions to improve the Plutonium Facility vault utilization.

To support operations at CMR beyond 2010, LANL is in the process of developing a 10 CFR 830 compliant DSA. During development of the safety basis, LANL committed to providing portions of the analysis in 3 phases. In early October, LANL submitted the second phase of the analysis. This week, the site office provided comments to LANL including better identification of MAR for accident scenarios and identification of safety class controls for assumptions that are identified during scenario development for design basis accidents.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 9, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 9, 2009

Plutonium Facility: This week, a glovebox glove breach occurred while an operator was performing housekeeping activities in a heat source plutonium (i.e. Pu-238) glovebox. To prepare a glass condenser tube to be removed as waste, an operator applied tape to the outside of the tube, broke the glass with a blunt tool, then folded the broken tube over to reduce its size. Post-evolution monitoring found contamination in excess of two million disintegrations per minute on the palm of the operator's inner glove. The inner glove was intact and nasal smears showed no indication of an uptake.

An integrated work document (IWD) provided activity-level work control for the glass breaking and handling portion of this operation. Although one section of the IWD calls for protective leather or Kevlar gloves to be used over the glovebox gloves 'as necessary,' the section identifying required personnel protective equipment (PPE) and the IWD's procedural steps clearly require the use of protective over-gloves and puncture resistant inner gloves. The operator was not wearing either of these two required pieces of PPE during the glass breaking and handling operation, nor was the evolution performed in accordance with the procedural steps in the IWD.

The breached glovebox glove is being removed for examination in an attempt to determine the direct cause of the event. Even if the broken glass is determined not to have breached the glovebox glove, this event still highlights a case where an operation involving latent sharps in a high hazard environment was performed without appropriate controls in spite of the significant attention that has been focused recently on safe handling of sharps inside gloveboxes. In response, facility management has suspended all glass breaking and handling operations by the affected group and has committed to developing a single procedure for use in all glass breaking and handling operations in the facility. This new procedure will be incorporated into the glovebox worker training process.

Transuranic Waste Operations: Area G is operating under a justification for continued operations (JCO) that addresses positive unreviewed safety questions related to deficiencies found in the credited vehicle barriers and dome door restraints. The JCO includes several commitments to improve analyses and implement improvements to the vehicle barriers and dome door restraints by December 31, 2008. When this date passed without all commitments being satisfied and without formal relief from the NNSA site office on the deliverable dates, there was significant confusion as to whether the safety basis had been violated and whether Area G operations continued to be authorized. On Thursday, the site office issued a letter granting relief on the original deliverable dates. This experience has prompted LANL to begin screening all other existing JCOs, to identify other instances where there may be ambiguity in whether a commitment constitutes a formal control or requirement.

Site-Wide Seismic Hazards: Recently, LANL provided the site office with an update on the plans to re-evaluate the Updated Probabilistic Seismic Hazard Analysis (UPSHA). The approach includes near-term actions to complete recommendations in the UPSHA (e.g., use of next generation attenuation ground motion relationships and trenching studies) and a series of longer-term actions. The near-term actions and analyses are expected to result in a 9 to 12 month delay in facility-specific evaluations (i.e., the SAFER project). LANL plans to submit a revised JCO to accommodate this delay. The existing JCO expires in June 2009 (site rep weeklies 9/12/08, 6/27/08).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 16, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 16, 2009

This week, Board members Bader, Brown and Winokur were onsite to conduct facility walkdowns and discuss topics including Formality of Operations, the Chemistry and Metallurgy Research Building exit plan and transuranic waste activities. Staff members Moury and Plaué were also onsite.

Transuranic Waste Operations: In September 2008, LANL submitted and the site office approved a formal recovery plan to address a Technical Safety Requirement (TSR) violation associated with the Area G lightning protection system. The site office approval letter included a condition of approval (COA) that required specific actions to be performed prior to December 1, 2008. The letter also noted that the approval expires on December 31, 2008. One of the actions required ground resistance measurements on all transuranic waste storage areas and has yet to be completed. LANL submitted a written request for relief from this requirement in early-December; however, the site office did not respond to this request. On Tuesday, the Facility Operations Director was notified of this issue and directed a suspension of transuranic waste operations. On Thursday, the site office approved an extension of the recovery plan and operations were allowed to be resumed. Although Area G did not comply with a COA and approval of the recovery plan had expired, the LASO letter on Thursday concluded that the facility was not in violation of its TSRs. Instead, LASO concluded that Area G was not in compliance with the hazard controls specified in a recovery plan. The site office also requested that LANL improve its performance in tracking and completing COAs in a timely manner.

Chemistry and Metallurgy Research Building Replacement (CMRR): The site office recently requested that the CMRR project team charter an independent review using corporate reachback to determine if the technical requirements in the Preliminary Documented Safety Analysis (PDSA) have been adequately captured in the interim design and to evaluate key project procedures that will be utilized during detailed design. This week, the team completed their review and provided feedback to NNSA Headquarters and the site office. The team identified a number of positives and the following four issues: specific design criteria for safety class fire suppression systems have not been established by DOE; most design documents have not been revised for consistency with the most recent PDSA (although redline documents reviewed by the team for most safety systems did appear consistent); several codes and standards identified in the PDSA and system design descriptions need to be revised; and project specific procedures need to be developed or revised in some cases. Overall, the team concluded that the design for key safety structures, systems and components is well developed and meets the requirements identified in the PDSA. This team will provide their final report as input to the Technical Independent Project Review that is scheduled to start the last week in January.

Weapons Engineering Tritium Facility (WETF): Currently, activities at WETF include gas transfer system research, development, and design authority functions. NNSA Headquarters (NA-10) has announced a decision to consolidate these types of gas transfer system activities at Sandia National Laboratories and has tasked Sandia to develop a transition plan detailing how this consolidation will be effected. The ramifications of this decision on the near and long term future of WETF are not yet clear. However, this new direction may shift focus at WETF to rapidly de-inventorying the roughly 330 grams of tritium remaining in the facility and affect the strategy, priority and schedule for improving the facility's safety basis and implementing Formality of Operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 23, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 23, 2009

Weapons Engineering Tritium Facility (WETF): Tritium stored outside of process equipment or gloveboxes is required to be contained within credited vessels whose maximum allowable working pressure (MAWP) is identified and protected. LANL has submitted and the NNSA site office is reviewing a justification for continued operations (JCO) to store, handle and ultimately process a population of primary containment vessels (PCV) that are known, or have the potential, to have internal pressures exceeding their MAWP. This population of PCVs was identified in the aftermath of a related potential inadequacy of the safety analysis and issues associated with the implementation of WETF's credited Pressure Safety Program. Processing these PCVs is required to eliminate the hazard they currently present. The JCO and its supporting hazard analysis rely primarily on existing controls to perform these processing activities (site rep weeklies 12/19/08, 11/28/08, 10/17/08).

The JCO covers continued storage and processing of 217 PCVs (32% of the total number stored at WETF). Of these, 146 PCVs are currently stored inside some other credited feature (e.g. a glovebox or secondary vessel) that would contain the released tritium should the PCV fail. The remaining 71 PCVs that contain roughly 9 grams of tritium are currently stored in open drums. Since these 71 PCVs exceed (or potentially exceed) their MAWP, the PCVs themselves cannot be relied upon to provide credited containment. Therefore, although the room housing these items is not routinely occupied and is equipped with tritium monitors, the 9 grams of tritium in these 71 PCVs is not protected by a credited containment barrier. Access to the room where these 71 PCVs are stored is not currently restricted and the primary control to ensure worker protection during continued storage of these items appears to be the tritium monitors that would detect, but not prevent a release.

Transuranic Waste Operations: This week, LANL environmental programs management met with the NNSA site office to discuss preliminary plans to augment Area G capabilities in order to substantially increase transuranic waste shipments beginning this fiscal year. LANL continues to be challenged to complete closure of Area G by 2015. To achieve a planned 114 shipments to WIPP this fiscal year (versus roughly 75 shipments last year), LANL plans to add a second shift at the WCRR repackaging facility and the Dome 231 Permacon, startup a debris waste processing line inside the Decontamination and Volume Reduction System facility and other near-term capability and process improvements. To support these activities and to allow additional repackaging activities to occur in Area G, LANL is considering a series of changes to the existing safety basis in parallel with the planned submittal of a new safety basis document. Longer-term plans include a standard waste box characterization line, size reduction capability and preparations for below ground waste retrieval.

Chemistry and Metallurgy Research Replacement (CMRR) Project: The current design response spectra contained in the LANL Engineering Standards Manual (ESM) is based on the May 2007 Updated Probabilistic Seismic Hazard Analysis (UPSHA) and provides bounding spectra applicable anywhere onsite at LANL. In December, LANL committed to updating the ESM to provide site-specific spectra for TA-55/CMRR that reduces some of the conservatism in the bounding site-wide spectra. At the request of the CMRR Project, LANL recently provided site-specific spectra for use during design in advance of the ESM update. Additional LANL activities to refine the UPSHA are on-going and will be reflected in the CMRR spectra when appropriate (site rep weekly 1/9/09).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 30, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 30, 2009

Management: This week, LANL management announced an impending organizational change affecting the Radioactive Liquid Waste Treatment Facility (RLWTF). Programmatic ownership of RLWTF will transfer from the Associate Director (AD) for Environmental Programs to the AD for Stockpile Manufacturing and Support. Responsibility for maintaining and protecting the RLWTF safety basis will also transfer from the Facility Operations Director (FOD) for Environmental and Waste Management Operations (who also oversees solid transuranic waste facilities such as Area G, the WCRR repackaging facility, and the RANT shipping facility) to the Plutonium Facility FOD. Formal transfer of responsibility for RLWTF is expected to occur as early as next week.

Weapons Engineering Tritium Facility (WETF): On Thursday, approximately 100 gallons of water was inadvertently released from a pressurized safety significant fire suppression system during a corrective maintenance activity. The work package for this activity incorrectly identified lock-out/tag-out for an isolation valve associated with a different wet pipe fire suppression system. Once maintenance personnel recognized the system was pressurized, the correct isolation valve was closed, which stopped the release of water. WETF personnel then entered the Limiting Condition for Operation (LCO) for the second fire suppression system (that was now isolated) and access to the WETF complex was controlled due to the potential for contamination. Subsequent samples concluded that the water was not contaminated and clean-up efforts were conducted. Actions were taken Thursday afternoon to return both of the fire suppression systems to service and exit the LCOs. On Friday, WETF management declared a stand-down of all maintenance activities to evaluate and address the potential for similar issues. Criteria for release of these packages are being developed and will be applied based on work priority and risk. LANL investigation of the event is on-going.

Transuranic Waste Operations: NNSA site office personnel recently performed a safety system oversight assessment on waste drums that are credited in the safety bases for Area G, RANT, and WCRR. These drums serve as a key engineered barrier for preventing release of material at risk at LANL's solid transuranic waste facilities, especially at Area G where these drums are typically the only form of robust safety class containment. Preliminary findings presented at an assessment outbrief this week identified a number of issues that the site office asserts could challenge the ability of the waste drums to perform their credited safety functions. One such finding concludes that LANL drum closure procedures do not conform to the drum manufacturer's closure instructions, thus invalidating the required DOT Type A certification of the drum. LANL personnel are reviewing the preliminary report for factual accuracy and to determine appropriate responses to identified issues.

Federal Oversight: Assessments performed by site office safety system oversight (SSO) engineers, like the one described above, have been effective in identifying issues and latent deficiencies in credited safety systems at LANL. SSO engineers are also performing valuable reviews and providing useful feedback on important deliverables (e.g. Vital Safety System Assessments and System Design Descriptions) produced to support implementation of LANL's Conduct of Engineering program. However, the number of these types of assessments and reviews is limited by SSO resources. The site office is currently staffed with two SSO engineers versus an identified need of 6.5 full time equivalents. The on-going NNSA hiring freeze is impacting the ability to fill these key vacancies.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 5, 2009

MEMORANDUM FOR: Timothy Dwyer, Technical Director
FROM: Brett Broderick/Todd Davis, LANL Site Representative
SUBJECT: Activity Report for Week Ending February 5, 2009

The site representatives were at DNFSB-headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 5, 2009

MEMORANDUM FOR: Timothy Dwyer, Technical Director
FROM: Brett Broderick/Todd Davis, LANL Site Representative
SUBJECT: Activity Report for Week Ending February 5, 2009

The site representatives were at DNFSB-headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 13, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 13, 2009

Board member Bader and staff member Pasko were onsite this week to observe an Integrated Nuclear Planning workshop. Pasko also discussed Board Rec. 2004-2 with LANL and NNSA personnel.

Chemistry and Metallurgy Research (CMR) Building: LANL recently submitted the Documented Safety Analysis (DSA) and associated Technical Safety Requirements (TSR) for post-2010 operations in the CMR Building. The DSA supports continued analytical chemistry and material characterization activities in Wings 5 and 7, confinement vessel disposition activities in Wing 9 and deactivation activities in the other CMR wings. Wing 9 hot cell work in support of the Advanced Fuel Cycle Initiative is not currently analyzed in the DSA. Off-site consequences for a seismically induced facility fire scenario are estimated to be approximately 36 rem (Wing 9 material-at-risk to support confinement vessel disposition contributes approximately 14 rem to this scenario).

Weapons Engineering Tritium Facility (WETF): Hot operations at WETF have been suspended since October due to systemic pressure safety issues. A comprehensive review of potentially affected safety systems is underway to evaluate the full extent of pressure safety issues at WETF. This ongoing review recently identified a situation where the failure of a compressor servicing a glovebox could release a sufficient volume of gas to over-pressurize and breach the glovebox. No tritium was present in the affected glovebox upon discovery; however, this condition did result in facility management declaring a TSR violation. The compressor is now physically isolated and its failure can no longer challenge glovebox integrity. Although it resulted in a TSR violation, this discovery is positive because the identification and correction of this type of issue was the reason facility management chartered the ongoing safety reviews at WETF (site rep weeklies 12/19/08, 10/17/08).

This week, LANL also resubmitted a DSA and associated TSRs for WETF that were revised to address comments from a previous NNSA review. The priority for review, approval and implementation of the resubmitted WETF safety basis documents is likely to be highly dependent on the outcome of ongoing transition planning to consolidate all gas transfer system research, development and design activities at Sandia National Laboratories (site rep weekly 1/16/09).

Plutonium Facility: LANL management has submitted an implementation plan for the recently approved Plutonium Facility DSA and associated TSRs. Although the site office Safety Evaluation Report requested implementation by the end of calendar year 2009, the resource loaded schedule currently shows implementation completing in March 2010. LANL plans to implement the TSRs in four phases with an Implementation Verification Review after each phase (site rep weekly 1/2/09).

Safety Basis: LANL currently has ten nuclear facilities (or activities) that require DSAs. Three of these facilities have 10 CFR 830-compliant DSAs that are approved and implemented (WCRR repackaging facility, Nuclear Environmental Sites, and Onsite Packaging and Transportation); two facilities have compliant DSAs that are approved but not yet implemented (Plutonium Facility and Material Disposal Area-B); two facilities have submitted nominally compliant DSAs pending NNSA review (CMR and WETF); and three facilities are still developing compliant DSAs (Area G, Radioactive Liquid Waste Treatment Facility and RANT shipping facility).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 20, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 20, 2009

Plaue was onsite this week to discuss the Chemistry and Metallurgy Research Building and the Chemistry and Metallurgy Research Building Replacement Project.

Fire Protection: This week, laboratory management announced an organizational change that would consolidate all personnel with fire protection-related roles and responsibilities into a single division that would report to the Associate Director for Nuclear and High Hazard Operations. The individual who had been serving as LANL's Fire Marshal has been selected to head this new division. The independent Fire Marshall function will be eliminated and the division leader will be responsible for ensuring the robustness and effectiveness of the program and the quality of program-related deliverables. This new approach and management structure for fire protection is consistent with the way other institutional safety management programs (e.g. safety basis) are implemented at LANL.

Also, lab personnel are designing and will soon begin providing training courses to Los Alamos County (LAC) fire fighters on radiological hazards and fire fighting techniques in radiological environments to improve the preparedness of the LAC Fire Department to effectively respond to a fire in a LANL nuclear facility. Eventually, qualification cards for fire fighters will also be developed.

Plutonium Facility: LANL recently completed a backfit analysis on the Plutonium Facility fire suppression system, which was upgraded from safety significant to safety class in the recently approved Documented Safety Analysis. The backfit analysis concluded that the system could meet its safety function for operational fire events (i.e. fires that are not seismically induced) but recommended actions that could significantly improve reliability. The analysis also identified a vulnerability associated with a lack of redundant risers but concluded the system could perform its safety function based on overall system reliability estimates. A project plan to address gaps identified in the backfit analysis and other system evaluations is being developed.

Chemistry and Metallurgy Research Building (CMR): Last week, a contamination event in Wing 3 of CMR resulted in a worker uptake. An operator was moving bags of contaminated equipment that had been removed from a deactivated glovebox. Following a continuous air monitor alarm, radiological control technicians responded and found alpha contamination on the operator's personal protective equipment and personal clothing. Nasal smears were positive, reading approximately 200 dpm per nostril. The affected operator has been put on a bioassay program and is on restricted duty until bioassay results are available. Follow-up actions determined the event was likely caused by the bag of contaminated equipment being dragged across a rough spot on the lab room floor causing abrasions and eventual breaching of the outermost plastic bag used to control contamination.

Transuranic Waste Operations: Prohibited item disposition and repackaging operations are rate limiting steps to prepare transuranic waste to be shipped offsite. To help meet aggressive waste shipment goals for FY09, LANL management has established a second shift for repackaging low-activity (< 0.47 PE-Ci) solidified waste forms in the Dome 231 Permacon and is preparing to begin a second shift for higher-activity operations at the WCRR repackaging facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 27, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 27, 2009

Bamdad, Batherson, Grover, Gwal, Kasdorf, March and Spatz were onsite this week to review the preliminary documented safety analysis and the designs for key safety systems for the Chemistry and Metallurgy Research Building Replacement Project.

Chemistry and Metallurgy Research Building (CMR): Last week, a custodian's personal protective equipment became contaminated while mopping a floor in the basement of Wing 7 of CMR. Follow-up actions identified an area on the floor of the affected basement room with contamination levels greater than one million dpm (removable contamination measured at roughly 150,000 dpm). The source of contamination was traced to a leak in the (uncredited) Industrial Liquid Waste System piping that transfers low-level radioactive liquid waste from CMR laboratory rooms to the collection system that routes it to the Radioactive Liquid Waste Treatment Facility in TA-50. The CMR Industrial Liquid Waste System is known to have significant material condition issues and some effort has been made to wrap and bag pipe flanges to help control leaks. The leak site that caused last week's Wing 7 basement contamination event did not have any form of leak containment.

In response to this event, facility management has directed that all Industrial Liquid Waste System flanges be systematically wrapped and bagged. Management also intends to establish a periodic surveillance of the bagged flanges to identify and respond to active leak sites and areas where containment may have been lost. Although ensuring potential leak sites have catch containment bags is an important compensatory measure for widespread Industrial Liquid Waste System material condition issues, there are currently no funded plans for physical repairs or upgrades for this system. The Industrial Liquid Waste System is required to remain in service to support current and future programmatic analytical chemistry activities in Wings 5 and 7 of CMR. Since radioactive liquid released from the Industrial Liquid Waste System is a routine source of contamination in certain parts of CMR, improvements or upgrades may warrant additional consideration as part of the ongoing campaign to reduce operational risks and extend the service life of CMR.

Plutonium Facility: A criticality safety infraction was declared recently when an overmass condition was discovered in a glovebox. Last week, operators moved a plutonium part from a casting glovebox into a machining glovebox that still contained metal turnings from a previous operation. The machining glovebox had separate criticality safety limits for approved metal shapes and plutonium metal. The casting operators mistakenly believed that the higher mass limit for approved metal shapes applied to this material move; however, since the machining glovebox already contained metal turnings from a different part, the plutonium metal limit should have been applied. Once the part was moved, the aggregate mass of plutonium in the glovebox was roughly 110% of the posted limit for plutonium metal. Machining operators recognized the overmass condition the next day and responded appropriately. Upon consultation with the Nuclear Criticality Safety Group, facility personnel corrected the overmass condition. This infraction was binned in the lowest significance category.

This event appears to highlight opportunities to improve the clarity and operator understanding of which posted limit (if multiple limits exist) is in force for a given material move, and to strengthen communications between operators on the transferring and receiving ends of material moves.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 6, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 6, 2009

Plutonium Facility: This week, LANL declared a potential inadequacy of the safety analysis (PISA) based on the presence of an unvented transuranic waste container in the facility that may pose hazards that are not analyzed in the safety basis. In late 2007, this roughly 2' x 2' x 4' metal waste container, which was long thought empty, was assayed and found to be holding contents that included gram quantities of plutonium. Upon discovery, the container was entered into the facility waste item database and operators partially removed the container lid under a radiological work permit in an attempt to characterize the unknown contents. A bagged metal cylinder was observed and when contamination was detected on the outside of the bag, the container lid was restored. The container remained in this state until an NNSA facility representative noticed the container was not vented and notified facility management of a potential safety basis concern.

The container vintage and its briefly observed contents suggest that the items inside may have come from a legacy glovebox line that handled tritium and was decommissioned in the early 1990's. If the metal cylinder seen inside the container does hold tritium, helium in-growth from over one half-life of tritium decay could pose a pressurization hazard. Additionally, the known plutonium inventory makes the unvented metal container transuranic waste. The current facility safety basis requires transuranic waste to be packaged in containers with filtered vents and does not analyze hazards that could be presented by unvented transuranic waste containers. The container has been posted and cordoned off while additional information is gathered to support safe handling and ultimate disposition.

Plutonium Facility Safety Basis: The site office safety evaluation report for the plutonium facility included a condition of approval (COA) for the storage of heat source plutonium (HS-Pu) in the safety class vault water bath (VWB). This COA required LANL to 1) modify the VWB limiting condition for operation (LCO) to address conditions of uncovered non-safety class (non-SC) containers, 2) provide a basis for how long non-SC containers would survive uncovered, and 3) provide a schedule for repackaging these containers. These activities were required to be complete by the end of March 2009. This week, LANL requested relief from the second part of this COA noting that additional time is required to provide a basis for how long non-SC containers would survive uncovered.

There are approximately 210 non-SC HS-Pu containers stored in the VWB of which 50 are of various types. In order to perform pressure calculations to address the COA or to support a disposition path for these containers, LANL plans to begin radiography in April. The radiography and associated calculations are scheduled to be complete by December 2009 and March 2010, respectively. A calculation for the other approximately 160 containers stored in the VWB is being updated and will be reflected in the revised LCO. LANL has dispositioned (e.g., processed) 7 of these containers since October 2008 and plans to ramp up to one container per week. In parallel, LANL is pursuing qualification of Fuel Storage Outer containers (both existing and new generation) per the Nuclear Material Packaging Manual to allow over-packing of existing non-SC containers.

Chemistry and Metallurgy Building (CMR): Based on the recent completion of an effectiveness assessment for implementation of Conduct of Operations (10 findings identified), LANL has declared conduct of operations implemented at CMR and submitted this information to the site office.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 13, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 13, 2009

Elliott and Pasko were onsite this week to review criticality safety.

Transuranic Waste Operations: In late February, LANL submitted a proposed waste disposition project strategy for Technical Safety Requirement (TSR) page changes and specific TSR changes to support clarification of safety basis requirements and to improve the efficiency of transuranic waste operations. The submittal of the Area G documented safety analysis, previously scheduled to occur in February, has been delayed to support these and other proposed TSR changes. Last week, the site office approved the following Area G TSR changes: 1) removal of the restriction to only open one transuranic waste container inside the Area G Dome 231 permacon 2) identification of a specific administrative control for arc flash standoff distance between unbonded metal items and the lightning protection down conductors and 3) a revision to the lightning protection system inspection criteria to provide specific requirements and remove broad reference to NFPA 780. The site office also noted that the LANL proposal to change the WCRR repackaging facility allowable headspace gas concentration limit from less than 25% lower flammability limit (LFL) to less than 100% LFL for hydrogen will be evaluated as part of the WCRR annual safety basis update.

Per direction from the NNSA site office, LANL has also submitted a final report on the November 2008 drum deflagration event that occurred during remote drum venting operations at Area G and a proposed path forward for addressing the remaining population of unvented drums. The report postulates that the most credible cause of the event was an electrostatic discharge igniting a flammable mixture of hydrogen and air that had been trapped inside the drum. The electrostatic discharge was thought to be created when the grounded, conductive venting tool punctured the 55-gallon drum lid and a thin layer of lead shielding and came into contact (or near contact) with the charged surface of an insulative plastic containment bag or the charged conductive surface of one of the one-gallon tin cans that were electrically isolated from the larger drum by the bag. This type of electrostatic discharge would be sufficiently energetic to ignite flammable gas concentrations trapped inside the plastic bag since hydrogen-air mixtures have very low ignition energies. Based on analysis of the structural deformation of the affected drum, the report estimates that an 11-12% hydrogen concentration deflagrated during the event. The 'sulfur smell' reported by operators who experienced respiratory distress after the event is thought to be the result of nitrogen oxides created by a chemical reaction initiated by the high temperatures of the deflagration.

Remote drum venting operations have been suspended since November 2008 when the deflagration event occurred. Thousands of additional drums will require venting prior to ultimate disposition, including the 21 remaining above ground unvented drums that are currently in a controlled and segregated storage array. LANL has recommended continued suspension of remote drum venting operations until the existing venting apparatus can be replaced with a more robust engineered system that includes a blast chamber, blast shields, a glovebox, and a HEPA filter train. Until this robust venting system can be procured and fielded (with a target to be operational in 3QFY10), LANL has proposed affixing drum lid restraints and then overpacking the 21 above ground unvented drums to improve the safety of interim storage (site rep weeklies 12/19/08, 11/28/08).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 20, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 20, 2009

The staff held a video teleconference with LANL and NNSA representatives this week to discuss Area G closure planning and the strategy to safely maintain solid transuranic waste processing capabilities. Kimball was also onsite to discuss re-evaluation efforts for sitewide seismic hazards.

Plutonium Facility: Based on questions from an NNSA site office facility representative concerning a temporary modification, LANL declared a Technical Safety Requirement (TSR) violation this week associated with the lack of an alarming oxygen monitor for a particular glovebox. A Plutonium Facility Specific Administrative Control (SAC) requires use of an oxygen monitor that is calibrated quarterly to ensure local alarm response occurs at less than or equal to 5%. This requirement only applies for “potentially pyrophoric processes (plutonium machining/hydriding)” and is intended to reduce the likelihood of a glovebox fire. For the glovebox in question, an oxygen monitor was installed as a temporary modification (the primary monitor was out of service); however, the temporary unit did not provide the local alarm feature. The temporary modification was evaluated under the Unreviewed Safety Question process but two qualified analysts failed to recognize the potential safety basis impact of this modification. Although specific operations in the glovebox did not involve potentially pyrophoric processes, facility management conservatively declared a TSR violation based on a lack of any controls to prevent such operations from being performed.

Follow-up by facility management also identified issues with implementation of this control for other gloveboxes. Although operational oxygen monitors were available and used primarily for quality assurance purposes, some monitors were not being calibrated quarterly per the SAC. In addition, implementing procedures for processes that create pyrophoric material do not include requirements to verify compliance with the SAC. The implementation validation review that evaluated this control noted that the gloveboxes where this control applied were out of service pending installation of the monitors but did not discuss procedural requirements that implement the control.

Fire Protection: The Cooperative Agreement between NNSA and Los Alamos County mandates that the Fire Department (LAFD) notify the laboratory whenever any LAFD emergency response capability drops below 50% of its normal strength. LANL has established protocols to take this initial notification and alert Facility Operations Directors (FOD) via pager so they can take appropriate action. For example, all FODs have been directed to terminate confined space entries and cease hot work that is not protected by an operable fire suppression system, upon notification. Individual FODs will also take facility or area-specific actions, such as instituting roving watches to monitor operations using high temperature equipment and curtailing firing site operations (site rep weekly 10/3/08).

Criticality Safety: LANL has submitted, for NNSA approval, a significant revision to the Nuclear Criticality Safety Program Improvement Plan (PIP). The revised PIP differentiates unit operations that are subject to process drift that could erode criticality safety margin over time and those operations that are resistant to this type of drift. About 215 drift-prone operations must have a compliant criticality safety evaluation (CSE) by October 2010 or stop work. The roughly 175 remaining drift-resistant operations do not have a deadline for compliant CSE completion and could continue using limits that were validated as part of the Augmented Limit Review in the interim.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 27, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 27, 2009

Davis was offsite this week.

Plutonium Facility: This week, prompted by concerns raised by the staff, Plutonium Facility management declared a potential inadequacy of the safety analysis (PISA) and implemented a series of compensatory measures related to the transportation, storage and protection of non-safety class (non-SC) heat source plutonium (HS-Pu) containers. About 200 non-SC containers holding a significant quantity of HS-Pu are stored in the Plutonium Facility's safety class vault water bath (VWB). The VWB is relied on to prevent overpressurization of non-SC HS-Pu containers by keeping them fully covered with water to remove heat generated by intense radioactive decay. This week, facility personnel discovered that the process, hazards and controls associated with transporting non-SC HS-Pu containers from the VWB to laboratory rooms and staging these containers in rooms on the laboratory floor are not adequately described and evaluated in the DSA. As a result, even though non-SC containers being transported or staged are subject to the same stresses from internal heat generation as the non-SC containers in the VWB, they did not benefit from the protection of a safety class control to prevent overpressurization. These discoveries resulted in the declaration of a PISA.

This week, facility management also recognized weaknesses in the content and frequency of surveillances used to ensure the safety class VWB was performing its safety function. Existing surveillances were performed monthly to confirm the water in the VWB was above a minimum level and to visually confirm that all non-SC HS-Pu containers remained fully covered with water. However, due to the length of certain non-SC containers, the existing minimum water level checked by the surveillance was too low to keep all non-SC containers fully covered, as required. Additionally, although VWB surveillances were only required to be performed monthly, LANL calculations indicated that credible system upsets could cause water in the VWB to boil in as little as 18 hours, using conservative assumptions. The loss of water level due to this boiling would quickly begin to uncover non-SC containers. Since an unacceptable condition could be created in a matter of hours, the monthly surveillance frequency was deemed to be inappropriate.

In response to the PISA and recognized weaknesses in VWB surveillance practices, facility management took the following actions. All non-SC HS-Pu containers, except for two particularly large containers, were returned to the VWB. Formal controls have been established to protect the two large non-SC containers in their current location until a path forward can be developed. All operations involving transportation and staging of non-SC containers outside the VWB have been restricted pending further evaluation. The minimum water level has been increased to a height sufficient to submerge all non-SC containers currently in the VWB and this level will be verified daily. Control of container configurations inside the VWB will also be established to ensure non-SC containers are not stacked in an arrangement that is higher than the new minimum water level.

LANL and NNSA site office personnel have begun discussing strategies to accelerate longer-term efforts to better understand and protect non-SC HS-Pu containers. Sustained management attention and urgency appear warranted to reduce risk by dispositioning unneeded or unsuitable HS-Pu material and expeditiously processing or robustly overpacking usable HS-Pu stored in non-SC containers.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 27, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 27, 2009

Davis was offsite this week.

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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 3, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 3, 2009

Plutonium Facility: The NNSA site office approved a new documented safety analysis (DSA) and technical safety requirements (TSR) document for the Plutonium Facility last December. Upon approval, facility management began using the new DSA as the safety basis of record, superseding the patchwork of several dozen documents that had been serving as the Plutonium Facility safety basis. Although the new DSA represents the most up-to-date and complete description of the NNSA-approved risk envelope for the facility, the TSR controls associated with the new DSA are not scheduled to be fully implemented and verified until the second quarter of FY10. Until the new TSRs are verified to be fully implemented, the facility continues to operate under a set of legacy interim TSRs whose development was, in part, a judgment-based consolidation of available controls versus a control set that cleanly and explicitly derived from the collection of previous safety basis documents.

Once it became the safety basis of record, facility personnel began performing unreviewed safety question (USQ) evaluations (both screens and full determinations) against the new DSA and did not consider the previous set of safety basis documents in these evaluations. This week, the NNSA site office challenged the approach of performing USQ evaluations against only the new DSA, rather than against both the new DSA and the previous set of safety basis documents, since the TSRs associated with the new DSA have not yet been fully implemented.

In response to site office concerns, LANL management placed the facility in stand-by mode until the roughly 125 USQ evaluations that have been performed since January can be re-evaluated against the set of previous safety basis documents. Once this evaluation is complete and operations resume, USQ evaluations will be performed against both the new DSA and the previous set of safety basis documents until the TSRs associated with the new DSA are verified to be fully implemented.

Authorization Basis: This week, LANL submitted for NNSA review and approval a revision to the lab's USQ procedure. This proposed revision addresses situations like the one described above by instructing that, "[t]he USQ process must be performed against the relevant safety basis documents, both the current 'implemented' safety basis, and the newly approved safety basis document as appropriate." The proposed revision also introduces a New Information Process for evaluating whether new information constitutes a potential inadequacy of the safety analysis (PISA).

Material Disposal Area (MDA)-B: The NNSA site office recently approved a LANL request to re-categorize MDA-B from hazard category (HC)-3 to less than HC-3 (i.e. radiological). MDA-B is a six acre legacy waste disposal site in Technical Area 21 that received radioactive and chemical wastes from 1944-1948. The boundary of MDA-B is only meters away from public areas. The justification for re-categorization assumes that the estimated 12.4 PE-Ci (200 g Pu-239 equivalent) total site inventory is homogeneously distributed throughout the buried waste disposal unit volume. A segmentation argument based on DOE-STD-1120 is then used to conclude that only less than HC-3 quantities of material can be exposed or disturbed at any time during controlled excavation activities. As a result of re-categorization, environmental restoration activities at MDA-B will be performed using a LANL-approved facility safety plan vice an NNSA-approved DSA and readiness will be confirmed through a lab management self assessment vice an NNSA operational readiness review.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 10, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 10, 2009

Chemistry and Metallurgy Research Building (CMR): LANL recently completed the CMR Actinide Disposition Strategic Plan that details the initiative to disposition excess (i.e., no defined programmatic use) materials currently stored in multiple locations at CMR (including the floor well storage locations in Wing 9). The plan details a disposition strategy, including processing, packaging, shipping and final destination details, for 41 different material types to be completed by October 2010. The more difficult materials that will require some processing and repackaging include neptunium-237, curium-244, americium-241/243 and uranium-233. To support the disposition strategy for most of these materials, restart of alpha box operations in the Wing 9 hot cells will be required. LANL is performing an engineering evaluation to determine the scope of maintenance and design changes (including safety basis requirements) needed for startup of the alpha box (scheduled for December).

Plutonium Facility: The plutonium facility fire suppression system is being upgraded from safety significant to safety class as a part of the on-going safety basis implementation. In accordance with a site office Safety Evaluation Report condition of approval, LANL recently submitted a gap analysis for this system against National Fire Protection Association standards 13, 25 and 72. LANL notes that despite identified non-compliant conditions, the fire suppression system is able to meet its credited safety function. This submittal also provides a proposed path forward on recommendations identified during the backfit analysis that was completed in February. A new hydraulic analysis is being performed to address several of the recommended evaluations and upgrades. LANL is developing a project plan to address the issues identified in the gap analysis and will provide this to the site office by May 31, 2009.

The site office condition of approval also requested that LANL identify Technical Safety Requirement (TSR) action statements should a sprinkler system be declared inoperable consistent with the requirements in the LANL Fire Protection Criterion 733, *Fire Protection System Impairment Control Program*. The LANL submittal recommends development of an impairment control procedure (implemented under the fire protection program) that would be used by operations center personnel to identify compensatory measures. The site office is currently evaluating this recommendation.

Radioactive Liquid Waste Treatment Facility (RLWTF): This week, LANL management presented their strategy to resume transuranic liquid waste processing at RLWTF, which has been down since 2006. A previous attempt to startup a portion of this system in November 2008 was not successful due to issues identified during the laboratory readiness assessment. The strategy now includes startup of the drum tumbler along with other transuranic liquid processing equipment. Along with the additional scope, LANL plans to implement conduct of operations (including personnel training and revising procedures) prior to startup. Based on this additional scope, the schedule for completing the management self assessment, readiness assessment and restart is now October 2009. In the interim, LANL has concluded that additional solution storage space is available in the RLWTF influent storage tanks (both acid and caustic tanks) based on ultrasonic testing. This space will allow limited aqueous chloride recovery and aqueous nitrate operations in the plutonium facility to resume.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 17, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 17, 2009

Plutonium Facility: This week, the Plutonium Facility returned to Operations mode after LANL personnel completed a re-evaluation of all unreviewed safety question (USQ) screens and determinations performed for the facility since January. This re-evaluation was prompted by NNSA site office concerns that facility management had prematurely declared that the recently approved documented safety analysis (DSA) was 'implemented' and began performing USQ evaluations against this document rather than the collection of several dozen documents that served as the facility's previous safety basis. In response, each USQ evaluation that had been performed against the new DSA was re-evaluated against the set of previous safety basis documents. The re-evaluations did not change the outcome of any USQs. Facility personnel will begin performing USQ evaluations against both sets of safety basis documents until the TSRs associated with the new DSA are verified to be fully implemented (site rep weekly 4/3/09).

Sitewide Seismic Hazards: This week, the NNSA site office approved a revision to the sitewide Justification for Continued Operations (JCO) that authorizes nuclear and high hazard operations to continue while the impacts of new information contained in the 2007 updated Probabilistic Seismic Hazards Analysis (PSHA) are evaluated. The 2007 PSHA concluded that seismic hazards at LANL are higher than previously believed. The NNSA-approved revision to the JCO deletes the requirement for additional quantitative analysis and the need for JCO coverage for 18 of the original 24 in-scope nuclear and high hazard facilities. Facility-specific rationale for exclusion was provided for each of the 18 de-scoped facilities. The approved revision also extends JCO coverage for the Plutonium Facility for one year (until June 30, 2010) to provide additional time to perform quantitative analysis of the new seismic spectra on Plutonium Facility structures, systems, and components that are credited with post-seismic safety functions. The JCO expires for the balance of facilities (WETF, RLWTF, WCRR, RANT, and CMR) on June 30, 2009, meaning that facility-specific evaluations performed under the SAFER project must be complete by that date (site rep weeklies 1/9/09, 9/12/08, 6/27/08).

Weapons Engineering Tritium Facility (WETF): WETF personnel have completed reviews of facility safety systems affected by the widespread Pressure Safety Program issues that have kept the facility in Warm Standby mode since last October. Corrective actions associated with deficiencies identified by these reviews have been categorized as either prerequisites or follow-on activities for resuming hot operations and have been vetted by LANL's institutional pressure safety committee. Prerequisites include physical system modifications to install pressure relief devices, improved administrative control of valves and system lineups, and additional personnel training.

The current safety basis requires that the maximum allowable working pressure (MAWP) of systems be known and protected. Given the incomplete technical baseline for some credited systems, the MAWP for a number of components and sub-systems cannot be readily determined. Facility management is expected to pursue a safety basis change to allow resumption of hot operations with compensatory measures to protect credited system components with indeterminate MAWPs. Timely resumption of hot operations is being sought to allow the processing of legacy tritium-bearing components known to exceed their MAWP in order to eliminate the hazard these items present.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 24, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 24, 2009

Galaska, Gerlach, Pasko, and Plaue were onsite to review the proposed Documented Safety Analysis for post-2010 operations at the Chemistry and Metallurgy Research Building. Pasko and Plaue also reviewed the safety strategy for seismically-induced fire scenarios at the Plutonium Facility.

Conduct of Engineering: Last week, LANL issued revised procedures governing system health reporting and vital safety system assessments (VSSA). These revisions are intended to incorporate lessons learned from prior experience and comments from LANL, NNSA and DNFSB reviewers.

VSSAs are a critically important tool for identifying issues that could impact the operability of credited safety systems. To assess the quality and effectiveness of the VSSA process, LANL management chartered a team of highly experienced personnel engaged through corporate reach-back to perform an independent review of VSSAs performed in FY08. This review assessed 31 VSSAs (many of which evaluated safety class systems) and determined that the operability of 18 (58%) of the assessed systems was indeterminate based on the information documented in the VSSA. Inadequate VSSAs will be re-performed using the revised procedure and review teams that are augmented with experienced personnel to provide assistance and mentoring. In the interim, lab senior management has directed Facility Operations Directors to review any potential operability issues identified by the independent team to determine if immediate actions or compensatory measures are warranted.

Chemistry and Metallurgy Research (CMR) Building: During a facility walkdown associated with this week's staff review of CMR, fixed and transient combustibles were observed in an area posted "No Combustible Storage Permitted." This area was posted because sprinkler heads associated with the safety class fire suppression system were obstructed by a large duct and had been declared inoperable. A follow-up critique concluded that TSR requirements related to sprinkler inoperability had been satisfied by removing material-at-risk from the affected areas. The critique also concluded the posting was erroneous because combustibles were allowed to be stored in these areas based on an undocumented assessment performed by a fire protection engineer. This event appears to highlight an opportunity to improve the robustness of management and control of 'affected areas' that do not meet TSR-mandated limiting conditions of operation due to inoperable safety systems or components.

Plutonium Facility: This week, LANL presented their plans for restart of the Plutonium Facility's Isotope Fuel Impact Test (IFIT) Facility to the Joint Evaluation Team (JET), which determines the LANL recommendation for level of startup review. The IFIT is used to impact (using an inert gas launcher) heat source plutonium objects to obtain data that support engineering, quality assurance and mission safety analysis. LANL began IFIT operations in 1996 following a DOE operational readiness review, but the last IFIT evolution occurred in 2001. Based on a customer need, LANL plans to restart this activity and conduct impact testing in FY10. Although subject to site office approval, the JET recommends a laboratory readiness assessment for restart of this activity. This decision is predicated on an assertion that gas launcher activities involving similar hazards and controls are currently conducted at the Plutonium Facility. Ongoing gas launcher activities are performed in a separate laboratory room using a different launcher assembly that involves different TSR-level design features.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 1, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 1, 2009

Plutonium Facility: In late-March, LANL completed the TA-55 Facility Improvement Implementation Plan for TA-55 infrastructure investment to support a long-term plutonium capability at Los Alamos. The upgrades required to transition from a passive confinement strategy to an active confinement strategy (e.g., improvements identified in the DSA) have been captured in the Safety System Upgrade Project (SSUP) and are a part of this overall plan. A project management plan for the SSUP was provided to the site office in accordance with a DSA condition of approval. This plan includes the preliminary scope definitions, execution schedules and cost estimates for 30 subprojects including ventilation system modeling and upgrades, glovebox stand seismic upgrades and fire suppression system upgrades. To support these plans, backfit analyses are required for several systems that will be upgraded to safety class. The ventilation system backfit analysis is expected to be complete in the next two months and will include evaluation against PC-3 seismic criteria.

Transuranic Waste Operations: LANL is pursuing several initiatives to increase the throughput and capability to process and ship solid transuranic waste and achieve closure of Area G by 2015. To support these initiatives, an Area G safety basis change package is under review by the NNSA site office that would allow debris waste repackaging activities involving up to 15 PE-Ci (30 times the current limit) and waste storage of up to 56 PE-Ci (120 times the current limit) of material at the Decontamination and Volume Reduction System (DVRS) Facility. No new controls are identified for higher activity repackaging and DVRS Facility storage activities in the safety basis submittal.

LANL management intends to award a contract early this month to install a debris waste repackaging line inside DVRS. LANL also plans to pursue a 2nd repackaging line at DVRS in the near future. This additional capability, along with the addition of a 2nd shift at WCRR, is expected to allow shipment of the remaining above ground debris waste drums by spring 2010. At that point, LANL intends to pursue upgrades at WCRR (e.g., glovebox fire suppression) prior to the below ground campaign. To support Area G closure, LANL is also conducting life extension studies for WCRR and RANT. The results of these studies will be factored into the plans for WCRR upgrades. Other engineering studies to determine the optimum solution for the enduring transuranic waste mission (i.e., after Area G closure) are ongoing and will be presented at the July Integrated Nuclear Planning workshop.

Additionally, there are 16 remote handled canisters stored in Area G that LANL plans to retrieve and configure for offsite shipment. The Joint Evaluation Team, which determines the LANL recommendation for level of startup review, evaluated this activity and determined that a laboratory readiness assessment (LRA) was appropriate. Based on "urgent operational needs" that appear to be driven by the schedule and availability of shipping assets managed by the Department of Energy (DOE-EM), the site office requested that LANL provide actions needed to augment the management self assessment in lieu of the previously planned LRA. In response to this request, LANL proposed several steps to strengthen the MSA including augmenting the review team with experienced off-site personnel to improve the independence of the assessment. On Friday (5/1), the NNSA site office approved the change to verify readiness to perform these activities through an MSA vice an LRA. The augmented MSA is scheduled to begin the week of May 11th.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 8, 2009

MEMORANDUM FOR: Timothy Dwyer, Technical Director
FROM: Brett Broderick/Todd Davis, LANL Site Representative
SUBJECT: Activity Report for Week Ending May 8, 2009

The site representatives were at DNFSB-headquarters in Washington, D.C. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 15, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 15, 2009

The staff held a video-teleconference with NNSA and LANL personnel to discuss the Chemistry and Metallurgy Research Building Replacement project.

Transuranic Waste Operations: This week, the site office requested an exemption to DOE Order 425.1C to allow a Management Self Assessment (MSA) to verify readiness to retrieve 16 remote handled waste canisters at Area G. The exemption request notes an assertion that the planned MSA review is essentially indistinguishable from an appropriately graded Order-compliant readiness review. The exemption request was approved by NNSA-HQ.

Consistent with the exemption request discussed above, the site office also directed that the site office manager be identified as the startup authorization authority (SAA) and that a plan of action for the MSA be submitted for approval. On Wednesday, LANL started the self assessment and completed field activities and interviews on Friday. Although some independent personnel were added to the MSA team, several of the key functional areas were assessed by facility and programmatic personnel responsible for achieving readiness and ultimately performing these activities.

The Waste Disposition Project (WDP) Program Director recently chartered a Senior Readiness Review Board consisting of laboratory senior management to evaluate an activity's readiness posture and approve the declaration of readiness in advance of formal review. For this remote handled retrieval activity, the Board met on Friday to perform this function after completion of the MSA field activities. Following resolution of MSA pre-start findings and startup approval from the SAA, this activity is planned to begin in late-May (site rep weekly 5/1/09).

Chemistry and Metallurgy Research Building (CMR): The credited CMR fire alarm system includes batteries that provide back-up power to allow the system to perform its safety function if primary facility power is lost. These fire alarm system batteries must meet requirements specified in National Fire Protection Association (NFPA) Standard 72, *National Fire Alarm Code*. Recently, CMR facility personnel recognized that the institutional procedure used to inspect and test these batteries did not include formal acceptance criteria that satisfied NFPA 72 requirements. This discovery prompted a broad extent of condition review to identify other credited fire alarm systems with back-up power supplies whose operability may be affected by the deficient institutional procedure.

In the course of evaluating CMR fire alarm system operability, facility management concluded that a table listing fire alarm control panel battery capacities in the interim Technical Safety Requirements document did not have a defensible technical basis. This discovery prompted facility management to declare a potential inadequacy of the safety analysis.

Emergency Management: LANL has established a 24 hour-a-day, 7 day-a-week Emergency Operations Support Center, staffed by trained personnel, to create a single point of contact for reporting and dispositioning non-life threatening abnormal events or conditions at the laboratory.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 22, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 22, 2009

Plutonium Facility: To improve the safety posture of Pu-238 enriched heat source plutonium (HS-Pu) stored at the Plutonium Facility, LANL management intends to demonstrate, by June 2010, that all HS-Pu storage containers can perform a safety class containment function without requiring heat removal from the vault water bath. Achieving this end state will require repackaging a fraction of the HS-Pu material into safety class containers, overpacking some existing non-safety class containers, and analytically demonstrating that others can meet safety class functional requirements. In the interim, actions are being taken to improve the level of protection for non-safety class containers that continue to require cooling from the vault water bath. One such action is the development of an emergency operating procedure to deal with hardware failures that could result in water loss from the system. This procedure is expected to formalize response actions to isolable system leaks, non-isolable but patchable system leaks, and catastrophic breaches where the baths cannot maintain required water levels (site rep weekly 3/27/09).

This week, the site office approved the implementation plan for the Documented Safety Analysis that was approved in December 2008. The plan divides the control set implementation into four groups with the first Implementation Validation Review scheduled to begin this month. Overall control implementation is scheduled to be complete in March 2010.

Transuranic Waste Operations: In April, a panel of subject matter experts reviewed a draft of the new Area G Basis for Interim Operations (BIO) and provided recommendations to improve document quality and DOE Order compliance. The panel recommended modifying the hazard analysis methodology, applying DOE-Standard-5506, *Preparation of Safety Basis Documents for Transuranic Waste Facilities*, and revising dispersion calculations. This week, LANL management delivered to the NNSA site office a resource loaded schedule for implementing these recommendations. The schedule shows the revised BIO being delivered to NNSA for final review on September 30, 2009.

Last week at the WCRR repackaging facility, an operator observed sparks during an evolution that involved opening and repackaging small vials containing poorly characterized radioactive solids and powders. The operator stopped work and after consultation with facility management, deliberate actions were taken to establish a safe and stable condition. While the cause of the sparks is not yet known, markings on some containers involved in the evolution suggest that the vials may contain pyrophoric material. The WCRR BIO does analyze hazards associated with pyrophoric materials and specific administrative controls are identified to furnish the glovebox with a fire blanket and carbon spheroids and to ensure operators are trained in their use to extinguish small fires. However, the WCRR glovebox is not inerted and although future upgrades are planned, it is not currently equipped with automatic fire suppression. WCRR management has suspended the movement and processing of drums with similar contents pending the results of additional investigation.

Fire Protection: This week, the site office approved the recently completed baseline needs assessment that addresses fire department emergency response services. The site office requested an implementation plan to address the 15 recommendations identified in the assessment by August 2009.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 29, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 29, 2009

The staff held a teleconference with NNSA and LANL personnel to discuss decontamination, decommissioning and environmental restoration activities at TA-21.

Management: The laboratory is establishing a new Facility Operations Director position to oversee the TA-21 work scope that has been accelerated via the American Reinvestment and Recovery Act.

Weapons Engineering Tritium Facility (WETF): Hot operations have not been performed at WETF since pervasive pressure safety issues were recognized last October. During this interval, significant effort has been applied to characterizing and correcting pressure safety deficiencies associated with credited safety systems. Despite these efforts, a number of unresolved issues continue to prevent compliance with existing TSR-level Pressure Safety Program requirements.

During this quiescent period, facility personnel also recognized that some legacy tritium-bearing components stored at WETF may have built up sufficient internal pressure to challenge and potentially breach their containment. Processing these legacy units to eliminate this hazard requires the facility to enter Operations mode, which is currently prohibited due to the TSR non-compliances noted above. This week, LANL submitted proposed TSR revisions that would allow the LANL Pressure Safety Committee to approve acceptable compensatory measures where TSR-level pressure safety requirements cannot be met. The proposed revisions would also lower the WETF facility MAR limit from 560 g to 400 g and reduce the MAR allowed in the Tritium Gas Handling System from 150 g to 100 g (site rep weeklies 4/17/09, 2/13/09, 1/23/09, 12/19/08, 11/28/08, 11/21/08, 10/17/08).

Plutonium Facility: This week, a criticality infraction was declared at the plutonium facility when a plutonium metal sample was identified in a glovebox that was only analyzed and posted for plutonium oxide. Following evaluation by criticality safety engineering, the material was removed from the glovebox. The metal sample was originally placed in the glovebox several years ago in compliance with criticality safety requirements at that time. The glovebox limits were subsequently changed to require oxide only; however, presence of the metal sample that did not comply with the revised limit was not identified at that time. Based on this issue, facility management plans to revise their criticality procedure to require verification of field compliance whenever new or revised limits are established.

Transuranic Waste Operations: On Wednesday, the site office manager authorized the startup of retrieval and loading operations for 16 remote handled transuranic waste containers following review of closure packages associated with the Management Self Assessment pre-start findings. The startup approval included the following 4 conditions of approval: 1) evaluation of programmatic deficiencies and root causes for pre-start findings, 2) treatment of several observations as post-start findings, 3) review of issues associated with implementation of the unreviewed safety question process and 4) evaluation of training records for Area G supervisory personnel (expired or incomplete training not specific to this activity was identified by the site office for some Area G supervisors). A corrective action plan is required for each of these conditions of approval. On Thursday, LANL successfully retrieved the first canister and loaded it into a cask for shipment to the Waste Isolation Pilot Plant.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 5, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 5, 2009

This week, the staff held a conference call with LANL and site office personnel to discuss safety basis changes and resumption of tritium processing operations at the Weapons Engineering Tritium Facility.

Federal Oversight: The NNSA Chief of Defense Nuclear Safety began their two week biennial review of LANL safety programs this week. In addition to evaluating corrective actions for issues that were identified in 2007, the team is focusing on safety system and startup/restart oversight.

Transuranic Waste Operations: This week, LANL began their implementation assessment for conduct of operations and maintenance following facility declaration of implementation at the WCRR repackaging facility and the RANT shipping facility. The LANL team expects to complete their review and provide a recommendation in the next two weeks.

Weapons Engineering Tritium Facility (WETF): Resumption of processing operations at WETF is needed to support disposition of legacy tritium-bearing components that have built up sufficient pressure to challenge their containment. To support a return to operations, LANL had planned to perform a Management Self Assessment (MSA) that would address hardware, procedure and personnel changes, implementation verification review for safety basis changes and independent management observation verifications for conduct of operations chapters that have been implemented. This week, these plans were reviewed by the Joint Evaluation Team (JET), which determines the LANL recommendation for level of startup review. The JET concluded that the planned approach for performing a MSA was appropriate.

Plutonium Facility: In October 2008, LANL declared a Potential Inadequacy of the Safety Analysis (PISA) based on hazards associated with hydrogen generation for weapons-grade plutonium aqueous processing operations. LANL subsequently concluded that an unreviewed safety question existed based on this issue and submitted an evaluation of the safety of the situation (ESS) in February. An active purge for appropriate process vessels was established as a compensatory measure. This week, the site office directed LANL to incorporate appropriate description and analysis for this hazard in the next annual update of the documented safety analysis, which is due in December 2009.

In March, LANL declared a PISA based on the presence of an unvented transuranic waste container that could pose hazards not analyzed in the safety analysis. This issue was subsequently declared an unreviewed safety question and an ESS was submitted to the site office; however, a justification for continued operation or safety basis revision has not been requested. This week, the site office directed LANL to determine a method to resolve this issue and submit appropriate safety basis revisions for approval within the next four weeks.

Formality of Operations: This week, the site office approved a revision to the implementation criteria for Conduct of Engineering. Notably, the revised criteria do not require completion of assessments for all vital safety systems prior to declaring implementation. Instead, the lines of inquiry focus on adequate implementation of the processes.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 12, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 12, 2009

Andersen, Bamdad, Batherson, Hadjian, Kasdorf, Kimball, Pasko, and Spatz were onsite this week to review aspects of the Chemistry and Metallurgy Research Building Replacement Project.

Federal Oversight: This week, the Chief of Defense Nuclear Safety (CDNS) completed a review of LANL nuclear safety performance and NNSA site office management/oversight of nuclear safety. Initial feedback from the team was that overall performance had significantly improved since the 2007 CDNS review. However, two Management Concerns (i.e., “a significant issue, or collection of similar issues, that indicates a systemic problem”) were identified. The team noted that site performance in the functional area of readiness did not meet expectations and that the site office has not executed its delegated startup authority in a manner that ensures compliant performance. The team recommends that NNSA Headquarters take immediate action to address this issue. For the maintenance functional area, the team concluded that a compliant maintenance safety management program has not been fully implemented for LANL nuclear facilities and that LASO oversight in this area is not adequately planned and executed.

Radioactive Liquid Waste Treatment Facility (RLWTF): On Monday, a filter system associated with the low-level waste processing system failed resulting in the release of approximately 500 gallons of contaminated liquid waste at RLWTF. The low-level liquid waste spill was limited to one room of the facility and collected in a sump. Low-level waste processing was suspended to address the spill and perform corrective maintenance. The failure mode appears to be cracking of a plastic connection assembly (there are over 300 of these connectors associated with this filter). This same failure mode caused a similar event in October 2008. During inspections this week, 9 additional cracked connectors were identified and replaced. LANL is pursuing corrective actions including information from the vendor and identification of appropriate preventive maintenance.

To address low-level waste processing outages (such as the one described above) and ensure adequate influent storage, LANL recently developed a graded protocol for low-level liquid waste generators that helps reduce influents when storage capacity is low. The least restrictive level of the new protocol was effected this week, requiring generators to take certain actions (e.g., limit safety shower testing and facility mopping) which aided the facility in maintaining sufficient influent storage capacity.

Plutonium Facility: This week, LANL submitted for NNSA review and approval a justification for continued operations (JCO) that would remove existing operational restrictions that prohibit removal of non-safety class heat source plutonium containers from the vault water bath. The JCO proposes a specific administrative control that limits the total time a non-safety class container may be removed from the vault water bath and placed in temporary baths to eight hours and limits the time a non-safety class container may be removed from all water cooling to one hour. An approved JCO is required to radiograph and evaluate a set of poorly characterized non-safety class containers in the near-term, and to support plans for the ultimate remediation of the entire population of non-safety class heat source plutonium containers by June 30, 2010 (site rep weeklies 5/22/09, 3/27/09).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 19, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 19, 2009

The staff held a teleconference this week with NNSA and LANL personnel to discuss the Chemistry and Metallurgy Research Building Replacement Project.

Engineering: LANL recently achieved a significant milestone in strengthening its engineering program and coming into compliance with DOE expectations. Every vital safety system at LANL now has an assigned cognizant system engineer (CSE) and each system's CSE has completed at least an interim level of qualification. Significant work remains to improve the overall maturity and effectiveness of the CSE program. However, the sustained management attention and resource allocation being devoted to recruiting, training and qualifying CSEs is establishing the foundation necessary to achieve the critically important goal of improving and maintaining confidence in the efficacy of LANL's vital safety systems (site rep weekly 12/5/08).

Contractor Assurance: Last week, a 'facility-centered' Director's Independent Assessment began at the Chemistry and Metallurgy Research Building. Eighteen functional areas (including engineering, operations, maintenance and safety basis) will be evaluated using formal criteria, review and approach documents. This is the first 'facility-centered' Director's Assessment performed by the laboratory since FY07. These assessments are intended to provide independent, broad-based evaluation of a facility's compliance with DOE requirements (site rep weeklies 10/24/08, 10/17/08, 5/23/08).

Sitewide Seismic Hazards: LANL continues to evaluate the impacts of the 2007 updated Probabilistic Seismic Hazards Analysis (PSHA) on structures, systems and components (SSCs) in nuclear facilities. As approved by the site office in April, the Justification for Continued Operations (JCO) that covers this multi-facility issue expires on June 30, 2009 for WETF, RLWTF, WCRR, RANT and CMR and on June 30, 2010 for the Plutonium Facility.

Last week, LANL requested a 5 month JCO extension for the facilities scheduled to expire in June 2009 (i.e., to November 2009) to accommodate an increased need for site subject matter experts in seismic and structural areas to support the CMR Building Replacement Project. For each of the facilities identified above, LANL plans to 1) perform quantitative seismic analysis of SSCs, 2) develop a facility-specific JCO, if required based on the analysis, 3) revise the safety basis, if required, and 4) identify modifications/upgrades to address deficiencies (site rep weeklies 4/17/09, 1/9/09, 9/12/08, 6/27/08).

Transuranic Waste Operations: The NNSA site office recently approved the annual updates of the WCRR repackaging facility Basis for Interim Operation and Technical Safety Requirements. In addition to including previously approved safety basis revisions, the update includes the following notable changes: use of ICRP 72 dose conversion factors; changes to the TSR minimum staffing level and; revision to the WCRR acceptance criteria to allow transuranic waste containers with headspace hydrogen concentrations up to 4%. The site office approval letter reiterates that operations in the waste characterization glovebox that exceed 300 PE-Ci will require a safety basis change and installation of an NFPA Standard 801-compliant automatic fire extinguishing system.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 26, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 26, 2009

Davis was offsite this week.

Readiness: This week, NNSA Headquarters issued a letter directing the site office to take a number of corrective actions to address readiness issues identified during the recent Chief of Defense Nuclear Safety Biennial Review. One corrective action requires NNSA Headquarters (NA-17) review and comment prior to approval of key readiness-related documents and decisions, including Startup Notification Reports and authorization to startup or restart hazard category 2 nuclear facilities or activities. The site office must also provide documents describing all activities under consideration for possible startup and restart action to NA-17. The need to maintain these corrective actions will be evaluated by NNSA Headquarters personnel in six months (site rep weekly 6/12/09).

Transuranic Waste Operations: A TSR violation was declared this week at the WCRR repackaging facility for failure to perform required actions when a limiting condition of operation for the fire suppression system (FSS) could not be met. The safety significant WCRR FSS relies on water supplied by the laboratory's sitewide water distribution system that feeds domestic water and fire protection systems in nuclear and non-nuclear facilities across the site. Last week, the Los Alamos County Fire Department (LACFD) performed a fire hydrant flow test in the vicinity of the WCRR facility. This test caused water pressure in the system to drop below the level required for the WCRR FSS to be operable. Although LACFD contacted LANL representatives (including the WCRR Operations Center) prior to testing, WCRR facility personnel did not recognize the TSR implications of the hydrant flow evolution and did not perform required actions to mitigate risks resulting from the safety system impairment.

Since a number of LANL nuclear facilities rely on the sitewide water distribution system to support their credited fire suppression systems, weaknesses in test coordination and facility response protocols could cause similar issues elsewhere. LANL management appears to understand the institutional scope of this issue and has initiated steps intended to improve awareness at nuclear facilities of upcoming LACFD tests and the appropriate response actions required when these tests occur.

Plutonium Facility: Three drum-sized containers staged in the Plutonium Facility basement were recently recognized to be unvented. These legacy containers hold plutonium that is in contact with hydrogenous material. This configuration could result in hydrogen gas being produced via radiolysis, which over time could create a flammable environment inside in the unvented container. Facility management declared a potential inadequacy of the safety analysis (PISA) because it is not clear that this type of hydrogen deflagration hazard is analyzed in the facility safety basis. The affected containers have been cordoned off and an isolation area has been established around them.

This situation has parallels to a PISA declared in March involving the discovery of an unvented legacy transuranic waste container that had also been staged in the Plutonium Facility basement for many years. Both situations were identified by the same NNSA Facility Representative. Facility personnel intend to conduct an extent of condition review to find and address any other unvented containers that may reside in the Plutonium Facility basement (site rep weekly 3/6/09).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 3, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 3, 2009

Transuranic Waste Operations: This week, LANL successfully completed the campaign to retrieve sixteen remote handled transuranic waste canisters from underground storage at Area G and ship them to the Waste Isolation Pilot Plant (site rep weeklies 5/29/09, 5/15/09 and 5/1/09).

Also at Area G, operators in the Dome 231 Permacon recently began processing low-activity drums containing debris waste forms. Until several weeks ago, the Permacon had been used to remove free liquids from very low-activity (less than hazard category 3) drums containing non-dispersible solidified waste forms. The new campaign involves transferring bagged debris waste from degraded or suspect drums into new, compliant drums for disposal at WIPP. These activities do not involve any sorting or segregating of the debris waste and inventory limits remain below the hazard category 3 level. Personnel protective equipment, including a respirator, is relied on to protect workers from hazards associated with the contaminated debris waste. This new activity is the first step in the lab's plans for increased use of the Permacon to perform open-drum processing activities that will eventually include sorting operations with higher-activity debris waste to increase LANL's legacy waste disposition rate (site rep weekly 5/1/09).

Plutonium Facility: The site office approved a justification for continued operation (JCO) this week that provides the safety basis to allow movement, handling and radiography of non-safety class heat source plutonium containers. The JCO includes compensatory measures that will be implemented as specific administrative controls to limit the time non-safety class containers will be removed from the vault water bath and subject to increased temperatures due to self heating. The JCO also includes implementation of a daily surveillance of the vault water bath to ensure non-safety class containers are covered by at least one inch of water. This control was previously required by a standing order and is also included in the new Documented Safety Analysis that has yet to be implemented. The JCO now formalizes this control and ensures earlier implementation (site rep weeklies 6/12/09, 3/27/09).

There are two particularly large non-safety class containers that have been stored under water in a sink outside of the vault. The JCO retains the previously identified compensatory measure to perform a daily surveillance to ensure these containers remain covered with water. The JCO allows seven days after implementation to either open the containers in a glovebox or reconfigure the vault water bath to support storage of these containers. LANL has also successfully completed qualification activities, including drop testing, of a new robust container called the Fuel Storage Outer (FSO). The JCO approves the use of FSOs as safety class containers for overpacking and storing heat source Pu.

Chemistry and Metallurgy Research Building (CMR): This week, LANL presented the preliminary results from the recent Director's Independent Assessment of CMR facility operations. Overall, the team concluded that CMR was operated in a safe and secure manner due to the commitment and performance of CMR's facility and programmatic personnel. The review team did note staffing shortages in several areas (e.g. engineering, fire protection, emergency preparedness) that may impact the sustainability of compliant operations. The team also noted system and equipment inadequacies, with the fire protection systems in particular, and a lack of clarity and

formality for a facility SAC and some safety management programs (site rep weeklies 6/19/09, 10/24/08).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 10, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 10, 2009

Technical Area-35 (TA-35): On Wednesday, an Operational Emergency was declared following an energetic chemical reaction at a radiological facility in TA-35. A student had been cleaning small sample vials with acetone. Although unsure of the proper disposal method for the acetone (approximately 30 mL), the student poured it into an acid waste storage container because the sample vials had originally contained trace amounts of nitric acid. The student had not been briefed on the work control document governing this activity and the student's assigned mentor was not present when the acetone was discarded. Later, after the student had left the laboratory, an energetic exothermic reaction took place breaching the primary and secondary acid waste storage containers as well as a bottle containing approximately 2 L of nitric acid in an adjacent acid storage cabinet that had been jarred open by the event. Two workers were in the lab room at the time and exited the area after hearing a loud noise and seeing spilled liquid. These workers re-entered the room to apply a spill kit to the chemicals on the lab room floor and exited again after observing the open acid storage cabinet and realizing the extent of the damage. The event did not impact any radiological material at the facility.

LANL Emergency Management, the LANL Emergency Response Hazardous Materials response team, and the Los Alamos County Fire Department were all notified and responded. As responders were planning and staging equipment to enter the room, they observed brown fumes evolving from the spilled chemicals and being swept through an operating fume hood that exhausted out the facility stack. Recognition of this stack release prompted the declaration of an Operational Emergency. After some complications caused by uncertainty over exactly what chemicals were stored in the breached acid cabinet, responders re-entered the room in appropriate personnel protective equipment and stabilized the scene.

The two workers who initially re-entered the room were taken to Los Alamos Medical Center for evaluation and released without restriction. Their potential level of chemical exposure is being assessed. An investigation into this event will determine root causes and corrective actions.

Weapons Engineering Tritium Facility (WETF): This week, LANL submitted safety basis changes for site office approval to support a return to Operations mode to allow limited tritium de-inventory and MAR reduction activities. These changes supersede Technical Safety Requirement (TSR) changes previously submitted in late-May. LANL now plans to approach the WETF return to Operations mode in two phases. The first phase, which is supported by the safety basis changes submitted this week, only involves the overpacking and shipping of tritium containers outside of tritium pressure systems (i.e., no operations involving the tritium gas handling system or introduction of greater than residual amounts [1.6 g] of tritium into gloveboxes). This initial safety basis change also resolves inconsistencies between the TSRs and the WETF safety analysis report. Following site office approval and facility implementation, LANL plans to perform an Implementation Verification Review prior to performing these limited de-inventory activities. The second phase includes operation of the tritium pressure systems that were subject to the pressure safety issues recognized in October 2008. The safety basis changes and level of readiness determinations needed to support phase 2 operations that involve gas transfers are under development. (site rep weekly 5/29/09).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 17, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 17, 2009

Board member Bader and staff members Anderson and Moury were onsite this week to observe an Integrated Nuclear Planning workshop. Key topics discussed during this workshop included the projects and plans to support current and long-term solid and liquid transuranic waste missions.

Plutonium Facility: This week, LANL successfully completed the implementation verification review for the controls identified in the Justification for Continued Operations (JCO) that support the movement, handling and radiography of non-safety class heat source plutonium containers. Following implementation and consistent with the requirements in the JCO, LANL relocated the two particularly large non-safety class containers that have been stored in a laboratory room sink to a facility glovebox. These containers were then opened, eliminating any over-pressurization hazard they could have posed. LANL also began overpacking other non-safety class containers into the DOE Nuclear Material Packaging Manual (DOE M 441.1-1)-compliant Fuel Storage Outer containers that were approved as safety class by the recent JCO. The approved JCO also allows other miscellaneous non-safety class container types to be radiographed to provide information needed to determine their ability to survive internal pressurization challenges when not afforded water cooling (site rep weeklies 7/3/09, 6/12/09).

Radioactive Liquid Waste Treatment Facility Replacement (RLWTF-R) Project: LANL is approximately 60% complete with the design effort for this project and has revised the Preliminary Documented Safety Analysis. These products are currently being reviewed by the federal project team with a Technical Independent Project Review planned for October and Critical Decision-2 targeted for May 2010. One important unresolved decision affecting this project is how to provide 100,000 gallons of low-level liquid waste influent storage capacity, which is not included in the current design.

Waste Management Risk Mitigation (WMRM) Project: The WMRM Project was intended to establish a 300,000 gallon low-level liquid waste storage capability in TA-50 that could be used under emergency conditions, like those encountered during the Cerro Grande fire. Work on a Hazard Category 2 tank farm facility proceeded until April 2007, when the WMRM project was halted at the 75% construction completion phase due to significant project management and quality assurance issues. A re-design of the liquid waste receipt tie-in point precluded the introduction of transuranic liquid waste into the tank farm facility. Subsequent approval was granted to complete the WMRM project as a radiological facility that would include only very rudimentary facility systems and could be used only in emergency situations, primarily to receive and store low-level liquid waste. Last month, the project identified enough remaining funds to add scope to install fire suppression, fire alarm, emergency lighting, lightning protection and mechanical ventilation systems. Additionally, in May NNSA approved an equivalency allowing the installed WMRM receipt tanks to be used for liquid storage at the radiological level, although they are constructed of a combustible fiberglass reinforced plastic material. Given these developments, a portion of the installed WMRM tank space is now being strongly considered as a way to provide the low-level influent storage capacity needed by the RLWTF-R, as discussed above. Changing the RLWTF-R project baseline to reflect a reliance on WMRM for low-level influent storage will require formal approval by NNSA, which has not yet

been requested by LANL (site rep weeklies 8/15/08, 3/14/08).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 24, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 24, 2009

Emergency Management: On Thursday, LANL conducted its annual full scale emergency exercise. The exercise simulated an explosion in the Beryllium Technology Facility foundry resulting in several worker casualties and a release of Beryllium from the facility. At one point, the exercise had to be paused for several hours when key participants including Los Alamos County Fire Department, LANL Emergency Response and LANL Emergency Management personnel were called away to deal with an actual hazardous material event, discussed below. Work has begun on an exercise after-action report that will analyze performance and identify opportunities for improvement.

Target Fabrication Facility: The event that led to the pause in the full scale exercise occurred at the Target Fabrication Facility, a radiological facility in Technical Area 35. A worker was transferring a nitric acid solution into a shipping container to prepare it for disposition when an unexpected chemical reaction occurred causing reddish fumes to begin evolving from the container. The worker became concerned that an exothermic reaction occurring inside the shipping container could cause it to fail, so he attempted to transfer the reacting solution into a more robust container. During this attempted transfer liquid began to bubble out of the container. At this point the worker left the room and prompted a facility evacuation. The facility evacuation was complicated by the evacuation alarm being out of service. Also, one individual had not been issued a facility emergency notification pager and remained unaware of the situation and inside the facility for a significant period of time.

Incident command decided to order adjacent facilities in TA-50 to shelter-in-place to protect personnel from exposure to any chemical vapors being exhausted from the Target Fabrication Facility through an unfiltered stack. Notification to shelter-in-place does not appear to have been effectively communicated to all impacted TA-50 facilities, including the WCRR repackaging facility.

Ultimately a hazardous materials team made entry into the facility and stabilized the scene. Fourteen workers, including the individual directly involved in the event were transported to Occupational Medicine where they were examined and released without restriction. The direct cause of the chemical reaction that initiated the event is still under investigation. In part due to similarities with the July 8th exothermic chemical reaction event at another TA-35 facility, the Material Science and Technology division has paused operations involving chemicals, pending reviews of work control documents and walkdowns of laboratory spaces where work with chemicals is performed (site rep weekly 7/10/09).

Formality of Operations: This week, the RANT shipping facility and the WCRR repackaging facility declared 'core' implementation of Conduct of Engineering. RANT and WCRR are the first operating nuclear facilities to complete core implementation of Conduct of Engineering and are also the first nuclear facilities to have declared the set of Conduct of Operations, Maintenance and Engineering as implemented. An independent verification review of Conduct of Engineering at RANT and WCRR is scheduled to begin next week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 31, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 31, 2009

Federal Oversight: At the request of NNSA-Headquarters, a review of the implementation of DOE-STD-1189, *Integration of Safety into the Design Process*, for LANL projects was conducted in conjunction with the Chief of Defense Nuclear Safety review in June 2009. The results of this review were recently communicated to the site office. The review concluded that LASO is using contract performance based incentives and other mechanisms to drive implementation of DOE-STD-1189 and improvements in the integration of safety into design; however, additional elements of the LANL contractor assurance system could be better utilized. The review identified the following 3 weaknesses: 1) lack of a schedule/plan for appropriately incorporating DOE-STD-1189 into institutional processes and procedures, 2) inconsistent and ineffective performance of a gap analysis for each nuclear project and 3) incomplete use of all elements of the contractor assurance system to effectively drive implementation of the standard for all nuclear projects.

Chemistry and Metallurgy Research (CMR) Building: In January, LANL submitted a Documented Safety Analysis (DSA) and associated Technical Safety Requirements (TSR) for post-2010 operations in the CMR Building. Following initial site office review, the site office provided the following significant issues (partial list) to LANL: 1) the hazards analysis methodology is incomplete and may not be consistent with DOE-STD-3009, 2) control selection that does not appear consistent with DOE-STD-3009 (identification of safety management programs as controls versus engineered controls and/or specific administrative controls), 3) inadequate TSR derivation from hazard and accident analyses and 4) concerns with the fire accident modeling and consistency between the DSA and Fire Hazards Analysis (FHA). The site office requested LANL to resolve these issues and to submit an updated hazards analysis in August 2009. This week, LANL submitted a request to extend the resubmission of the CMR DSA/TSRs until December 2009. The extension notes that a revised hazard analysis is well underway and is expected to be complete by the end of September. The DSA/TSRs will then be revised based on the updated and improved hazard analysis (site rep weekly 2/13/09).

Plutonium Facility: This week, the site office approved TSR changes submitted by LANL that address non-safety class heat source plutonium (HS-Pu) container storage in the vault water bath. These TSR changes specifically require that water level in the vault water bath be one inch above all non-safety class HS-Pu containers with a daily surveillance and a surveillance following any container movement. In addition, the changes provide actions for conditions when the vault water bath is unable to contain water. LANL also continues actions to repackage HS-Pu into pedigreed safety class containers and to better characterize other miscellaneous containers (site rep weeklies 7/3/09, 6/12/09, 3/27/09).

The site office also approved a delay in the submittal of the TA-55 FHA to August 2009. A condition of approval in the safety evaluation report required a revised FHA to be submitted in June with subsequent DSA integration during the annual update. LANL still intends to incorporate the results of the revised FHA into the DSA during the next annual update.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 7, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 7, 2009

Transuranic Waste Operations: Last week, LANL declared a Potential Inadequacy of the Safety Analysis at the RANT shipping facility based on the discovery of smoke and heat detectors that do not comply with National Fire Protection Association (NFPA) Standard 72 requirements. The issue was identified during a site office safety system oversight review of the RANT safety significant fire suppression system. The current location of smoke and heat detectors on the bottom of facility beams and detector coverage reduction based on ceiling height are not in compliance with NFPA 72. This standard is specifically cited in the RANT safety basis for the fire detection system. This week, LANL submitted a Justification for Continued Operation (JCO) that includes a compensatory measure for a fire observer, specifically trained to perform a periodic walk-through (once every 30 minutes), to be present whenever MAR is inside RANT (excluding MAR inside a Type B container).

LANL also recently submitted safety basis changes for Area G that support Sort, Segregate, Size Reduction and Repackaging (SSSR) activities involving transuranic waste at Area G. The change allows up to five structures (e.g., the TA-54-412 building and dome structures) to be used with individual MAR limits of 2.5 PE-Ci equivalent combustible waste (previously limited to 0.47 PE-Ci) and an overall Area G MAR limit of 12.5 PE-Ci. LANL estimates that approximately 90% of the roughly 14,000 remaining above ground containers contain less than 2.5 PE-Ci. Existing radiation protection program requirements specify methods for minimizing contamination spread during SSSR activities (e.g., use of a Perma-Con or other containment control enclosure). LANL plans to submit an implementation plan that includes details for MAR tracking within 30 days of site office approval.

Radiological Work Control: Several weeks ago, an irradiated target from the Los Alamos Neutron Science Center (LANSCE) was transferred to the Radiochemistry Facility (RC-1) and chemically processed in an RC-1 hot cell to create a sample of radioactive arsenic (As-73 and As-74) needed for an activity back at LANSCE. The radiation work permit (RWP) used for handling the As sample assumed hazards would be dominated by gamma radiation, so dose rate limits and controls were gamma-based. When the As sample was removed from the RC-1 hot cell, an RCT took several dose rate measurements. Gamma measurements were below the RWP limit of 5 rad/hr at 30 cm, but a measurement that accounted for both gamma and beta radiation indicated a combined dose rate of about 30 rad/hr at 30 cm. Since the gamma-based RWP limit was not exceeded, work continued to handle and package the sample for shipment to LANSCE. Some attempt was made to communicate the radiation levels between RC-1 and LANSCE. However, when the sample was received at LANSCE, the researcher who unpackaged the sample was unaware of the high beta dose rate. As a result, the researcher manually handled the sample, putting his gloved hands in proximity to the highly radioactive As for roughly 30 seconds. The researcher was not wearing a wrist dosimeter because it was not required by the RWP. This week, the facility operations directors for LANSCE and RC-1 became aware of these events and initiated follow-up investigation, including a dose reconstruction for the LANSCE researcher's extremities. Among other things, this event appears to highlight opportunities for improvement in the identification of hazards during the work planning and RWP development processes, as well as, personnel responses upon discovery of new or unexpected hazards.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 14, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 14, 2009

Staff members J. MacSleyne, J. Pasko and R. Verhaagen along with outside expert D. Volgenau were onsite this week to review activity-level work planning and control.

Plutonium Facility: On June 24th, Plutonium Facility management declared a potential inadequacy of the safety analysis (PISA) based on an NNSA facility representative's discovery of three unvented 55-gallon assay standards staged in the facility basement. These unvented standards contain plutonium in contact with hydrogenous material that could evolve hydrogen gas and create an explosive atmosphere inside the sealed drum, creating a potential deflagration hazard. To address the PISA, facility management established a compensatory measure to cordon off, post, and prohibit handling of the unvented standards, as well as, a compensatory measure to relocate 16 transuranic waste drums that were immediately adjacent to the unvented standards. On July 1st, the three unvented standards resulted in a positive unreviewed safety question (USQ), thereby requiring NNSA approval before compensatory measures could be lifted. Subsequent to the positive USQ determination, facility personnel realized that eight of the sixteen palletized transuranic waste drums collocated with the unvented standards could not be accessed by a forklift without handling the unvented containers. As a result, eight transuranic waste drums remain within about one foot of the unvented standards. On Tuesday, a formal evaluation of the safety of the situation (EOSS) was submitted to the NNSA site office. The EOSS concludes that existing compensatory measures related to cordoning off and proscribing handling of the unvented standards should remain in effect and that the eight collocated transuranic waste drums could remain in place until further options are evaluated.

Compensatory measures established to address PISA conditions are identified by LANL procedures as part of a nuclear facility's safety basis. The current Plutonium Facility Safety Basis Document List (SBDL) does not capture the compensatory measures related to the unvented standards, as required. Effective configuration control of the Plutonium Facility SBDL has been a recurring problem.

Chemistry and Metallurgy Research Building (CMR): Last week, LANL submitted temporary safety basis changes associated with use of an alpha box (a confinement enclosure used for dispersible materials located in the Wing 9 hot cells) to repackage seven legacy items. This activity is part of the effort to de-inventory actinide materials (including Cm, Am, Np, and U) currently stored in Wing 9 floor wells by the end of 2010. The existing safety basis credits alpha box ventilation and HEPA filters during hot cell processing activities that involve dispersible materials. The LANL submittal recommends eliminating the safety basis controls specifically associated with alpha boxes inside of hot cells because of the limited amount of material planned to be processed, the limited time at risk (estimated to be approximately 4 weeks) and the availability of other credited hot cell confinement features. LANL asserts that the hot cells and associated exhaust ventilation HEPA filters provide credited filtration and adequate controls for the planned activity. However, to limit the spread of contamination in the hot cells, LANL does plan to use an alpha box with its existing HEPA filter (that cannot be tested) along with a temporary blower and additional non-credited HEPA that discharge into an adjacent hot cell. The NNSA site office is reviewing the proposed safety basis change.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 21, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 21, 2009

Transuranic Waste Operations: Last week, a transuranic waste drum was mistakenly transferred from Area G to WCRR. The identification number on the mis-transferred drum was one digit different than the drum that was intended to be sent to WCRR. Six separate proceduralized verification checks on the drum identification number, performed by three different organizations, all failed to discover the discrepancy. The mis-transferred drum violated Transportation Safety Document TSRs during onsite shipment and WCRR TSRs when it was introduced into the facility.

Also last week, personnel performed preventive maintenance inside WCRR using two lubricants while the facility was in Warm Standby mode. Both lubricants are categorized as flammable liquids. The work planning and approval process did not recognize that using these flammable liquids inside the facility while inventory was present would violate a limiting condition of operation (LCO) associated with the combustible loading TSR control. As a result, the applicable LCO was never entered, as required. Action statements associated with the combustible loading LCO require inventory to be placed in a safe configuration immediately and require a fire patrol to be established within two hours. Facility management asserted that inventory remained in a safe configuration (i.e. inside sealed Type A waste drums) throughout the evolution and that the flammable liquids remained in the facility for less than two hours. Because no action statement completion times were exceeded (albeit fortuitously), facility management concluded that this event did not constitute a TSR violation.

Finally, during transuranic waste operations on Wednesday, an airborne contamination release occurred in the WCRR processing area causing multiple continuous air monitor (CAM) alarms (the highest CAM measurement exceeded 3300 DAC-hrs). All eight personnel in the area were wearing anti-contamination personnel protective equipment (PPE), including respirators. Personnel responded per procedures to place work in a safe configuration and exit the area. Although PPE contamination was identified on 5 of the 8 workers, surveys indicated no skin contamination and subsequent nasal smears were negative. Based on PPE contamination identified on operators and subsequent facility surveys, it appears that the release occurred as operators were overpacking an empty 55 gallon drum whose contents had been removed, sorted and placed in a daughter drum. It appears likely that the plastic sleeve and tape used on the 55 gallon drum for contamination control failed during the overpacking activity. Given the extent of contamination spread, facility decontamination efforts are expected to continue into next week.

Weapons Engineering Tritium Facility (WETF): Implementation of safety basis changes and other readiness activities to allow limited operations that do not involve the tritium gas handling system are in progress. Resumption of these limited operations will support inventory reduction and will allow overpacking (in credited secondary containers or gloveboxes) of approximately 70 containers that may exceed their maximum allowable working pressure and do not currently have any secondary confinement. These limited operations are scheduled to begin in September. The NNSA site office is also reviewing safety basis changes that would support tritium gas handling system activities. A Laboratory Readiness Assessment is planned to support resumption of this activity in October.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 28, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 28, 2009

Transuranic Waste Operations: Last week, a transuranic waste drum with a small hole in the bottom was transferred from Area G to the WCRR repackaging facility. A required drum integrity inspection at Area G failed to identify the hole, which was ultimately discovered during a more thorough receipt inspection at WCRR. Onsite shipment of a degraded waste drum resulted in a Transportation Safety Document (TSD) TSR violation. Upon discovery of the hole, separate TSD and WCRR TSR controls prohibited the drum from either being shipped back to Area G or being introduced into WCRR (which was still undergoing decontamination from a prior event). As a result, a LANL HAZMAT team was called in to overpack the degraded drum in the WCRR parking lot.

This week at Area G, an NNSA facility representative identified a pallet of transuranic waste drums that did not have any required banding to stabilize and restrain drums stacked on the third tier of a waste array. A key element of a TSR-level safety management program requires each four-drum pallet to be stabilized with two circumferential metal bands. Steps to install and verify drum banding are formalized in multiple Area G procedures.

These two events are the latest in a series of recent TSR violations and other problematic occurrences involving transuranic waste operations. LANL management has recognized this negative trending and is taking action to reinforce the importance of procedural compliance and attention to detail, as well as, initiating efforts to identify and address other common root causes shared by the recent events. Ensuring effective corrective action seems imperative given that the recent string of events is concurrent with a significant ramp-up in the transuranic waste operational tempo driven by aggressive inventory reduction milestones associated with LANL's Consent Order agreement with the state of New Mexico. LANL has recently begun making five waste shipments to WIPP in a typical week, up from 3 shipments in a typical week last year. Establishing and maintaining disciplined operations, including deliberate compliance with effective procedures will be critical to ensuring safety as the pace continues to increase and then must be sustained for years to come (site rep weekly 8/21/09).

Plutonium Facility: As part of the Documented Safety Analysis approved in December 2008, LANL committed to a series of engineered and administrative control upgrades to improve the safety posture of the facility. A near-term cornerstone of site plans to reduce the consequences of challenging accident scenarios, such as a post-seismic fire, is to seismically upgrade glovebox stands, as part of the line item TA-55 Reinvestment Project. The site office SER included a Condition of Approval to accelerate seismic upgrades for select, high-priority gloveboxes to be completed by the end of FY11. However, during this week's Integrated Nuclear Planning workshop, it was reported that these priority upgrades would be delayed rather than accelerated due to line item funding issues. With regard to implementing a safety class confinement ventilation system, a recent site office position paper concluded that a decision on pursuing PC-3 seismic upgrades to the system would not be made until mid-FY11. The site office asserted that completion of several key activities is required prior to making this decision, including: 1) completion of ventilation and ventilation support system backfit analyses 2) evaluation of systems and components against the updated Probabilistic Safety Hazard Analysis via the SAFER project and 3) comparison of system capacity versus seismic demand.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 28, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 28, 2009

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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 4, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 4, 2009

Radioactive Liquid Waste Treatment Facility: Radioactive Liquid Waste Treatment Facility personnel began a management self assessment (MSA), this week, to support resumption of transuranic liquid waste processing activities in Room 60/60A. After several years of work to replace or refurbish Room 60/60A piping and equipment; implement conduct of operations, maintenance, and engineering; and retrain operators, MSA commencement is a key step in reestablishing this critically important waste processing capability. The MSA will be followed by a laboratory readiness assessment prior to restart.

Transuranic liquid waste processing operations were last conducted in 2006. Inability to process this waste has caused a number of Plutonium Facility operations that generate transuranic liquid waste streams to be curtailed. Affected Plutonium Facility activities include the effort to chemically stabilize and recycle legacy plutonium-bearing residues to improve worker safety and to increase the availability of highly constrained vault storage space (site rep weeklies 4/10/09, 11/7/08).

Plutonium Facility: This week, a Technical Safety Requirement (TSR) violation was declared when an NNSA facility representative discovered a loose round sheet in the facility basement that indicated required TSR-level surveillances of HEPA filter differential pressures had not been completed. Plutonium Facility operations center personnel were aware of the missing record for these rounds, but incorrectly believed that their existing review and verification process would have contemporaneously identified and corrected any required rounds that had not been completed. Corrective actions have been identified to strengthen control, accountability, and review of multi-page round sheets.

Transuranic Waste Operations: In early-August, an NNSA site office safety system oversight review of the RANT shipping facility fire suppression system (FSS) identified National Fire Protection Association standard 72 (NFPA 72) code compliance issues that led to a positive Unreviewed Safety Question and associated Justification for Continued Operation (JCO). During transmittal of the assessment results, the site office requested LANL to provide a path forward and schedule to 1) address all findings, 2) increase confidence in the FSS 3) evaluate compliance with TSRs and 4) review extent of condition for issues identified. The LANL response this week noted that a prompt operability determination was completed that concluded the FSS is operable with the compensatory controls identified in the JCO (no additional TSR compliance issues were identified). To improve near-term confidence in the system, LANL is developing a design change to actuate the pre-action valve upon sprinkler head activation (this valve is currently actuated by heat and smoke detectors that are not located in compliance with NFPA 72). To address the extent of condition issues, LANL is evaluating maintenance practices for Environmental and Waste Management Operations, in particular, how deficient conditions identified during maintenance activities are documented and tracked. LANL is also developing a formal return to service process for safety related equipment and will require shift operations manager and system engineer review of completed work packages.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 11, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 11, 2009

Weapons Engineering Tritium Facility (WETF): Physical modifications and other prerequisite activities continue in anticipation of resuming hot operations at WETF. During a recent work package closeout review for a maintenance activity to replace a valve, facility personnel discovered that a required approval signature was missing from work control documentation. In the course of critiquing this work control issue, a significant conduct of operations concern was identified. During the performance of the maintenance evolution, personnel recognized that executing the work instruction as written would have the unwanted effect of rendering the credited tritium waste treatment system inoperable. To avoid impacting the tritium waste treatment system, personnel made a series of field changes to the work instruction that altered valve alignments and changed which components would be locked and tagged out of service to provide hazardous energy control. These field changes to the work instruction did not receive required reviews prior to being executed.

A number of LANL nuclear facilities, including WETF, have recently declared 'core' implementation of conduct of operations. This declaration is meant to correspond to being demonstrably compliant with the basic requirements of DOE Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*. Despite the significant efforts to achieve basic compliance with the conduct of operations manual, this event underscores the challenges that remain in effectively implementing the critically important expectation to pause work if a procedure cannot be performed as written, or if unexpected conditions are encountered.

Radioactive Liquid Waste Treatment Facility Replacement (RLWTF-R) Project: This week, the site office approved the Preliminary Documented Safety Analysis based on the project 60% design without conditions of approval. The safety basis review team concluded that the maturity and technical content of the safety basis associated with the 60% design package were sufficient to support Critical Decision-2 (CD-2), Approval of Performance Baseline. A Technical Independent Project Review is currently scheduled for October with CD-2 approval targeted for May 2010.

Transuranic Waste Operations: Based on the previously anticipated plans for use of the RANT shipping facility, LANL intended to submit an updated Basis for Interim Operation (BIO) in accordance with DOE-STD-3011 for limited life facilities in March 2010. Recent planning discussions for maintaining an enduring transuranic waste capability at LANL have included the potential for extended use of RANT; however, a final decision has not been made. This week, LANL recommended continuing on the current path for a BIO submittal in March regardless of this decision. LANL would then submit a DOE-STD-3009 compliant Documented Safety Analysis at the next annual update should a decision be made to utilize RANT as part of the enduring waste mission.

Fire Protection: The laboratory has made impressive progress on a program of training courses and facility tours designed to improve the knowledge and familiarity of Los Alamos County Fire Department personnel with LANL facilities, their unique hazards, and the fire fighting techniques and tactics most effective in a nuclear environment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 18, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 18, 2009

This week the staff held a teleconference with NNSA Headquarters, NNSA site office and LANL personnel concerning the restart plans, safety basis and readiness evaluation for the Weapons Engineering Tritium Facility.

Chemistry and Metallurgy Research (CMR) Building: On Monday, a CMR worker self-identified skin and personal clothing contamination in a non-radiologically controlled office area after handling a legacy material item with no radiological markings. Radiological Control Technicians responded and identified approximately 40,000 dpm alpha on his hand and clothing. In addition, floor surveys indicated contamination in the uncontrolled area. Subsequent worker nasal smears were positive. CMR personnel took appropriate actions to decontaminate the worker and cordon off and control the office area that was contaminated. This worker and another worker that had potentially come into contact with the item were placed on a special bioassay program.

During a chemical inventory walk down, this legacy item was identified in a cardboard box that was labeled precious metal and stored in cold laboratory. To properly secure the precious metal that was not believed to be contaminated, the item was transferred to the appropriate custodian (i.e., the worker that was contaminated). During inspection of the item by this custodian, degradation of the plastic around the item was noted which caused suspicion about the potential for contamination. The custodian appropriately paused his inspection and proceeded to the nearest contamination monitor and self-identified the contamination. CMR management initiated an extent of condition review to walk down other cold laboratory and office areas to identify potentially contaminated legacy items.

Plutonium Facility: This week, Plutonium Facility management declared a TSR violation when an unvented transuranic waste drum was discovered by an NNSA facility representative in the Plutonium Facility basement. This is the third discovery of an unvented container in the facility basement over the past seven months that has resulted in either a TSR violation or declaration of a potential inadequacy of the safety analysis. All three situations were identified by NNSA facility representatives.

In this case, the legacy unvented drum had been re-categorized from low level waste to transuranic waste in January based on new assay data, but the drum had not been labeled or re-barcode to indicate this change. In response to this event, facility procedures and processes are being revised to ensure safety basis and compliance implications are evaluated when the status of a waste container changes from low level to transuranic. Also, facility management has directed the conduct of a thorough and rigorously documented extent of condition review that will assess all containers in all applicable areas of the Plutonium Facility. This review is intended to differ in scope and formality from ineffective previously conducted extent of condition reviews that focused only on drums that were known to be, or were readily identifiable as, transuranic waste containers (site rep weeklies 6/26/09, 3/6/09).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 25, 2009

MEMORANDUM FOR: Timothy Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis, DNFSB Site Representatives
SUBJECT: Los Alamos Activity Report for Week Ending September 25, 2009

The site representatives were at DNFSB Headquarters in Washington, DC. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 2, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 2, 2009

Plutonium Facility: On Wednesday, facility management declared the fire suppression system inoperable based on recent hydraulic calculations that conclude the system does not achieve the water density coverage required in the safety basis (0.19 gpm/ft^2). Facility activities were placed in a safe and stable condition to support a transition to standby mode, which was accomplished Wednesday afternoon, consistent with the Technical Safety Requirements (TSRs). To support upgrading the classification of the fire suppression system from safety significant to safety class, LANL performed a system adequacy analysis (backfit analysis) in 2008. This analysis noted that limited portions of the fire suppression system may not achieve the density coverage required by NFPA 13 for Ordinary Hazard Group II (the group designation for the Plutonium Facility) and recommended that an evaluation be performed. The hydraulic calculation recently completed for the system identifies that 13 of approximately 100 hydraulic areas do not meet the density requirement. LANL has identified this deficiency as a Potential Inadequacy in the Safety Analysis and plans to pursue safety basis changes including compensatory measures (e.g. additional combustible control/fire watches in affected areas) until the system can be upgraded.

Also this week, personnel found a surface-contaminated legacy item in an unposted area outside of the Plutonium Facility proper (i.e. PF-4) during an extent of condition walkdown performed in response to a recent contamination event and worker uptake at CMR (site rep weekly 9/18/09). Plutonium Facility management established a systematic and thorough inspection plan for uncontrolled auxiliary areas that could contain contaminated legacy items that are not appropriately marked or labeled. This inspection process included opening locked drawers that have not been accessed for many years. In one locked drawer, personnel found legacy radiation sources in an unmarked container. One of these radiation sources was found to have removable americium contamination. Upon discovery of the contamination, appropriate actions were taken to exit the room, post the area and develop a recovery plan with support from radiation protection personnel. The management decision to undertake a broad extent of condition review to identify problematic legacy items in unexpected locations led to the isolation and elimination of this previously unknown and uncontrolled hazard.

Weapons Engineering Tritium Facility (WETF): Last month, as a part of the ongoing extent of condition reviews for pressure safety issues at WETF, LANL declared a TSR violation for the Containerization Program because many containment vessels do not meet the TSRs (drop test, temperature rating, leak rate testing and maximum allowable working pressure). This week, LANL submitted safety basis changes to address this issue. The submittal recommends the following compensatory measures for legacy containers that do not meet the TSRs: labels to indicate specific vulnerabilities; storage in a restricted access area; and storage of containers that do not meet drop test requirements within 1 foot of the floor. WETF continues implementation of previous safety basis changes and other readiness activities in preparation for facility restart.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 9, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 9, 2009

Plutonium Facility – Fire Suppression System: As discussed last week, the Plutonium Facility remains in standby mode pending resolution of operability issues associated with the fire suppression system. This week, LANL submitted a Justification for Continued Operations (JCO) to the NNSA site office that would allow a return to normal operations for most of the facility with specific compensatory measures for the affected areas (i.e. the areas that do not meet the safety basis requirement for flow density). Most of the affected facility areas (11 of 13) meet the NFPA 13 flow density requirement for Ordinary Hazard Group 1 (OH1) of 0.15 gal/ft² but not the safety basis requirement of 0.19 gal/ft². One area is only slightly below the OH1 flow density requirement and another area is significantly below this density requirement. LANL notes that NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*, requires an OH1 fire suppression system for Class C laboratory units and that the recently updated Fire Hazards Analysis identified the facility as containing Class C chemistry laboratory units.

To allow normal operations to resume, the JCO recommends the following compensatory measures: 1) for the 11 areas that meet the OH1 flow density and the one area slightly below this density, these areas will be inspected prior to resuming operations and daily to ensure combustibles and flammable chemicals meet the requirements for OH1 Class C laboratory units and 2) for the one area with significant deficiencies, operations will remain suspended. As part of the Documented Safety Analysis (DSA) implementation, an improved combustible control program was in the process of being rolled out. This program and associated procedures will now be used to implement the first compensatory measure including an Implementation Validation Review prior to mode change. LANL is also pursuing design changes to improve system performance such that the safety basis flow density requirement will be met. The site office is currently reviewing the JCO.

Plutonium Facility – Legacy Material Disposition: LANL recently completed a study of nuclear materials stored at the Plutonium Facility to identify a path forward for eliminating nuclear material congestion and legacy container issues. The study concluded that a significant portion of the nuclear materials (approximately 1/3 of the containers) should be dispositioned off-site and that significant improvements in floor and vault storage could be achieved through disposition, processing and consolidation of materials. The study also notes that approximately 40% of the roughly 10,000 existing material containers need to be either dispositioned or replaced with more robust containers that meet the nuclear material packaging manual. For this fiscal year, the NNSA site office identified performance based incentives that are focused on removal of legacy nuclear materials and repackaging of nuclear materials into robust containers.

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL recently submitted a revised DSA and associated TSR document for NNSA site office review and approval. Unlike the existing 1990s-vintage authorization basis that relies solely on administrative controls, the new submittal credits a number of transuranic liquid waste tanks to provide confinement. Also, a Specific Administrative Control limiting material inventory is identified to protect the facility's Hazard Category 3 status.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 16, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 16, 2009

Staff member B. Rosen was onsite to attend a working group meeting on Nuclear Material Packaging.

Plutonium Facility: On Tuesday, a general evacuation alarm caused by a Criticality Alarm System (CAS) signal, a loss of all facility ventilation and failure of the Facility Control System (FCS) occurred at the Plutonium Facility. The CAS alarm was subsequently identified to be erroneous and troubleshooting efforts were able to restore ventilation and FCS after approximately 3 hours. The facility was in standby mode during this event due to previously identified issues with the fire suppression system and, therefore, limited personnel were in the facility. During the event, personnel responded appropriately to alarms/announcements and evacuated the facility. Subsequent activities this week have focused on investigation into the cause of the event and reentry and evaluation of the facility condition. One laboratory room was identified to have some spread of contamination based on a continuous air monitor alarm.

All of the systems that alarmed or failed (i.e., CAS, FCS and ventilation) have an interface with the facility Uninterruptible Power Supply (UPS). Just prior to the event, control room operators heard a noise that appears to have been caused by a failure of a power supply that is also supplied by the UPS. While investigation continues including discussions with the UPS vendor, initial indications are that a transient on the UPS bus likely caused the event.

Nuclear Material Packaging: The Nuclear Packaging Manual (DOE M 441.1-1) working group met to review the container design, test plans and overall status of the Standard Nuclear Material Container (SNMC) being developed at LANL. The SNMC is a new generation packaging system designed and tested to meet the more stringent requirements of the manual. Other NNSA sites that handle and store plutonium appear likely to adopt and use the LANL SNMC package rather than designing and qualifying their own manual-compliant containers.

Safety enhancements over the current generation package (i.e. the Hagan container) include a more corrosion and drop resistant stainless steel body, improvements to the filter and o-ring seal material and design, and an improved positive lid closure mechanism. The principal challenges to meeting containment requirements of the manual include thermal and radiation resistance of the o-ring seal and filter, corrosion resistance of the container, impact resistance of the package, and a surveillance program to validate the design criteria and package life.

Several sizes of prototype SNMCs have been tested and passed the post-drop release rate requirements of the manual. The Los Alamos Site Office has requested that the NNSA Packaging and Certification Division assist LANL in developing technically defensible nuclear material packaging and storage safety documents for review and approval by site office management. This additional independent review should provide greater confidence in the technical basis for the SNMC design, surveillance program, and safety documentation process.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 23, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 23, 2009

Transuranic Waste Operations: This week, Area G personnel discovered two unvented containers dispositioned as low level waste that should have been characterized as transuranic waste. One container was retrieved from a disposal pit and secured in a vented overpack and planning continues to retrieve the other affected container from a disposal shaft. Both affected drums originated at TA-18 and both contain actinide sources contained within lead shielding pigs. During the characterization process at TA-18 the weight of the shielding material was inappropriately applied to the calculation that determines whether an item is low level or transuranic waste. In response to this discovery, Area G management has suspended all source shipments to Area G until weaknesses in the characterization process can be addressed. An extent of condition review is also being conducted to determine if other sources previously disposed of as low level waste were affected by similar characterization errors.

Chemistry and Metallurgy Research (CMR) Building: LANL declared a Potential Inadequacy in the Safety Analysis this week associated with HEPA filters at CMR. During a LASO safety system oversight review of HEPA filters across the site, LANL could not verify performance of three tests at CMR (related to air distribution and mixing in the filter plenums) in accordance with ASTM F1471, *Standard Test Method for Air Cleaning Performance of a High Efficiency Particulate Air-Filter System*. This standard is specifically called out in the CMR Technical Safety Requirements. As a compensatory measure, CMR personnel are verifying fire suppression riser pressure daily (the accident scenarios that credit the HEPA filtration are certain wing fire scenarios).

Plutonium Facility: On Friday, facility personnel completed the corrective actions and operability determinations associated with Uninterruptible Power Supply (UPS) transient that occurred last week and returned the facility to operations mode (with the exception of one area that is impacted by the fire suppression issue discussed below). The LANL investigation into this event to date indicates that a power supply failure (associated with a data server) caused a power transient on the UPS bus sufficient to result in the event (i.e. facility control system loss of communication, criticality alarm system activation and ventilation shutdown). As a part of the corrective actions, LANL is evaluating additional diagnostics and other actions to improve the existing UPS. For the longer term, a seismically qualified safety class UPS will be installed in the facility as a part of ventilation system improvements included in the TA-55 Reinvestment Project Phase 2. Facility management also plans to pursue a procedure to manually start and maintain zone 1 (i.e., glovebox) ventilation for situations when the facility control system is not operable.

Programmatic activities at the Plutonium Facility remain suspended pending implementation of Justification for Continued Operations controls associated with flow density issues for the fire suppression system. This week, LANL began Implementation Verification Reviews, which will be done for each individual laboratory room, to review implementation of the improved combustible loading program. LANL expects to complete reviews (and corrective actions, if any) to support resumption of programmatic operations for some laboratory rooms next week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 30, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 30, 2009

Plutonium Facility: Programmatic operations in the Plutonium Facility remain suspended as a result of the recent discovery that portions of the facility's fire suppression system cannot deliver the minimum required flow density of fire water. A Justification for Continued Operations (JCO) has been approved by the NNSA site office that would allow programmatic operations to resume in most areas after compensatory measures to reduce combustible loading have been implemented. The facility is in the process of standing up a new transient combustible loading control program that satisfies both the JCO requirements and a key part of an NNSA condition of approval associated with the 2008 Plutonium Facility documented safety analysis requiring implementation of more robust combustible loading controls (site rep weeklies 10/9/09, 10/2/09).

The new program establishes transient combustible permits for each laboratory room and basement area that specify allowed quantities of various types of combustibles. Areas will be inspected daily to ensure compliance with permit limits. Initially, the transient combustible limits reflected on the permits are based on NFPA code requirements, but facility management intends to gradually tighten permit restrictions with the goal of allowing only the minimum required combustibles needed to support specific operations. The new transient combustible control program goes into effect next week and upon verification of successful implementation of the program and the JCO controls, the facility will pursue resumption of programmatic operations in high-priority laboratory rooms.

Formality of Operations: Achieving 'core' implementation of conduct of operations, maintenance and engineering under the Formality of Operations initiative was a major area of emphasis for LANL and NNSA in FY09. Core implementation generally represents reaching a state of minimum compliance with DOE requirements. By the end of FY09, LANL had declared core implementation of all elements of Formality of Operations except for conduct of maintenance and engineering at WETF and conduct of engineering at the Plutonium Facility, which are scheduled to complete in FY10 and FY11, respectively. This week, the site office concurred with LANL's declarations of implementation with three exceptions (conduct of operations at the Plutonium Facility, conduct of maintenance at the WCRR repackaging facility, and conduct of maintenance at the RANT shipping facility). NNSA directed action to be taken to improve the three areas of non-concurrence. NNSA also noted that without continuous attention, the gains made in these critical areas will be lost. Implementing conduct of training, the final element of Formality of Operations, will be a focus area for FY10 and has been contractually incentivized by NNSA.

Waste Management Risk Mitigation (WMRM) Project: Physical work to create a connection between the WMRM tank farm and the low level waste collection system completed this week. This a major step toward establishing a capability to provide 250,000 gallons of low level liquid waste storage space for use in an emergency. Also, NNSA-Headquarters (NA-10) has concurred with the LANL and LASO recommended path forward to use 100,000 gallons of WMRM tank space to provide continuous-use low level waste influent storage for the Radioactive Liquid Waste Treatment Facility Upgrade project that is currently in design.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 6, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 6, 2009

Staff members C. March, M. Moury, J. Pasko, J. Plaue and R. Tontodonato were onsite this week to discuss Recommendation 2009-2, *LANL Plutonium Facility Seismic Safety*, with NNSA Headquarters, site office and LANL personnel.

Radioactive Liquid Waste Treatment Facility: This week, LANL completed the Laboratory Readiness Assessment (LRA) associated with the restart of transuranic liquid waste processing activities in Room 60/60A. A total of 6 pre-start findings (3 closed during the review), 17 post-start findings (one closed during the review) and 4 noteworthy practices were identified by the LRA team. Pre-start findings that remain open include fire protection issues in an adjacent room (e.g. obstructed sprinkler head), fire department access road and water connection issues, and Potential Inadequacy of the Safety Analysis compensatory measures that are not included in the facility Safety Basis Document List. As a noteworthy practice, the team observed that the reader/worker method of procedural compliance and system status board updates both worked extremely well. Restart of transuranic liquid processing in Room 60/60A will allow resumption of aqueous processing activities in the Plutonium Facility that had been curtailed due to the inability to process radioactive liquid waste effluents.

Plutonium Facility – Ventilation: A backfit analysis on the Plutonium Facility Active Confinement Ventilation System was recently completed to evaluate gaps and recommend actions to upgrade the system from safety significant to safety class. The analysis concluded that with appropriate upgrades and improvements the system can perform a safety class function. Recommendations identified during the analysis to improve the system include 1) installation of a new safety class control system, 2) replacement of the uninterruptible power supply (this is part of the TA-55 Reinvestment Project, Phase II), 3) installation of electro-hydraulic actuators for dampers, 4) provide functional backup for basement exhaust and 5) complete ventilation modeling. LANL plans to complete backfit analyses for support systems (electrical and instrument air) this fiscal year.

This week, LANL personnel noted that seismic evaluations of ventilation, fire suppression and support systems against the updated Probabilistic Seismic Hazards Analysis will be completed using the methodology established during the SAFER Project. These evaluations along with the ventilation system modeling and analysis will provide key information to inform decisions related to the selection and upgrade of safety class systems for challenging seismic accident scenarios.

Plutonium Facility – Safety Basis Strategy: This week, the NNSA site office approved a revised Safety Basis Strategy for the annual update to the Plutonium Facility Documented Safety Analysis scheduled to be submitted in early December. The revised strategy document discusses an approach for refining analysis of the seismically-induced fire accident scenario by disaggregating the material at risk into the various physical forms (e.g. metal, oxide, solutions, etc) actually found in the facility and assigning analytical values that correspond to the dispersibility of these different material forms. The current DSA assumes that all material at risk on the laboratory floor that could be involved in a seismically-induced fire has the extremely high dispersibility of molten plutonium metal.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 13, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 13, 2009

Low Level Waste Operations: While performing sorting and segregation operations for mixed and low level waste on Monday, a continuous air monitor (CAM) alarmed indicating airborne contamination. Workers responded appropriately and exited the area. Subsequent surveys found that one worker had contamination on his lab coat and positive nasal smears. Surveys of the area and analysis of the CAM filter paper indicated uranium contamination levels in the range of 250 to 1000 dpm per 100 cm².

This year, LANL began a campaign to disposition approximately 20 legacy metal crates that contain mixed and low level waste. The Integrated Work Document (IWD) and Radiological Work Permit (RWP) used for the legacy campaign had been developed for activities involving a different waste stream. Respiratory protection was required for the initial opening of waste crates; however, if initial surveys indicate no contamination, respirator protection was not required for subsequent sorting and segregation activities. For the legacy campaign, the IWD and RWP were not re-evaluated to ensure work controls were appropriate for the hazards associated with this new activity. Corrective actions identified by LANL management include re-evaluation of the process and work controls specific to the legacy waste campaign and evaluation of triggers that would drive changes in work scope to receive an appropriate level of review to ensure hazards are adequately captured and controlled.

Radioactive Liquid Waste Treatment Facility (RLWTF): This week, RLWTF experienced another failure of the low level waste tubular ultrafilter unit when a plastic connection assembly failed, releasing contaminated water to the room. This is the third event in the last 13 months caused by the same failure mode. A plastic curtain, installed after the last failure in June, mitigated water spray and prevented equipment damage. However, three workers were in the vicinity when the failure occurred. Exit surveys of the workers found no personnel contamination and nasal swipes were negative. Recovery efforts to decontaminate the room, inspect the tubular ultrafilter unit and isolate affected portions of the system completed this week (site rep weekly 6/12/09).

Also, work continues to address pre-start findings from the recently completed Laboratory Readiness Assessment for transuranic waste processing operations in RLWTF's Room 60/60A. One pre-start finding requires physical modifications to change the sprinkler head configuration for a section of the facility's fire suppression system. This work may complete in time to support resumption of transuranic liquid processing this calendar year (site rep weekly 11/6/09).

Transuranic Waste Operations: This week, the NNSA site office provided comments to LANL on draft hazard and accident analyses reviewed to support the upcoming submittal of a rule-compliant Area G Basis for Interim Operations. As part of their 64 total comments, the site office noted that safety management programs had been selected over engineered controls or specific administrative controls (SAC) for some accident scenarios without adequate justification. Also, some SACs were found to lack specificity in control limits or did not have well defined technical bases to support explicitly identified limits.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 20, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 20, 2009

Weapons Engineering Tritium Facility (WETF): This week, LANL began an Implementation Verification Review (IVR) for multiple Technical Safety Requirement (TSR) page changes at WETF. The changes include revisions to the containerization and pressure safety programs to address legacy containers that may exceed their maximum allowable working pressure and to modify requirements for pressurized tritium systems. The changes were also required to resolve inconsistencies between the safety analysis and the TSRs. The IVR is expected to conclude early next week. A laboratory readiness assessment is planned in December to support resumption of tritium gas handling activities.

Technical Area (TA)-21: During activities to support American Recovery and Reinvestment Act demolition work at the legacy TA-21 site, three unvented transuranic waste drums were discovered in a decommissioned radiological facility. The drums, which contain a total inventory of less than 0.25 plutonium equivalent-Ci, show no signs of internal pressurization. However, to mitigate the risk of hydrogen deflagration, this week laboratory personnel applied lid restraints to the three unvented drums and restricted operations that can be performed in the vicinity of the staged drums. LANL personnel are preparing a transportation plan for NNSA review and approval to place the three unvented drums in vented over-packs and move them from TA-21 to Area G where they will be placed in a controlled, segregated storage array to await ultimate venting and disposition.

High Explosive Operations: This week, LANL senior management paused all high explosive operations at the laboratory in response to the latest in a series of events where personnel deliberately bypassed safety barriers or disregarded safety postings. During the operational pause, compensatory measures were developed to improve access control and communications at high explosive firing sites. Also, personnel received a refresher briefing focused on safety requirements and management expectations for strict compliance with these requirements. Prior to resuming work, operations at high explosive firing sites had to be reviewed and approved by programmatic line management and released by the Facility Operations Director's organization.

Sitewide Seismic Hazards: The site office previously approved an extension for the Justification for Continued Operation (JCO) associated with the updated probabilistic seismic hazards assessment for six nuclear facilities to November 23, 2009 and to June 30, 2010 for the Plutonium Facility. This week, LANL requested another extension for the six nuclear facilities (i.e. WETF, CMR, RLWTF, WCRR, RANT and interim radiography operations at PF-4) to March 2010. LANL notes that the independent peer review of safety basis calculations is taking longer than expected. The schedule for seismic evaluation and resolution of the JCO for the Plutonium Facility remains unchanged.

Plutonium Facility: A laboratory readiness assessment began this week to support the start-up of surveillance activities related to DOE-STD-3013, *Stabilization, Packaging, and Storage of Plutonium Bearing Materials*. These new activities involve drilling into the outer and inner welded containers of a 3013 packaging configuration to obtain headspace gas samples for analysis and evaluation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 27, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 27, 2009

The laboratory was closed on Thursday and Friday in observance of the Thanksgiving holiday.

Plutonium Facility – Material Relocation: Plutonium Facility personnel have identified a number of large uranium items currently stored in the vault that could exchange places with large plutonium items currently staged on the laboratory floor. This type of material swap would place the more hazardous Pu items in a more robust storage location and lower the aggregate amount of actual material-at-risk that could be involved in severe postulated accident scenarios such as seismically-induced fires. With programmatic operations largely resumed in the Plutonium Facility, the timing and execution of these types of material swaps appear to be limited primarily by priority and funding.

Plutonium Facility – Isotopic Fuels Impact Test (IFIT) Readiness: This week, the NNSA site office approved a plan of action for a laboratory readiness assessment (LRA) related to the restart of IFIT activities in the Plutonium Facility. The IFIT assembly is a seven inch inert gas launcher used to perform high velocity and high temperature impact tests on robust Pu-238 heat sources designed for space applications. These operations were last conducted in 2001. An NNSA readiness assessment will also be conducted prior to restarting IFIT activities involving Pu-238 heat sources.

Weapons Engineering Tritium Facility (WETF): This week, LANL completed an Implementation Verification Review (IVR) of Technical Safety Requirement (TSR) page changes at WETF. The IVR team concluded that, except for the identified pre-implementation findings, WETF personnel adequately demonstrated appropriate implementation of the TSR page changes. The following six pre-implementation findings were identified:

- Inadequate tritium containment vessel cognizant system engineer level of knowledge
- Use of process information with unknown uncertainty for compliance with a TSR
- Safety basis document list did not contain all required documents
- Lack of a pressure safety program documentation package for tritium containment vessels
- A radioactive material inventory per the TSRs was not demonstrated
- A job task analysis was not performed to ensure appropriate personnel are adequately trained on the TSR page changes

The IVR team also identified four post-implementation findings and 17 observations. The function of the Work Scope Review Team that will be used to evaluate potential tritium activities to ensure compliance with the safety basis and pressure safety program requirements was identified as a positive.

WETF personnel have also begun performing sensitive leak testing on pressurized tritium systems. This is one of the final steps in verifying that these credited systems comply with pressure safety program requirements and in confirming their operability. A leak detected in a vacuum pump fitting has been repaired and a retest of this portion of the system is being performed.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 4, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 4, 2009

Plutonium Facility – Documented Safety Analysis (DSA): This week, LANL submitted the annual update of the DSA and the Technical Safety Requirements to the site office for review and approval. Notably, this update includes revised analysis of the post-seismic accident scenarios (both with and without fire). As discussed in the safety basis strategy, LANL disaggregated the material-at-risk into the various physical forms (e.g. metal, oxide, solutions) present in the facility and assigned the specific analytical values for dispersibility for each of these material forms. In addition, LANL proposes a specific administrative control for material-at-risk for each of these forms to protect the assumptions made in the DSA. Based on the revised analysis, the dose consequence for the postulated post-seismic fire accident scenario is reduced by more than an order of magnitude versus the DSA approved in December 2008. However, mitigated consequences (the only credited control for this scenario is the building structure with an associated leak path factor) remain above the DOE evaluation guideline.

The DSA was also updated to use the most recent weather data for dispersion modeling which resulted in an increase of approximately 30% for all offsite dose calculations. In addition, LANL addressed several conditions of approval that were identified by the site office Safety Evaluation Report including the following: incorporation of the results of the backfit analysis and industry code evaluation for the safety class fire suppression system; identification of criticality safety controls for inclusion in the DSA (vault racks and shelving criticality safety functions were included in this update); improved safety system, structure and component descriptions in chapter 4; clarification and improved basis for Technical Safety Requirements; and improved process descriptions in chapter 2.

Radioactive Liquid Waste Treatment Facility Replacement (RLWTF-R) Project: This week, NNSA Headquarters began their Technical-Independent Project Review (T-IPR) of the RLWTF-R Project to determine whether the current status of design, scope, cost, schedule, safeguards and security and safety aspects meet mission objectives and project performance requirements. Specifically, the T-IPR team has been asked to focus on the overall design (e.g. material selection, confinement strategy, nuclear safety strategy, seismic design), the system engineering approach used to manage the design requirements, adequacy of the design solution against technical requirements, the quality assurance program and implementation and actions to resolve DNFSB issues. LANL is currently at the 60% design point for this project and plans to pursue Critical Decision-2, Approval of Performance Baseline, in May 2010.

Weapons Engineering Tritium Facility (WETF): This week, LANL continued to resolve pre-implementation findings identified during the safety basis Implementation Verification Review and complete other readiness activities to support a return to operations mode in the near term. This mode change will allow WETF personnel to begin overpacking (in credited secondary containers or gloveboxes) approximately 70 containers that may exceed their maximum allowable working pressure and do not currently have secondary confinement. Consistent with site office direction, LANL will complete a Laboratory Readiness Assessment (LRA) prior to tritium gas handling operations. The LRA is now scheduled for January 2010.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 11, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 11, 2009

Staff member M. Moury and outside expert B. Matthews were onsite this week to meet with site office and LANL personnel to discuss near term actions in response to Recommendation 2009-2.

Plutonium Facility: This week, the NNSA site office transmitted to NNSA Headquarters (NA-10) a document describing the seismic safety posture of the Plutonium Facility. The site office document discusses the following: • planned and completed near-term actions intended to reduce the probability and consequence of a seismically-induced fire scenario, • differences in assumptions and accident consequence results between the December 2008 DSA and the recently submitted 2009 annual DSA update, • accident consequence sensitivity to changes in various analytical assumptions and parameters, and • the attendant tradeoffs and rationale for not performing certain near-term actions.

Radioactive Liquid Waste Treatment Facility Replacement (RLWTF-R) Project: This week, NNSA Headquarters completed the field work for the Technical-Independent Project Review (T-IPR) of the RLWTF-R Project. The final report is expected to be complete in January. During an outbrief with site office and LANL personnel, the team reported that 36 criteria areas out of approximately 200 were graded as red, which require resolution prior to critical decision-2 (CD-2). However, the T-IPR team also noted that many of these issues had clear paths to closure prior to CD-2. Several key unresolved issues were identified including compliance with central technical authority guidance on chemical hazards, LANL configuration management of project documents, and resolution of 60% design review comments that may impact cost and scope baselines (LANL disputes this issue).

Radioactive Liquid Waste Treatment Facility: LANL requested and the site office approved an evaluation of the safety of the situation (ESS) for a 2005 Potential Inadequacy of the Safety Analysis (PISA) that was identified due to degraded transuranic liquid waste processing equipment. Since the PISA was identified in 2005, LANL has repaired or replaced the degraded equipment to support resumption of transuranic liquid waste processing operations, which have been shutdown since 2006. The ESS eliminates a number of compensatory measures that had been identified in response to the PISA. LANL has also completed closure of pre-start findings identified during the laboratory readiness assessment and will resume transuranic liquid waste processing following site office verification of closure packages, which will occur as early as next week.

Transuranic Waste Operations: The RANT shipping facility has begun an outage that will include physical modifications to address operability issues associated with the facility's safety significant fire suppression system (FSS). The RANT FSS is a dry pipe system that requires pre-actuation which had been triggered by heat or smoke detectors. In August, an NNSA site office safety system oversight assessment identified National Fire Protection Association (NFPA) code non-compliances associated with the heat and smoke detector configuration that rendered the system inoperable. TSR-level compensatory measures requiring fire watches at RANT can be lifted upon successful completion of physical modifications and testing, as well as, approval and implementation of a safety basis page change that reflects the new pre-action arrangement (site rep weekly 9/4/09).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 18, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 18, 2009

Davis was offsite this week. Also, the Board's staff held a video teleconference with LANL and NNSA site office personnel to discuss ongoing Plutonium Facility seismic analyses.

Radioactive Liquid Waste Treatment Facility (RLWTF): The NNSA site office has authorized LANL to resume transuranic liquid waste treatment operations in RLWTF's Room 60 and 60A. Reconstituting this critical processing capability, which has been unavailable since 2006, is a significant milestone. RLWTF management intends to resume transuranic processing in a highly controlled fashion, in accordance with their approved Startup Plan. Limited operations to decant and sample liquid from a transuranic sludge thickening tank are scheduled to begin next week.

Technical Area (TA)-15: On Wednesday, a containment assembly catastrophically failed during an indoor propellant-driven experiment at TA-15 involving a large bore powder gun. No radioactive material was present in this experiment and no personnel were injured, however, the failure did cause significant structural damage to the building housing the powder gun. The cause of the failure is not yet well understood and LANL is planning an investigation. This is at least the second containment failure of this powder gun, which is ultimately intended to be fielded underground at the Nevada Test Site to perform dynamic experiments involving plutonium (site rep weekly 6/13/08).

Weapons Engineering Tritium Facility (WETF): This week, WETF management declared a TSR violation based on a programmatic breakdown of the Quality Assurance Program. This violation was prompted by the discovery that important instrumentation, such as pressure and temperature sensors needed to implement TSR-level controls, had not been calibrated for many years and are not controlled through a formal measurement and test equipment calibration program. This issue was identified during an implementation verification review of multiple TSR page changes that have been submitted and approved recently to address legacy issues that have been discovered as part of WETF management's deliberate and systematic resumption process (site rep weeklies 12/4/09, 11/27/09).

As additional legacy issues have been identified and dispositioned, the schedule to restart WETF programmatic gas transfer operations has continued to slip. This week, the NNSA site office formally notified LANL that due to the length of time (more than 14 months) since gas transfer operations have been performed, a dedicated federal readiness assessment will be required prior to resumption.

Chemistry and Metallurgy Research (CMR) Building: The current CMR interim TSRs credit Mosler safes as safety class design features that protect radiological material from being impacted by facility accident scenarios (i.e. Mosler safes are credited with a damage ratio of 0). Based on this credited safety function, material inside Mosler safes at CMR did not count toward the facility's material-at-risk (MAR) inventory limit. Recent analysis performed as part of the SAFER project has concluded that Mosler safes cannot be credited to survive seismically-induced mechanical insults resulting from falling debris. The facility has instituted a compensatory measure to begin counting inventory inside Mosler safes toward the facility's MAR limit. A TSR page change is pending.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 25, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director

FROM: B. P. Broderick and R.T. Davis

SUBJECT: Los Alamos Report for Week Ending December 25, 2009

The site representatives were offsite this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 1, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director

FROM: B. P. Broderick and R.T. Davis

SUBJECT: Los Alamos Report for Week Ending January 1, 2010

The laboratory was closed this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 8, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 8, 2010

Radioactive Liquid Waste Treatment Facility (RLWTF): This week, LANL resumed transuranic liquid waste operations in Room 60/60A at RLWTF. For legacy transuranic waste in the sludge thickening tank, operators decanted the supernate in preparation for sludge sampling to support drum tumbler operations. RLWTF personnel also performed simulated sampling of the transuranic liquid waste receipt tanks consistent with the startup plan. Actual sampling and transfer of acidic waste, which will free up receipt space and allow transuranic liquid waste transfers from the Plutonium Facility, are expected to commence next week.

Plutonium Facility – Seismic Safety: In December, the site office provided direction to LANL on actions to improve seismic safety at the Plutonium Facility including a request for a plan and schedule to complete the following improvements in FY-2010: 1) seismic electrical power shutoffs 2) installation and use of fire-rated nuclear material storage systems (e.g., robust safes) 3) conceptual designs for ventilation and fire suppression seismic upgrades 4) fire hazard analysis corrective actions (16 of 29 deficiencies) 5) evaluation of glovebox fire protection options 6) fire barrier assessment (including any required repairs for the main facility dividing wall, known as the H-Wall). The site office plans to identify contract incentives for completion of these activities.

Other important safety improvements at the Plutonium Facility (e.g., conceptual design for a safety class ventilation system for non-seismic accident scenarios, backfit analysis for electrical and instrument air systems, and implementation of a safety class fire suppression system for non-seismic fires) have also been incentivized for this fiscal year. For material reduction and repackaging, the site office requested that LANL provide separate goals to complete overpacking of non-safety class heat source plutonium containers (targeted for completion in June 2010) and other material-at-risk reduction activities.

Weapons Engineering Tritium Facility (WETF): In late December, WETF returned to Operations mode after a series of Technical Safety Requirement page changes were approved and verified to be implemented. The facility had been in Warm Standby mode since October 2008. This mode change allows facility personnel to handle vessels containing greater than ‘residual quantities’ of tritium. However, gas transfer and processing activities remain restricted pending successful completion of laboratory and federal readiness assessments. Return to Operations mode should remove an obstacle to overpacking roughly 70 tritium vessels in WETF that are known or suspected to exceed their maximum allowable working pressures and currently reside outside of credited containment (i.e. gloveboxes or secondary containment vessels).

Technical Area (TA)-15: LANL management has chartered a Type B-like investigation of the December 16th event at TA-15 where containment features catastrophically failed during the operation of a large bore powder gun. The failure caused extensive structural damage to the building housing the gun assembly.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 15, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 15, 2010

Technical Area-35 (TA-35): Recently, LANL completed an investigation of two events involving the eruption of nitric acid waste solutions at Materials Science and Technology Division TA-35 facilities (site rep weeklies 7/10/09 and 7/24/09). The first event involved a student discarding acetone waste into a gas-tight acid waste container that resulted in an over-pressurization breaching both primary and secondary containers. The second event occurred when a worker discarded a mixture of nitric acid and sodium hydroxide solution into a shipping container that resulted in a rapid reaction and expulsion of solution. The investigation team concluded that separate causal analysis was warranted for these events because the causes were sufficiently different.

For the first event, the team concluded that the root cause was a lack of hazards assessment as a part of work planning for the waste disposal activity. Contributing causes included a lack of student training and knowledge and inadequate communication between the student and mentor. Five specific Judgments of Need were identified for this event.

For the second event, the root cause was identified as inadequate Integrated Work Management implementation (work planning), including use of subject matter experts during work planning, and appropriate use of stop work authority. Contributing causes included waste management issues, weaknesses in worker knowledge, training and qualification and inadequate communications. Nine Judgments of Need were identified for this event. For both events, the team identified several management concerns related to Integrated Work Management development, implementation and institutional requirements and identified suggested improvements for emergency response.

Technical Area-48 (TA-48): Late last week, a post-doctoral researcher began a chemical synthesis activity in a TA-48 laboratory facility that required the operation of an unattended oven over the weekend. When personnel returned on Monday morning they discovered that an energetic chemical reaction had breached the reaction vessel, damaged the oven and released chemicals into the room. This event exhibits similarities with the TA-35 events discussed above, including inadequacies in the work planning and control associated with this activity.

Chemistry and Metallurgy Research Building: This week, LANL submitted a revised Documented Safety Analysis and Technical Safety Requirements to support post-2010 operations at CMR. This safety analysis updates the previous January 2009 submittal based on comments from the site office and includes updated identification of facility hazards. The analysis supports continued analytical chemistry and material characterization activities in Wings 5 and 7, confinement vessel disposition activities in Wing 9 and deactivation activities in the other CMR wings. The scenario with the highest mitigated offsite dose consequence and only mitigated consequence that exceeds the DOE evaluation guideline is for a seismic collapse and fire, with an offsite dose of approximately 36 rem (Wing 9 material-at-risk to support confinement vessel disposition contributes approximately 12 rem to this scenario). LANL plans to implement safety basis controls by the end of December 2010 (except confinement vessel disposition activity, which will be implemented prior to execution).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 22, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 22, 2010

Plutonium Facility – Seismic Safety: This week, LANL responded to the December site office direction on improving seismic safety at the Plutonium Facility (site rep weekly 1/8/10). LANL proposes completion of several improvements this fiscal year including the following: 1) complete 100% design of seismic electrical interlocks (August) 2) implementation of ignition source control (March) 3) installation of 6 robust safes (August) 4) testing of existing containers to establish a defensible damage ratio during a fire (September) 5) seismic evaluation of fire suppression and ventilation systems (September) and 6) fire-barrier assessment (July). LANL also identified material-at-risk reduction goals for the Plutonium Facility. For weapons grade plutonium, the laboratory plans to repackage into robust containers or ship off-site 200 kg (Pu-239 equivalent) of material. For heat source plutonium, LANL plans to overpack the roughly 100 remaining non-safety class Russian Product Containers by the end of June.

To accomplish these objectives, LANL proposes to modify or defer other activities that were planned for this fiscal year including a delay in fully implementing the 2008 safety basis from March to May, a delay in hiring additional cognizant system engineers to offset attrition and a delay in implementing the criticality safety program improvement plan from September 2010 to April 2011.

Transuranic Solid Waste Operations: This week, the site office approved a short duration (less than 5 months) transuranic solid waste sorting operation in the Dome 231 Permacon. LANL plans to use this processing line to remove WIPP-prohibited items from transuranic waste drums. The operation will be limited to 0.52 PE-Ci. During evaluation of this activity, the site office expressed concerns about the flammability of a strippable wall coating on the Permacon structure. To address this issue, the site office included conditions of approval that require removal of this coating within 3 weeks and additional controls pending removal of the coating. The site office also directed LANL to control ignition source proximity to the Permacon and establish a combustible control program. In addition to startup of this debris line operation, LANL is also pursuing installation of a second processing line at the Decontamination and Volume Reduction System Facility (Building 412).

Work Control: This week, the NNSA site office issued a letter to the laboratory contractor expressing concern over a series of recent events related to research and development and programmatic work that exhibit common weaknesses in work planning and control. The site office notes that similarities between the recent events and prior events (examples are cited dating back to 2002), indicate that previous corrective actions have not been effective or have degraded over time. Based on these observations, the site office asserts that achieving mature, sustainable work control implementation has lagged in the areas of research and development and other programmatic work. The NNSA letter also notes that similar observations related to work control deficiencies were identified in a December 2, 2009, letter from the DNFSB. To address these concerns, the letter directs the contractor to evaluate recent safety incidents and to provide to the site office by February 5th the actions that will be taken to improve institutional safety in programmatic and research environments (site rep weeklies 1/15/10, 12/18/09, 8/7/09, 7/24/09, 7/10/09).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 29, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 29, 2010

Radioactive Liquid Waste Treatment Facility (RLWTF): This week, LANL attempted to perform the first transuranic sludge drum tumbling activity in Room 60A since restart. The initial steps in this activity involve slurry and transfer of sludge from TK-7A, the sludge settling tank, to TK-6 and then gravity drain of the sludge to a waste drum. The transfer to TK-6 went as expected; however, during the gravity feed to the waste drum, a blockage in the system occurred such that only a couple of gallons of sludge were transferred to the drum (22 gallons were expected). To address the blockage, RLWTF personnel developed a temporary modification to allow backflush of TK-6. During installation of the modification, a small amount of sludge was released causing contamination in the area and on the personal protective clothing of one operator. Next week, RLWTF personnel plan to resume installation of the temporary modification to address the system blockage.

RLWTF personnel have made two transuranic liquid transfers from the WM-66 acid waste receipt tank into Room 60 tanks. These transfers provide sufficient tank space for the Plutonium Facility to make a transuranic liquid waste transfer, which is currently scheduled for mid-February.

Plutonium Facility – Isotopic Fuels Impact Test (IFIT): This week, LANL began the Laboratory Readiness Assessment (LRA) for IFIT operations at the Plutonium Facility. These operations involve impact testing heat source plutonium assemblies using an inert gas launcher to obtain data that will support engineering, quality assurance and NASA mission safety analysis. The last heat source plutonium test at IFIT was performed in 2001. Field observations associated with the LRA were completed on Friday and included an inert surrogate shot and drill (simulated loss of assembly and inner containment). The LRA team plans to complete their assessment next week. An NNSA Readiness Assessment is planned for late-February to support IFIT operations beginning in April.

Plutonium Facility - Fire Suppression System: Physical modification work has begun to address deficiencies associated with fire suppression system (FSS) components in one of the primary heat source plutonium processing laboratories. These deficiencies do not allow the FSS to provide the required fire water flow density to all areas of the room. Programmatic work in this laboratory is restricted until the fire suppression system modifications are complete, which could be as early as this weekend. Addressing fire-related vulnerabilities in this room are particularly important since it contains both a large amount of material at risk and a large quantity of combustible material in the form of thick plexiglass slabs used for radiation shielding (site rep weeklies 10/30/09, 10/23/09).

Fire Protection: In the late 1990's, the NNSA site office granted several equivalencies to National Fire Protection Association (NFPA) standards that allowed LANL facilities to perform required inspection, testing and maintenance (ITM) activities for fire suppression and alarm systems less frequently than prescribed by NFPA. Last week, the site office formally cancelled these equivalencies for LANL's nuclear and high hazard facilities and directed LANL to achieve compliance with the NFPA-mandated ITM frequencies within 60 days.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 5, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director

FROM: B.P. Broderick and R.T. Davis

SUBJECT: Los Alamos Report for Week Ending February 5, 2010

The site representatives were at DNFSB Headquarters in Washington, DC. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 12, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 12, 2010

Mr. Broderick was out of the office this week.

Radioactive Liquid Waste Treatment Facility (RLWTF): Last week, RLWTF personnel installed a temporary modification that allowed backflush of waste tank TK-6 and resolved the sludge blockage issue discussed in the January 29th site rep weekly. Since resolving this issue, LANL has completed several drum tumbling evolutions to produce cemented sludge drums for transfer to Area G and ultimately for disposition at the Waste Isolation Pilot Plant. On Thursday, RLWTF also received an acid waste transfer from the Plutonium Facility.

Plutonium Facility – Fire Suppression System: LANL recently completed upgrades and repairs to deficient areas (i.e., insufficient water flow density) of the fire suppression system in Room 201. Last Friday, LANL submitted a revision to the Justification for Continued Operations (JCO) to address restart of programmatic operations in Room 201 (i.e., heat source plutonium operations). The JCO revision also provides clarification for returning other deficient laboratory floor areas to increased operations as fire suppression system flow density issues are resolved.

Transuranic Waste Operations – RANT Shipping Facility: In July 2009, a Potential Inadequacy of the Safety Analysis was identified at the RANT shipping facility because facility smoke and heat detectors were identified as not complying with NFPA 72 requirements. These issues were identified by the site office during a safety system oversight review of the RANT safety significant fire suppression system. A JCO was approved that included compensatory measures (fire observer) when material-at-risk was inside the facility. The RANT fire suppression system uses a pre-action valve that must be actuated (based on a signal from the smoke and heat detectors) for the system to perform its safety function. LANL recently submitted a safety basis change that removes the smoke and heat detectors as credited components. Instead, LANL plans to make a system change that will result in pre-action valve actuation upon loss of nitrogen in the dry pipe system. Loss of nitrogen would occur when a sprinkler head activates due to heat from a fire. The site office is currently reviewing this safety basis change.

Weapons Engineering Tritium Facility (WETF): Last Friday, LANL submitted a safety basis strategy for pursuing safety basis changes and a 10 CFR 830 compliant Documented Safety Analysis (DSA) and associated Technical Safety Requirements (TSR). WETF is currently operating under a 2002 safety basis (with TSR page changes as recent as December 2009). In October 2009, the site office provided comments on most recently submitted DSA. The proposed WETF safety basis strategy includes three phases: 1) the initial near-term safety basis changes required to support risk reduction activities (i.e., tritium gas handling operations to support unloading containers that exceed their maximum allowable working pressure and restart of function testing operations); 2) an annual update that will address approximately half of the site office comments and 3) evaluation of WETF activities as part of the Integrated Nuclear Planning process and submittal of a safety basis that will address the remainder of the site office comments.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 19, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 19, 2010

Weapons Engineering Tritium Facility (WETF): On Thursday, WETF management declared a potential inadequacy in the safety analysis (PISA) based on issues with a facility fire wall. In 2006, LANL identified that the fire wall in question was degraded due to an inadequately sealed penetration. At that time, WETF personnel decided to eliminate credit for the fire wall vice pursuing corrective actions. During a recent NNSA site office safety system oversight review of the fire suppression system, assessors noted that the hydraulic calculations assume this fire wall is present and compliant. LANL fire protection initial evaluation of the situation indicates that the fire suppression system will not meet National Fire Protection Association requirements for water flow density without taking credit for this fire wall.

The NNSA site office currently has three full time engineers evaluating safety systems at LANL nuclear facilities. Over the last year, this group has identified a number of safety system deficiencies that resulted in the declaration of PISAs.

Transuranic Waste Operations: At an integrated nuclear planning workshop this week, LANL described plans for increasing processing capability and throughput to accelerate shipments to WIPP. In addition, LANL discussed Area G closure plans and planning to support an interim waste capability (i.e., how to accommodate waste generated after Area G stops accepting new receipts and before an enduring waste facility is operational). For the long term, LANL is pursuing a Consolidated Waste Capability concept that will address newly generated transuranic, mixed, and low level wastes and hazardous chemicals. The concept for the new transuranic project has been revised to include only capability for transuranic waste storage and characterization (i.e., no open-drum waste processing or size reduction). Transuranic waste generators will be required to have qualified processes to package only WIPP compliant containers. The line item project to establish a long term transuranic waste storage and characterization facility is nearing completion of a Safety Design Strategy and is aggressively pursuing a critical decision-1 in May 2010.

Also this week, operators using a glovebag inside the Dome 231 Permacon at Area G observed a flash of light while processing a transuranic waste drum to remove WIPP prohibited items. The flash occurred while operators were crushing small glass vials in a metal tray inside the glovebag. When the flash occurred, operators suspended operations and notified the Operations Center. No singeing or charring was evident as a result of the flash; however, operators did observe a brown powder released from a recently crushed vial. Information about the event became confused in the notification chain resulting in Operations Center and supervisory personnel authorizing processing operations to resume to address the few remaining contents of the affected drum.

The critique of this event identified a number of areas requiring corrective action. First, the procedure governing Permacon drum remediation activities did not address whether or how to process small glass vials and did not analyze the hazards that could result from crushing vials containing potentially pyrophoric or reactive materials. Also, a similar event occurred at the WCRR processing facility and the lessons learned associated with handling small glass vials were not incorporated into Permacon operations. Glovebag operations in the Dome 231 Permacon have been suspended until the procedure is

revised and operators trained to address proper handling of small glass vials.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 26, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 26, 2010

Staff members Galaska, March, Moury and Pasko held a teleconference with NNSA and LANL personnel to discuss fire protection issues including plans to address recommendations from the 2009 Baseline Needs Assessment and improvements in fire fighter training and facility familiarity.

Plutonium Facility: This week, LANL declared a Potential Inadequacy in the Safety Analysis (PISA) based on a potential issue with the safety class ceiling armor for the Isotope Fuel Impact Test (IFIT) facility. The ceiling armor is designed and implemented to prevent a projectile from breaching the facility (projectiles are gas propelled in the vertical direction). The technical safety requirements note that the armor is designed to withstand a projectile with speeds up to 200 m/s; however, there are no safety class controls that protect this assumption (e.g., a relief valve that would limit the maximum projectile velocity is installed but is not credited as safety class). This issue was identified during the recently completed laboratory readiness assessment. The NNSA readiness assessment is scheduled to begin the week of March 8th.

Weapons Engineering Tritium Facility (WETF): During LANL's continuing evaluation of issues identified by NNSA site office safety system oversight engineers (see last week's report), WETF management declared a PISA for the Building TA-16-450 (the building adjacent to WETF's primary tritium processing facility) safety significant fire suppression system. In the basement of this building, lighting fixtures physically block fire suppression system sprinkler heads. LANL has been aware of this vulnerability for several years (the issue was noted in a September 2007 Fire Hazards Analysis) and there is an upgrade planned to resolve the issue; however, this vulnerability is not identified in the safety basis and the PISA process was not pursued until this week. This issue was also not identified in a vital safety system assessment that was performed for the system. A walkdown by site office and LANL fire protection engineering concluded that with the current combustibles in the basement, the sprinkler system could perform its safety function. WETF management has established access control to help ensure additional combustibles are not added while a system upgrade is completed to resolve this issue.

Fire Protection: Last October, a LANL memorandum to the site office suggested that the standing Cooperative Agreement between NNSA and Los Alamos County be revised to address several recommendations in the Baseline Needs Assessment. Last week, the NNSA site office issued a response to the LANL memorandum asserting that gains in fire and emergency response effectiveness and timeliness can be achieved without modifying the existing Cooperative Agreement. The NNSA response directs the laboratory to take a series of actions that contribute to satisfying BNA recommendations and improve response services. Directed actions include coordinating with the Los Alamos County Fire Department to develop Fire Chief's Directives that describe and document laboratory-specific fire and emergency response issues and to develop response time metrics that can be tracked and trended to identify opportunities for improvement.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 5, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 5, 2010

This week, Board members J. Bader, L. Brown, J. Mansfield and P. Winokur along with staff members T. Dwyer, M. Moury and J. Pasko were onsite to meet with NNSA site office and LANL personnel to discuss Recommendation 2009-2 and activities at LANL defense nuclear facilities.

Plutonium Facility – Seismic Safety: LANL described the plans and progress on risk reduction activities at the Plutonium Facility that will be captured in a seismic safety strategy, which is expected to be issued this month. Near-term actions to be completed by the end of calendar year 2010 are expected to further reduce the potential offsite dose consequence for the bounding seismically-induced fire scenario. The plan will also include longer term actions to evaluate and potentially upgrade key safety systems (fire suppression and ventilation systems).

Transuranic Waste Facility Project: This week, LANL submitted the Safety Design Strategy, developed in accordance with DOE-STD-1189, for the Transuranic Waste Facility (TRUWF) to the site office for review. The scope of the TRUWF includes waste storage and characterization functions only (i.e., no open-drum waste processing or size reduction). The safety strategy currently does not anticipate the need for safety class structures, systems or components. Safety significant control functions identified are the facility structure, fire suppression system (in storage buildings), transuranic waste containers, and controlled separation distance between storage buildings to prevent fire propagation. The safety strategy asserts that because of the confinement provided by containers, no safety related building confinement or exhaust ventilation will be necessary. The seismic design criteria (SDC) for the storage buildings and associated fire suppression systems are expected to be SDC-2. A LANL safety design integration team, as recommended by DOE-STD-1189, has been chartered for this project.

Work Control: In February, the LANL Principal Associate Directors for Science, Technology and Engineering; Weapons Programs; and Global Security issued a joint response to a January NNSA site office letter that highlighted recent safety incidents involving research and programmatic operations and requested corrective action. The LANL response identified areas, including hazard definition and evaluation, where the implementation of institutional work control processes were inconsistently applied across the laboratory.

In their response letter, LANL senior management outlines a plan to address the areas of inconsistency and improve the safety of research and development (R&D) activities. Steps in the improvement plan include developing common approaches for defining the safety envelope for moderate hazard R&D work, improving the training and supervision of students and post-docs, and identifying communities of expertise in elevated risk areas that can be drawn upon to peer review proposed experiments to strengthen subject matter expert review. The LANL Principal Associate Directors also commit in the letter to meet with site office personnel quarterly to provide progress reports (site rep weekly 1/22/10).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 12, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 12, 2010

Plutonium Facility – Isotopic Fuel Impact Test (IFIT) Facility: This week, NNSA completed the Readiness Assessment (RA) for operation of the IFIT Facility to support testing required by NASA. The RA team recommends that operations commence following site office approval of closure for pre-start findings and corrective action plans for post-start findings. The team identified five pre-start findings including issues with the design and procurement of safety significant components, procedure inconsistencies/errors, operator qualifications/work authorization status and unanalyzed hazards associated with a crane.

Transuranic Waste Operations: LANL has not performed transuranic waste drum venting since the November 2008 drum deflagration that occurred during remote drum venting operations in Area G. The remote drum venting operation was performed in a tent containment enclosure inside of Dome 33. In April, LANL plans to begin drum venting operations in a robust enclosure that will be provided by a subcontractor. The same enclosure unit was used for drum venting operations at the Savannah River Site. The Joint Evaluation Team met this week to discuss the plans for evaluating readiness for this activity and will recommend a laboratory RA to the site office. LANL estimates that between 1,000 and 3,000 drums (including both above and below ground drums) will require installation of filtered vents using this system.

Weapons Engineering Tritium Facility (WETF): Last week, LANL declared a TSR violation based on exceeding the combustible loading limits for two WETF rooms. LANL also declared a Potential Inadequacy in the Safety Analysis (PISA) due to inadequate documentation for calculations associated with combustible loading limits (this issue was later declared a positive unreviewed safety question). These issues resulted from evaluation of issues identified during a site office safety system oversight review. In accordance with the Limiting Condition of Operation (LCO) action statement and based on previously identified issues with the fire suppression system, WETF was placed in warm standby and a fire watch patrol was established every hour (the LCO requires a fire watch patrol every two hours).

The combustible loading limit LCO also requires WETF to comply with the limits within one week (due Thursday of this week) or to begin actions to place the facility in cold standby mode (i.e., all but residual quantities of tritium removed from process areas). The actions required to comply with the combustible limits could not be completed by Thursday of this week (a TSR revision will likely be needed). In addition, placing the facility in cold standby would require movement of tritium in systems that are not currently operable and require readiness activities to restart. As a result, LANL submitted a Justification for Continued Operation that allows a 60 day extension for the completion time of the LCO action statement (i.e., coming into compliance with the combustible loading limits). The JCO requires WETF to remain in warm standby mode and to continue hourly fire watch patrols. LANL also committed to providing a path forward for resolving this issue within 30 days. On Thursday, the site office completed a Safety Evaluation Report that approved the LANL JCO.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 19, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 19, 2010

Transuranic Waste Operations: There have been three glovebox glove breaches or failures at the WCRR repackaging facility in the last two weeks. Prior to this series of events, unplanned glovebox glove openings had been infrequent at WCRR. The most recent event, which occurred on Wednesday, resulted in a glovebox worker receiving skin contamination (1600 dpm/100 cm²) with subsequent nasal smears positive for low levels of alpha radioactivity (42 dpm). Facility management has responded by suspending WCRR glovebox operations while glovebox glove inspection protocols are strengthened.

Transuranic Waste – Sort, Segregate, Size Reduction and Repackaging (SSSR): Late last year, the site office approved a safety basis change for Area G to support SSSR operations in five structures (e.g., TA-54-412 and dome structures). The safety basis change included material-at-risk limits for open waste of 12.5 PE-Ci equivalent combustible waste for all of Area-G and 2.5 PE-Ci for each individual SSSR operation. During development of the Area G Basis for Interim Operation, LANL identified a defense in depth control for separation distance between metal and non-metal transuranic waste containers and the SSSR operations to help prevent fire propagation. This week, LANL submitted a safety basis change that will include the separation distance control in the current Area G safety basis (site rep weekly 8/7/09).

Radioactive Liquid Waste Operations: This week, LANL declared the Waste Management Risk Mitigation tank farm operational as a radiological facility to receive low level waste during emergency conditions. This action provides 250,000 gallons of storage capacity that could be used for the following three entry conditions: 1) RLWTF is operable but overflow of the influent storage tank is imminent (e.g., large low level liquid influent due to fire deluge system operation at a generator facility), 2) RLWTF is not operable and overflow of the influent tank is imminent (e.g., major equipment failure) and 3) lab-wide evacuation (site rep weekly 10/30/09).

Weapons Engineering Tritium Facility: In February, LANL requested a temporary safety basis change to allow introduction of low-pressure inert gas into portions of the tritium systems in order to calibrate instruments and to verify compliance with safety basis requirements (i.e., hazardous material protection and pressure safety programs). LANL also requested an extension for a Justification for Continued Operation associated with exceeding the Maximum Allowable Working Pressure for two Standard Tubs (this issue will not be resolved prior to when the JCO expires). This week, the site office approved the temporary safety basis change and the JCO extension. The JCO now expires in March 2011 or when processing is complete, whichever is sooner.

The site office also approved a temporary safety basis change to address facility combustible loading issues that resulted in a TSR violation and Unreviewed Safety Question. This temporary safety basis change will remain in effect until June 30, 2010 or until the safety basis combustible limits are changed permanently based on appropriate engineering analysis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 26, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 26, 2010

Transuranic Waste Operations: Facility management declared a TSR violation at the WCRR repackaging facility this week. During an emergency exercise involving the Los Alamos County Fire Department (LAFD), emergency responders opened the WCRR vehicle access system barriers to gain entry to the scene of a simulated event. Opening the vehicle access system barriers while material-at-risk was present inside the WCRR facility perimeter violated a Specific Administrative Control. LAFD personnel never received any indication that opening access barriers presented a problem for the facility; they were acting in accordance with their pre-incident plan and alerted the WCRR operations center that they were opening barriers. On the facility side, a number of opportunities to identify and prevent the safety basis impact from this exercise were missed, including participation in exercise planning and the final exercise plan being subjected to the unreviewed safety question process.

In response to this event, facility management will now require all final exercise plans for transuranic waste facilities to require approval by the Facility Operations Director. Conducting exercises at nuclear facilities across the site are an important part of continuing to improve the coordination between LANL and LAFD. Since proper planning and control of these on-going exercises are critical to ensuring that nuclear safety hazards are not inadvertently introduced and safety basis controls are not compromised, broadening the corrective action requiring FOD approval of exercise plans to apply to all nuclear facilities may warrant consideration.

Sitewide Seismic Hazards: This week, the site office approved removal of a number of facilities, or facility segments (Chemistry and Metallurgy Research Building - Vault and Storage Wells, TA-55 Interim Radiography Tunnel, Radioactive Liquid Waste Treatment Facility, Weapons Engineering Tritium Facility, WCRR repackaging facility and the RANT shipping facility) from the Seismic Analysis of Facilities and Evaluation of Risk (SAFER) Justification for Continued Operation (JCO). LANL evaluated safety systems that are required to perform a seismic safety function for each of these facilities against the updated probabilistic seismic hazards analysis and concluded that system performance during a seismic event is consistent with that credited in facility safety bases. The seismic evaluation basis for each of these facilities and systems was reviewed by an external peer review team. Although the SAFER JCO for the Plutonium Facility is currently scheduled to expire at the end of May 2010, it is likely that LANL will request an extension to complete the evaluation.

Plutonium Facility – Safety Basis Implementation: LANL has completed the 3rd phase of the 2008 DSA implementation effort at the Plutonium Facility including completion of Implementation Verification Reviews. In February, the site office approved extending the implementation period for this DSA from the end of March to the end of May. In the 4th and final phase of implementation, LANL will complete actions to achieve a safety class fire suppression system for non-seismic fire scenarios. The final phase also includes implementation of controls on material-at-risk and transient combustible loading, as well as, several safety management programs (e.g., fire protection and glovebox transient combustible programs) and safety design features (e.g., glovebox support stands). The site office continues review of the Plutonium Facility's 2009 DSA annual update submittal.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 2, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 2, 2010

Plutonium Facility – Seismic Hazards: This week, LANL requested an extension for completing the seismic analysis of the Plutonium Facility against the updated probabilistic seismic hazard assessment. The existing Justification for Continued Operation (JCO) that addresses this issue will expire on June 30, 2010 for the Plutonium Facility. LANL's preliminary evaluation of the facility indicates the need to perform a more sophisticated probabilistic analysis. The new schedule to complete analyses for the facility structure and key safety systems is December 2010. The completion date also includes evaluation of portions of the ventilation system and the fire suppression system against performance category-3 criteria. This information will be needed to make decisions on safety system upgrades to improve the facility safety posture for challenging seismically-induced accident scenarios. The proposed JCO would expire in March 2011 (the additional time would be used to complete and seek approval for any required safety basis changes).

Plutonium Facility – Safety Basis: This week, Plutonium Facility management declared a potential inadequacy of the safety analysis (PISA) based on a discrepancy between a TSR material-at-risk (MAR) limit and the supporting analysis in the DSA. The MAR limit, which controls the amount of dispersible Pu-238-enriched heat source plutonium (HS-Pu) allowed in individual gloveboxes, excluded several forms of HS-Pu, including sintered oxide pellets. Although these material forms are not highly dispersible, the DSA does not discuss or justify a basis for excluding them from the glovebox MAR limit in the TSRs.

In response to the PISA, the affected material forms will be counted toward the glovebox MAR limit until a Justification for Continued Operations or DSA page change is submitted and approved. Also, facility personnel have confirmed that no gloveboxes currently exceed their MAR limit when the previously excluded forms are added to the glovebox MAR inventory calculation.

Plutonium Facility – HS-Pu Containerization: In FY09, LANL personnel overpacked into safety class containers 60 of the roughly 160 HS-Pu-bearing Russian Product Containers (RPC) stored in the vault water bath. The campaign to overpack the remaining RPCs, which is required to be complete by the end of June 2010, has been on-hold awaiting the procurement and testing of a new, more robust safety class container. This new container successfully completed a series of burst tests recently that demonstrated it far exceeds the performance criteria required of safety class containers. NNSA is now reviewing a LANL request to begin using these new containers to overpack the remaining RPCs prior to the completion of a series of drop tests that are not expected to challenge the extremely robust construction of the new container (Board Letter dated 4/7/09).

Plutonium Facility – Isotopic Fuel Impact Test Facility: The site office approved resumption of testing operations this week based on satisfactory closure of all pre-start findings and approval of corrective action plans for post-start findings identified during the NNSA Readiness Assessment for the Isotopic Fuel Impact Test Facility. LANL plans to begin hot operations next week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 9, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 9, 2010

Both site representatives were offsite this week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 16, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 16, 2010

This week, staff members R. Arnold, F. Bamdad, C. Butch, D. Eyler, P. Fox and R. Oberreuter were onsite to review the Radioactive Liquid Waste Treatment Facility – Upgrade Project. In particular, the staff evaluated the resolution of issues identified in the Board’s March 2008 and February 2009 letters, with a specific focus on NNSA efforts to improve federal oversight, the integration of safety into the facility design and the adequacy of the project’s 60% design package.

Plutonium Facility: On Tuesday, a machine tool head associated with the robotic lathe for the ARIES process disengaged from the lathe and briefly pinned a worker’s hand. The worker was tightening a locking mechanism on the lathe and had his hand extended into the glovebox where the lathe is located. Personnel in the area responded to free the worker’s hand and contact radiological protection personnel. No glove breach occurred and worker was taken to occupational medicine with only minor injuries. LANL evaluation of the event concluded that the tool head moved beyond the end of the tool track while the worker was tightening the locking mechanism, which allowed the tool head to disengage from the lathe. No mechanical end stop was present to prevent disengagement. Corrective actions include installation of an end stop for this particular lathe and evaluation of other machining operations at the Plutonium Facility to ensure end stops are installed, where appropriate.

Radioactive Liquid Waste Treatment Facility (RLWTF): During low level waste operations at RLWTF, a worker identified a spill that appeared to have come from the raw daily feed sample line. The worker donned personal protective equipment (booties), entered the area and concluded that the spill did not appear to be growing. After exiting the area, the worker contacted the shift operations manager. The spill was evaluated by radiological protection personnel and samples indicated approximately 60 nCi/L contamination with a pH of 7.5. Facility personnel subsequently cleaned up and decontaminated the area. RLWTF personnel are developing a plan to identify and correct the source of the leak. Other corrective actions include creating a spill response team (similar to the team implemented at the Plutonium Facility) and issuing a lesson learned notice reminding workers of appropriate spill response protocols.

Transuranic Waste Facility Project: Transuranic Waste Facility Project personnel recently submitted a Conceptual Safety Design Report (CSDR) for NNSA review and approval. The current project scope includes six segregated storage buildings intended to accommodate a total of 1,240 drum equivalents and a concrete pad to house drum characterization trailers. Open drum remediation and size reduction activities are not part of the project’s scope. The CSDR postulates ten design basis accidents that can involve up to 27,300 Pu-equivalent Ci of material-at-risk. The CSDR identifies six safety class structures, systems or components to prevent or mitigate these accidents. Safety class controls include vehicle barriers to prevent a vehicle accident with resulting pool fire, controlled space with few or no combustibles around storage buildings to prevent thermal insults from wildfires or propagation of fire from one building to another, and a seismic switch to de-energize electrical equipment to prevent a seismically-induced fire. The storage building structures and fire suppression systems are designated safety significant and seismic design category 2.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 23, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 23, 2010

Weapons Engineering Tritium Facility (WETF): LANL continues actions to restart tritium gas transfer and handling operations to support current plans to unload tritium containment vessels that may exceed their maximum allowable working pressure and to support tritium material-at-risk reduction efforts. WETF restart plans now include performance of both a Contractor Operational Readiness Review and an NNSA Operational Readiness Review, currently planned for late-May and late-June, respectively. WETF personnel also plan to perform several function test activities to support an important programmatic need this summer. Restart of the tritium function test system was planned to occur after the initial restart that will be covered by the readiness reviews. To ensure support for this programmatic deliverable should the current restart schedule slip, WETF personnel are evaluating options that will allow safe and timely restart of the function test system as a priority.

Transuranic Waste Operations: This week, the Facility Operations Director declared a potential inadequacy of the safety analysis (PISA) at the WCRR repackaging facility. The PISA resulted from a discovery that the safety significant WCRR drum lift fixture was not anchored to the floor slab and therefore could not perform its credited safety function of preventing a transuranic waste drum drop during a seismic event. A 2007 seismic analysis of the drum lift fixture that included a Seismic Qualification User Group (SQUG) walkdown and another analysis performed in 2009 to support the SAFER project both concluded that this system could perform its seismic safety function based on an incorrect assumption that the drum lift fixture was securely anchored to the floor. As a result of the PISA, facility management has prohibited the introduction of material-at-risk into the WCRR facility until a Justification for Continued Operations is approved by the NNSA site office.

Glovebox Safety: The WCRR repackaging facility has had six glove breaches associated with its Waste Characterization Glovebox in the past two months, including several that resulted in personnel contamination and one that resulted in positive nasal smears. Prior to this series of events, glove breaches had been infrequent at WCRR. In response to this adverse trend, facility personnel engaged subject matter experts from the lab's Institutional Glovebox Safety Committee. Based on recommendations from the committee, WCRR will begin using longer cut and puncture resistant gloves over glovebox gloves to provide greater protection against objects that could cause breaches. The committee also recommended that protective over-gloves be worn whenever operators have their hands in the Waste Characterization Glovebox. Current WCRR procedures require the use of these over-gloves when active waste sorting and processing operations are being conducted, but do not require use of protective over-gloves during subsequent glovebox clean-out and wipe-down activities where latent hazards that could challenge unprotected glovebox gloves may exist.

WCRR personnel have also strengthened their glovebox glove receipt inspection protocols. Using the new more stringent inspections, facility personnel have rejected high percentages of gloves received from the Plutonium Facility's quality component warehouse. Typical rejection rates have been around 10-15%, but one recent lot approached 90% rejection. Based on this and other data, institutional quality assurance receipt inspections for glovebox gloves from the affected manufacturer have recently been increased from 20% sampling to 100% inspection.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 30, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 30, 2010

Chemistry and Metallurgy Research (CMR) Building: LANL recently began construction activities for the Permacon structure in Wing 9 that will support the Confinement Vessel Disposition project. This project will provide the capability to initially perform gross removal of transuranic material from the 6' confinement vessels (one at a time) with follow-on activities to reduce contamination such that the vessels can be dispositioned as low level waste. Construction activities are expected to continue through this year followed by startup and readiness activities (at this point, contractor and NNSA operational readiness reviews are expected). The first vessel is scheduled to be processed in late-2011.

Safety Basis: This week, LANL resubmitted the CMR Documented Safety Analysis and Technical Safety Requirements that will support post-2010 operations. The resubmittal is expected to resolve previous site office comments provided in March. An NNSA Safety Evaluation Report is expected in late-May followed by LANL implementation confirmed via Implementation Verification Reviews to be completed by the end of calendar year 2010.

Other key safety basis documents for LANL nuclear facilities are pending submittal. A revised DSA and associated TSRs for the Plutonium Facility are scheduled to be submitted for NNSA review and approval in mid-May. These documents will serve as an Annual Update to the 2008 safety basis that is in the final stage of implementation at the Plutonium Facility. Additionally, a Basis for Interim Operations (BIO) and supporting TSRs for Area G are scheduled to be submitted to NNSA in June. Area G is currently operating under a DSA that was approved in 2003.

Plutonium Facility: This week, Plutonium Facility personnel resumed the campaign to retrieve ²³⁸Pu-bearing Russian Product Containers (RPC) from the vault water bath and overpack them in safety class Fuel Storage Outer (FSO) containers. About 60 RPCs were overpacked in FY-09 before the effort was paused to allow testing, qualification and procurement of an even more robust safety class container known as the Next Generation FSO. Prior to resuming overpack operations this week, approximately 100 RPCs remained in the vault water bath. Program personnel intend to complete the RPC overpack campaign by June 30th, using a combination of FSO and Next Generation FSO containers (Board letter dated 4/7/09).

Work Control: LANL recently completed a project execution plan for moderate hazard research and development safety improvements in response to a January site office letter that expressed concerns about recent safety incidents at the laboratory. The plan defines the approach for achieving hazard identification and evaluation that appropriately engages workers, operates within a defined safety envelope with well-understood risks for each experiment and accommodates the dynamic nature of research and development activities. Twelve baseline sub-projects have been identified with completion dates through the end of this fiscal year including plans to improve subject matter expert and peer review involvement in work control/hazard identification, pre and post-job briefs, hazard analysis training and lessons learned (site rep weeklies 3/5/10, 1/22/10).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 7, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 7, 2010

The site representatives were at DNFSB Headquarters in Washington, DC. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 14, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 14, 2010

Weapons Engineering Tritium Facility (WETF): LANL continues actions to resume tritium gas handling operations at WETF to support tritium containment vessel unloading, material-at-risk reduction and to support programmatic testing needs (i.e., function test operations). Recently, LANL recommended the following two options to restart function test operations, which is necessary to support important programmatic deliverables: A) complete contractor and NNSA operational readiness reviews (ORRs) for phase 1 (i.e., unloading and low pressure gas handling/glovebox systems) followed by a contractor readiness assessment to support function test operations or B) if the schedule for option A cannot be maintained, then seek an exemption to DOE Order 425.1C, *Startup and Restart of Nuclear Facilities*, in order to conduct a contractor readiness assessment for function test operations (and required gas handling/glovebox systems) solely to support the execution of a series of function tests required for programmatic deliverables. Last week, the site office approved option A as the preferred plan with preparations to execute option B as the backup plan. The site office directed LANL to obtain LASO approval if it becomes necessary to execute option B. LANL currently remains on the option A plan with a management self assessment being conducted this week and the contractor ORR scheduled to begin on May 24th.

LANL also recently submitted a safety basis strategy for WETF that details their plans to submit a safety basis annual update no later than July 31, 2010 and a new Documented Safety Analysis by the end of FY 2011. The safety basis strategy notes that current tritium inventory is higher than what is required to support the anticipated enduring mission at WETF and that material-at-risk reduction over several years is expected to reduce the tritium inventory from the current safety basis limit of 400 grams to approximately 100 grams.

Plutonium Facility: This week, facility management declared a potential inadequacy of the safety analysis (PISA) based on the recognition that hazards may not be fully analyzed for four metallic heat source plutonium (HS-Pu) items currently stored in shelf locations in the facility's vault. These Pu-238 enriched items were made in the late 1990's to support a programmatic activity that is now complete. One item contains greater than 100 grams of HS-Pu sealed in a welded inner container that is overpacked in a container with a filtered vent. The other three items, believed to involve small quantities of HS-Pu, are welded in sealed sample vials that are not contained in filtered overpacks. Facility personnel are evaluating these four items for potential container pressurization hazards related to high internal temperatures and helium buildup from the high specific activity of Pu-238. Management has prohibited handling these items pending the results of further evaluation.

Chemistry and Metallurgy Research Building (CMR): CMR personnel have transferred roughly 40 grams of non-dispersible Cm-244 from Wing 9 floor well storage locations to a hot cell for repackaging to support offsite disposition of this material. From a material-at-risk standpoint, this small quantity of curium represents greater than 40 kg of Pu-239-equivalent and required NNSA site office notification to introduce into the hot cells. LANL personnel intend to have all material out of floor well storage by the end of this calendar year. Material currently stored in floor wells that cannot be shipped to another on-site or off-site location will be staged in hot cells or the CMR vault.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 21, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 21, 2010

Staff member J. Pasko was onsite this week to attend the Integrated Nuclear Planning workshop.

Integrated Nuclear Planning: This week, LANL conducted an Integrated Nuclear Planning workshop with participation from NNSA Headquarters, service center and site office personnel. The focus of this workshop was on TA-55 programs, projects and facilities with particular focus on the path forward to address changing programmatic direction as a result of the Nuclear Posture Review. The workshop also covered the impact and integration of construction projects in the Pajarito Corridor (i.e., in and around TA-55).

Plutonium Facility - ARIES: LANL continues development and operation of the Automated Retirement and Integrated Extraction System (ARIES) to support the Pit Disassembly and Conversion Project (PDCP) and the MOX Fuel Fabrication Facility (MFFF). In March, LANL received certification as an approved supplier for MOX Services. This fiscal year, the baseline for ARIES is to produce and package 50 kgs of plutonium oxide with a stretch goal of an additional 50 kgs. The current commitment is to provide 2000 kgs of plutonium oxide to the MFFF by the end of 2018. LANL also continues support activities for the PDCP design authority.

Plutonium Facility – Safety Basis: Last week, LANL management requested an extension to complete full implementation of the technical safety requirements associated with the 2008 Documented Safety Analysis from May 31 to August 12, 2010. LANL requested the delay to allow additional time to complete (1) physical modifications to the fire suppression system in support of the new safety class designation for non-seismically initiated facility fires, (2) technical baseline documentation of glovebox support stands, and (3) final implementation activities related to the new software application to track and control facility material-at-risk limits.

This week, physical modifications to the fire suppression system began to address previously identified fire water flow density deficiencies. These modifications involve installing additional fire water riser piping to tie-in the laboratory floor and basement suppression system distribution lines to overcome hydraulic losses in the current facility configuration that cause flow density issues. Verification and validation of the actual software associated with the new computerized material-at-risk tracking program is complete. Work continues to configure and benchmark the software for reliable implementation at the Plutonium Facility.

Weapons Engineering Tritium Facility (WETF): On Monday, a NNSA facility representative noted that on two recent occasions WETF personnel failed to log performance of ceiling tile inspections as required by a Justification for Continued Operations (JCO). The JCO that included this compensatory measure was issued in response to deficiencies identified for a fire wall. Corrective actions included additional personnel training. For tritium gas handling restart, the contractor Operational Readiness Review, which was previously scheduled to begin next week, has been delayed to early-June; however, the schedule for the NNSA ORR has not changed (late-June).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 28, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 28, 2010

Plutonium Facility – Fire Suppression System: NNSA site office safety system oversight engineers, augmented by HSS personnel, are conducting an assessment of the TA-55 fire suppression system upgrades and implementation efforts to support the system's new safety class designation for non-seismic fire scenarios. This system is being upgraded as a part of the 2008 safety basis implementation, which is now expected to be complete in August. This week, site office personnel provided preliminary feedback that included the following potential issues: additional actions are required to meet some NFPA requirements (both system configuration and maintenance); the System Design Description has not been updated to reflect the new safety class function; some aspects of the fire hazard analysis do not appear consistent with the safety basis and; some technical assumptions require verification (i.e., supply tank level and diesel day tank volume). LANL plans to address these issues as they continue safety class fire suppression implementation. A gap analysis against the *Interim Guidance on the Design and Operation of Wet Pipe Sprinkler Systems and Supporting Water Supplies* that is associated with Board Recommendation 2008-1 is also planned. The NNSA assessment team plans to continue their review once implementation is nearing completion.

Plutonium Facility – Criticality Safety: A recent critique of a suspected criticality safety infraction at the Plutonium Facility highlighted issues associated with software quality assurance and methods of ensuring compliance with criticality safety limits. Last week, facility personnel implemented a change to the Plutonium Facility's material control and accountability software without satisfying all requirements specified in LANL's institutional software quality assurance procedure. This software change caused the mass of certain containerized items to be counted twice in inventory totals. When operators in the analytical chemistry group attempted to perform a material transfer, this double counting error led them to believe they had slightly more material in a glovebox than allowed by the criticality safety posting. Based on the information available at the time, a criticality safety infraction was declared. The software error was discovered in the process of investigating the criticality safety infraction. During the critique of this event it became apparent that the analytical chemistry group, which routinely deals with large numbers of low mass samples, was relying solely on the material accountability software to ensure compliance with criticality safety limits. This practice violates the Plutonium Facility's criticality safety procedure which prohibits sole reliance on accountability software for criticality safety purposes because the software does not have the quality assurance pedigree required for safety software. Facility management intends to perform an extent of condition review to identify any other groups relying solely on accountability software for criticality safety.

Transuranic Waste Facility (TRUWF) Project: LANL continues conceptual design activities to support a critical decision-1 (CD-1), *Approval of Alternative Selection and Cost Range*, for the TRUWF that will provide an enduring solid transuranic waste capability for the site. A joint NNSA/LANL design review of the CD-1 package is scheduled for early-June with a Technical Independent Project Review scheduled for mid-July. In addition, the site office is reviewing the recently submitted Conceptual Safety Design Report.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 4, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 4, 2010

Weapons Engineering Tritium Facility (WETF): LANL began the contractor Operational Readiness Review (ORR) to confirm readiness to resume tritium gas transfer operations on Thursday following line management declaration of readiness. All but two pre-start findings identified during the management self assessment have been closed and closure plans and schedules are in place for the two remaining findings. The NNSA ORR is scheduled to begin the week of June 21st.

Plutonium Facility: The Plutonium Facility Documented Safety Analysis (DSA) that was approved by NNSA in 2008 and is currently being implemented by LANL identified a suite of planned safety improvements that include seismic upgrades to a population of 'high risk' gloveboxes. The DSA criteria for high risk included gloveboxes that contain ignition sources or greater than 10 kg of material at risk. Because these glovebox upgrades play a key role in the facility's existing seismic safety strategy, the NNSA Safety Evaluation Report (SER) that approved the 2008 DSA included a Condition of Approval to accelerate the schedule for glovebox seismic upgrades such that all high risk gloveboxes meet performance category 3 seismic requirements by the end of 2011. LANL uses this commitment for future glovebox seismic upgrades to reduce the mitigated dose consequence for a seismically-induced spill scenario by a factor of 10 (i.e. a damage ratio of 0.1 is credited).

LANL intended to use Phase 2 of the line item TA-55 Reinvestment Project (TRP2) to complete seismic upgrades for all high risk gloveboxes. However, the expected cost of seismic upgrades to individual gloveboxes has risen from an original estimate of about \$80,000 per glovebox to a current estimate of approximately \$850,000. Concurrent with this order of magnitude cost increase, LANL personnel completed a comprehensive facility survey and identified 157 high risk gloveboxes, roughly twice as many as originally expected. The current scope of TRP2 would upgrade a total of 40 gloveboxes through 2014. LANL has not yet clearly defined the strategy and schedule for performing required seismic upgrades for the large population of remaining high risk gloveboxes that will not be addressed by TRP2.

Chemistry and Metallurgy Research Building (CMR): This week, the NNSA site office issued a SER approving the CMR DSA that supports continued facility operations after the current Basis for Interim Operations expires at the end of 2010. This new safety basis must be implemented by the end of the calendar year. The newly approved DSA includes a seismically-induced fire scenario with final mitigated consequences that exceed the DOE Evaluation Guideline by approximately 45%. In the SER, the NNSA site office accepts the risk associated with this scenario based on the low likelihood of the event and the limited life and needed mission of the facility.

Also this week, LANL recommended to the site office that an ORR be performed to confirm readiness for confinement vessel disposition (also known as Bolas Grande) operations in Wing 9 of CMR. Although the Joint Evaluation Team, which evaluates startup activities and recommends the level of readiness review, concluded that a readiness assessment be performed, LANL management determined that an ORR is a better vehicle for confirming readiness for this activity. Construction activities to support confinement vessel disposition are ongoing with startup planned for late-2011.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 11, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 11, 2010

Staff members Laake, Martin, and Von Holle were onsite this week to review implementation of DOE-NA-STD-3016, *Hazard Analysis Reports for Nuclear Explosive Operations*, at Los Alamos.

Weapons Engineering Tritium Facility (WETF): The Contractor Operational Readiness Review (CORR) to support resumption of programmatic gas transfer operations at WETF concluded this week. The final report is undergoing factual accuracy review by facility personnel, but preliminary findings were discussed at an outbrief on Friday. Roughly a dozen pre-start findings were reported at the outbrief, of which six were closed during the review. The follow-on federal ORR is currently targeted to begin the week of June 21st.

Chemistry and Metallurgy Research (CMR) Building: NNSA and LANL plan to continue performing mission-critical analytical chemistry operations in the CMR Building until the CMR Replacement (CMRR) Facility is constructed and commissioned. The recently issued Nuclear Posture Review targets transition from the existing CMR Building to the new CMRR Facility in 2021. The overarching strategy for operating CMR until CMRR is available is documented in the CMR Facility Consolidation and Risk Mitigation Program Execution Plan (CMR PEP). A central tenet of the operating strategy described in this document is to continuously reduce the amount of material at risk (MAR) associated with CMR operations over time. The CMR PEP establishes a series of activities designed to reduce the quantity of MAR required to perform key analytical chemistry operations in CMR. Relocating Pu-238 analytical chemistry operations and sample management operations to the Plutonium Facility are two important planned activities designed to enable MAR reduction at CMR over time. The implementation schedules for both of these relocation efforts have slipped significantly from their original completion dates meaning that the opportunities for CMR MAR reduction they will create will be delayed. Recently, LANL senior management has refocused attention on these relocation projects in recognition of the key role they play in supporting commitments to continuously reduce the MAR associated with CMR over time.

Transuranic Waste Operations: This week, facility management declared a TSR violation at the WCRR repackaging facility when a can of flammable liquid was discovered in WCRR while MAR was present in the facility. WCRR credits stringent combustible loading controls including a limiting condition of operation that prohibits the use or storage of flammable or combustible liquids or gases in the facility when MAR is present. A can of flammable spray paint was brought into the facility to support a painting evolution last weekend when the facility was in cold standby mode. The can of flammable spray paint was not removed when the painting work was completed and multiple surveillances credited to confirm that no flammable liquids or gases were present in the facility failed to identify and remove the can, as required, before the facility entered warm standby mode and introduced MAR.

Also this week, laboratory management authorized the startup of debris waste processing activities in Building 412 at Area G. These operations will use a glovebag inside a containment tent to remove WIPP-prohibited items from waste drums containing less than 0.52 ²³⁹Pu-equivalent Ci.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 18, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 18, 2010

Plutonium Facility: LANL recently completed overpacking all ^{238}Pu -bearing Russian Product Containers (RPCs) into safety class Fuel Storage Outer (FSO) containers. In response to a Board letter dated April 7, 2009, NNSA committed to complete the RPC overpacking effort by the end of June 2010. Over the next few weeks, LANL will complete radiography of the FSO container welds to verify adequacy. In addition, LANL is completing the FSO testing and qualification documentation for compliance with DOE M 441.1-1, *Nuclear Material Packaging Manual*.

This week, LANL also requested a revision to the Justification for Continued Operation (JCO) associated with the analysis and stabilization of miscellaneous vault water bath containers, which includes the RPC containers mentioned above and other miscellaneous ^{238}Pu -bearing containers. The revision addresses a RPC container that was identified in the vault water bath that had not been included in previous internal pressure calculations. The original JCO was submitted in May 2009 and since that time the majority of the non-safety class containers have been dispositioned by overpacking, repackaging or ensuring the containers are vented (inside glovebox lines). The JCO, which expires February 1, 2011, addresses the movement, handling, non-destructive assay, radiography, container opening and other incidental activities for non-safety class ^{238}Pu -bearing containers. The JCO also covers these activities for new containers receipts provided the approved internal pressure calculation indicates the containers have a usable lifetime that exceeds the JCO expiration.

Chemistry and Metallurgy Research (CMR) Building: LANL has now completed packaging approximately 40 grams of non-dispersible ^{244}Cm into appropriate containers that will be shipped to Area G to await ultimate disposition. Removal of this material represents a significant reduction in material-at-risk located at the CMR facility. Facility personnel also continue actions to restart the alpha box located in the Wing 9 hot cells for repackaging six dispersible ^{233}U and ^{237}Np items that are located in the floor wells. Facility preparation and readiness actions to use the alpha box are expected to be complete within the next two months to allow the repackaging campaign to be done by the end of September.

Weapons Engineering Tritium Facility (WETF): WETF personnel continued actions this week to close pre-start findings and develop corrective action plans for post-start findings associated with the contractor Operational Readiness Review (ORR). The NNSA ORR is scheduled to begin on Monday.

Transuranic Waste Facility (TRUWF) Project: This week, the site office provided comments to LANL on the TRUWF preliminary hazard analysis and the conceptual safety design report. The site office plans to issue a conceptual safety validation report in the near future. The Technical Independent Project Review for this project is scheduled for mid-July.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 25, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 25, 2010

Plutonium Facility – Safety Basis: This week, LANL re-submitted the 2009 annual update of the Documented Safety Analysis (DSA) and Technical Safety Requirements (TSRs) for the Plutonium Facility to the site office for approval. The DSA includes updated analysis of the seismic accident scenarios (both the seismically induced fire and spill events). Consistent with the previous submittal, LANL disaggregated the material-at-risk into the various physical forms (e.g., metal, oxide, solutions) with specific administrative controls for each form. In addition, this submittal includes further refinement of the different forms of heat source plutonium materials (e.g., fine powder, sintered) and the potential amount of molten plutonium that could be involved in the seismic accident scenarios. Based on the revised analysis, the offsite dose consequence for the postulated post-seismic fire scenario is significantly lower than the dose consequence in the DSA approved in 2008. However, the mitigated consequence remains above the DOE evaluation guideline (site rep weekly 12/4/10).

For the DSA and TSRs approved in 2008, LANL is currently conducting an Implementation Verification Review for the fourth and final phase of implementation. Last week, LANL also submitted a revision to the 2008 DSA/TSRs to resolve previous site office comments and conditions of approval. The submittal includes the following requirements for declaring a TSR violation for a design feature: 1) failure to perform an In-Service Inspection (ISI) within the required frequency is a TSR violation 2) if a design feature fails an ISI, that failure is new information, which shall be evaluated for initiation of the Potential Inadequacy of the Safety Analysis process (failure of an ISI is not automatically considered a TSR violation) 3) failure of a design feature to meet performance criteria, functional requirements, or safety function following return to service after planned or inadvertent modification is a TSR violation.

Weapons Engineering Tritium Facility (WETF): On Monday, the NNSA Operational Readiness Review (ORR) team began their review to evaluate resumption of tritium gas handling operations. This week, NNSA ORR field observations including conduct of an emergency drill were performed. The team plans to complete their review and provide recommendations and findings by next Wednesday. Following the initial restart of low pressure tritium gas handling operations, which is the scope of the ORR, LANL plans to perform a contractor readiness assessment in July to restart function test operations to support an important programmatic mission.

Plutonium Facility – Fire Suppression System: In September 2009, LANL declared the fire suppression system inoperable based on hydraulic calculations that indicate the system does not achieve the water density coverage required in the safety basis. A Justification for Continued Operation (JCO) including compensatory measures was approved and implemented while upgrades to resolve the flow density issue were completed. This week, LANL requested an extension to this JCO to September 17th (the previous JCO expires at the end of June) to allow completion of upgrades to resolve this issue.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 2, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 2, 2010

Weapons Engineering Tritium Facility (WETF) – Readiness: This week, the NNSA Operational Readiness Review (ORR) team completed their review and recommended to the startup authority (NNSA site office manager) that WETF be authorized to restart tritium gas handling operations following closure of pre-start findings and approval of corrective action plans for post-start findings. The team identified six pre-start findings and ten post-start findings (including two post-start findings associated with the site office). The team noted that the lack of a defined process to evaluate gaps in safety management programs and identify corresponding compensatory measures complicated the readiness review. The team also observed that there appeared to be weaknesses in both LANL and site office activities to demonstrate and verify readiness prior to the ORR. The ORR team also recommended that an integrated plan for overall startup (i.e., beyond the first phase of operations reviewed by the ORR) that is linked to safety basis and formality of operations improvements will help support future startup activities.

Weapons Engineering Tritium Facility – Safety Basis: This week, facility management declared a potential inadequacy of the safety analysis based on the discovery that safety significant tritium vessel storage racks could not perform their credited safety function. During a facility walkdown, an ORR team member identified that metal retaining plates used to position and secure tritium vessels in the storage racks were not mechanically fastened to the rack assembly. Original design calculations used to demonstrate the storage racks would meet required performance category (PC)-2 seismic criteria assumed the retaining plates were securely connected to the rack assembly. Without this secure connection, the racks cannot perform their seismic safety function.

In late 2009, an updated analysis of the seismic capacity of these storage racks performed in support of the Seismic Analysis of Facilities and Evaluation of Risk (SAFER) project also concluded that the racks could meet PC-2 criteria. Although current system drawings reflect a lack of connection between the retaining plates and the rack assembly, the SAFER evaluation used the original design calculation that assumes this connection as a key input. As a result, the conclusions of the SAFER evaluation suffer from the same faulty assumption found in the original calculation.

Radioactive Liquid Waste Treatment Facility (RLWTF): This week, the assessment lead outbriefed preliminary results from a Facility Centered Assessment (FCA) of the RLWTF. Unlike previous FCAs, this review was chartered at the Responsible Associate Director (AD) level rather than at the Laboratory Director level. The review was shadowed by representatives of the DOE's Office of Health, Safety and Security (HS-64) and the NNSA site office. Overall, the assessment team concluded that within the last year RLWTF has become the most improved and best operationally managed facility at LANL. This conclusion underscores the effectiveness of management restructuring and leadership changes at RLWTF, including a shift in AD and Facility Operations Director ownership and the addition of a highly experienced Operations Manager. It will be critical to sustain this high level of operational performance as the anticipated operating lifetime of the existing RLWTF continues to grow due to delays in the RLWTF-UP project.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 9, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 9, 2010

Federal Oversight: This week, Don Winchell, NNSA Los Alamos Site Office manager, retired from federal service. NNSA has announced that Kevin Smith will replace Winchell as the site office manager. Roger Snyder, deputy site office manager, will serve as the acting manager until Smith reports for duty in late August. In the interim, NNSA headquarters has delegated safety basis approval authority to Snyder, but has retained startup and restart authorization authority at the NA-10 level.

Plutonium Facility: On Thursday, Plutonium Facility management declared a potential inadequacy of the safety analysis (PISA) and initiated a hazardous material response based on the discovery of potentially explosive ammonium nitrate powder inside the facility.

For years, facility personnel had observed a white powdery substance being generated and accumulating between the first and second stages of high efficiency particulate air (HEPA) filters in the standby glovebox exhaust filter plenum that services the 200 Area of the facility. White powder has never been observed in any other Plutonium Facility HEPA filter plenum, including the primary 200 Area glovebox exhaust plenum. The powder was thought to be an inert oxalate salt and was considered benign. Two weeks ago, more thorough chemical analysis performed to support dispositioning several bags of this powder as waste concluded that the substance was actually 95% ammonium nitrate. Upon receipt of the analysis results, facility and safety basis personnel believed the ammonium nitrate to be a strong oxidizer and entered the New Information process to determine whether the unexpected presence of a strong oxidizer in a credited HEPA filter plenum was an unanalyzed hazard that represented a PISA. On Thursday, as part of processing this New Information, safety basis personnel consulted LANL explosives experts who judged that the ammonium nitrate should be considered a UN Class 1.1 explosive based on qualitative description of the powder. This prompted a PISA and a number of immediate actions.

A hazardous material response to recover and neutralize several bags of previously collected ammonium nitrate powder from the facility basement was initiated on Thursday and successfully completed on Friday. Access to the basement room containing the affected HEPA filter plenum, where powder continues to be generated, has been secured and controlled. A waste box in the basement containing removed HEPA filters believed to be contaminated with ammonium nitrate powder has also been isolated and handling of this box has been prohibited. Until the generation mechanism of the potentially explosive powder is better understood, facility management has suspended all aqueous processing activities in the 200 Area of the Plutonium Facility.

Weapons Engineering Tritium Facility (WETF): Prior to retirement, the NNSA site office manager authorized restart of certain tritium gas handling and transfer operations after pre-start findings from the recently completed Operational Readiness Review were confirmed to be closed by site office personnel. An additional contractor readiness assessment is scheduled for late July to authorize function tester operations required for an important programmatic deliverable.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 16, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 16, 2010

Andersen, Caleca, Hadjian, Kimball and Porter were onsite this week to discuss ongoing seismic and structural analyses for the Chemistry and Metallurgy Research Replacement Project.

Transuranic Waste Facility (TRUWF) Project: This week, a team sponsored by the NNSA Office of Project Management and Systems Support (NA-54) conducted an Independent Project Review (IPR) to support a request for Critical Decision-1 for the TRUWF Project. The IPR scope included evaluation of nuclear safety, safety basis, and risk management. The team intends to have a draft report prepared next week.

In advance of the IPR, the NNSA site office issued a Conceptual Safety Validation Report (CSVR) approving the TRUWF project's Conceptual Safety Design Report. In the CSVR, the site office states that its review identified two issues that could affect the ability of the project to proceed. One issue relates to a lack of effective controls to mitigate public and collocated worker consequences for a postulated aircraft crash scenario. The other issue deals with the use of non-conservative analytical assumptions for a seismic impact scenario and the potential for the seismic design category of TRUWF building structures to change if conservative assumptions are used.

The CSVR asserts that more refined analysis is needed to support dose calculations and to provide a basis for the selection of controls, but concludes that the project should be capable of proceeding to the next stage of design if these issues are addressed in a timely manner. To prompt timely resolution, the site office issued formal conditions of approval to address concerns with the aircraft crash scenario within 30 days and to re-evaluate the seismic impact scenario within 90 days.

Transuranic Waste Operations: In late June, LANL management submitted a new Basis for Interim Operations (BIO) for transuranic waste operations at Area G to the NNSA site office for review and approval. The existing Area G BIO was approved in 2003. The new BIO identifies four postulated accident scenarios (fuel pool fire from container leak, aircraft crash, wildland fire and seismically-induced fire) where effective safety class controls cannot be credited to mitigate offsite dose consequences to below the DOE Evaluation Guideline. The proposed BIO credits three engineered controls (safety class vehicle barrier systems at high-risk locations and safety significant transuranic waste drums and drum venting system) and eighteen specific administrative controls to prevent or mitigate postulated accidents.

Plutonium Facility: LANL personnel recently completed the fourth and penultimate Independent Verification Review (IVR) of Technical Safety Requirements associated with the 2008 Plutonium Facility DSA. The scope of the IVR included TSR controls related to the vault water bath, glovebox support stands, laboratory room and glovebox transient combustible loading, and special nuclear material containers. The review identified five pre-implementation findings. This IVR was also initially intended to verify implementation of important new material at risk (MAR) controls. However, due to delays associated with the newly developed MAR Tracker software used to implement these controls, verification of MAR TSRs will be deferred to the final IVR.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 23, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 23, 2010

Mr. Broderick was out of the office this week.

Radioactive Liquid Waste: This week, the site office issued direction to LANL on maintaining an enduring radioactive liquid waste processing capability. The Radioactive Liquid Waste Treatment Facility – Upgrade Project (RLWTF-UP), which is over 90% complete with design, was intended to replace the existing aging facility and provide capability for both transuranic and low level liquid waste processing. However, NNSA has concluded that the escalating project cost (currently estimated at approximately \$350M versus previous estimates of approximately \$100M) combined with out-year funding challenges (given other high priority projects) require NNSA to evaluate and pursue other alternatives. Therefore, the site office has directed LANL to 1) provide a recommendation for the most cost effective and efficient way to ramp down on the current RLWTF-UP design activities and 2) evaluate options to provide an enduring radioactive liquid waste capability (including upgrade and use of existing facilities and smaller scope new facilities). The site office requested a final recommendation on a preferred option within eight weeks.

Chemistry and Metallurgy Research Replacement (CMRR) Project: The Integrated Design Coordination Meeting for the CMRR project was conducted in Los Alamos this week and included representatives from NNSA, LANL and project subcontractors. For the CMRR Nuclear Facility, the project is completing the closure of issues identified in the Technical Independent Project Review that was conducted late last year. The CMRR Nuclear Facility final design contracts are expected to be awarded in October.

Plutonium Facility – Unreviewed Safety Question: This week, LANL concluded that the presence of potentially explosive ammonium nitrate powder identified on high efficiency particulate air (HEPA) filters represents an Unreviewed Safety Question. Previous actions to place the facility in a safe configuration remain in effect (e.g., aqueous operations the 200 area suspended and controlled access to the HEPA plenum room). LANL continues to investigate the source of the ammonium nitrate powder with samples from the in-service HEPA filters collected this week (site rep report 7/9/10).

Weapons Engineering Tritium Facility (WETF): LANL continues to pursue startup preparations for the function test capability at WETF. A management self assessment is scheduled to begin next week followed by a contractor readiness assessment planned for August 9th.

Plutonium Facility – Safety Basis: As noted last week, Plutonium Facility personnel are on the final phase of implementing the Documented Safety Analysis that was approved in December 2008. LANL recently requested an extension for completing this activity to October (previously scheduled to be complete in August). The extension is required to allow completion of fire suppression system modifications and implementation of the material-at-risk tracking system.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 30, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 30, 2010

Transuranic Waste Facility Project: This week, LANL responded to an NNSA site office condition of approval (COA) identified in the Conceptual Safety Validation Report that requested re-evaluation of the aircraft crash accident scenario. In particular, the COA requested LANL to provide documentation that the frequency of occurrence for this postulated accident is below the screening threshold of $1e-6$ per year or that consequence of an aircraft crash can be mitigated to a level that does not challenge the DOE evaluation guideline. LANL has decided to relocate the facility from Technical Area (TA)-52 to the adjacent TA-63 to increase standoff distance from the airport thus reducing the likelihood of an aircraft crash to less than $1e-6$ per year per DOE-STD-3014. Currently, Critical Decision-1, *Approve Alternative Selection and Cost Range*, is planned for mid-August. LANL also plans to conduct value engineering studies next month, in part, to resolve a site office COA on the adequacy of the seismic accident analysis.

Radioactive Liquid Waste Treatment Facility: Last week, LANL began the deinventory efforts for the sludge settling tank (TK-7) previously associated with Room 60/60A transuranic (TRU) liquid waste processing. TK-7 has a known leak site that required urgent action in 2008 to reduce the sludge level below the leak site. As part of Room 60/60A TRU processing equipment upgrades, a new sludge settling tank (TK-7A) was installed and has been used since TRU processing resumed in late-2009. However, a legacy heel of TRU sludge containing approximately seven Am-equivalent Ci remained in TK-7. LANL's plans to remove this sludge involve the potential for multiple phases. The first phase that began last week involves transferring sludge to TK-7A using the existing pumps and piping that historically removed sludge from the tank. However, given the state of the sludge and lack of in-tank mixing capability, LANL anticipated that this technique may not be capable of removing all legacy sludge. Therefore, a second phase was planned that would involve opening a port on top of the containment tank to insert temporary suction piping to establish a new transfer path to mobilize and remove residual sludge. As of Friday, LANL has removed approximately 75% of the sludge using the initial technique but expected to have to move to the second phase as early as next week to complete removal.

Transuranic Waste Operations: Earlier this month, the NNSA site office approved a page change to the Area G TSRs that authorizes open-drum sort, segregate, size reduction and repackaging (SSSR) operations involving up to 2.5 combustible equivalent Ci. Similar open-drum operations have been conducted at Area G for some time at the less than hazard category 3 level (i.e. less than 0.52 Pu-equivalent Ci) in the Dome 231 Permacon and inside a containment tent in Building 412. The page change increasing the MAR limit associated with SSSR operations allows a greater population of drums to be processed to achieve compliance with the Waste Isolation Pilot Plant (WIPP) waste acceptance criteria, allowing offsite shipment. New TSR-level controls establish a limit of 5 SSSR processing areas at Area G and set thermal separation distances between SSSR areas and staged waste containers. NNSA also issued a COA requiring establishment of TSR-level flammable liquid controls in SSSR areas. A contractor readiness assessment will be performed prior to beginning 2.5 combustible equivalent Ci SSSR operations at

Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 6, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 6, 2010

Plutonium Facility – Criticality Safety: This week, Plutonium Facility management identified that an activity conducted last month in a drop box was not analyzed or approved by the criticality safety group. Drop boxes are used for pass through of materials from the trolley line to gloveboxes; however, operations, especially related to waste processing, are analyzed and allowed in many of these boxes. In this case, a dry residue material was identified as waste and was being repackaged for disposition. Operators moved the material to the drop box and then repackaged and weighed the material believing they were in compliance with the criticality safety evaluation and posting that allowed waste operations. The first line manager became aware this week that the operation had been conducted in the drop box and contacted the criticality safety group. The criticality safety group concluded that the dry residue operation was not analyzed and a Level 1 non-compliance criticality safety infraction was declared. During the critique of this event, facility management became concerned that there may be a misunderstanding of what operations are allowed in drop boxes. As a result, all drop box operations were paused and a deliberate review and resumption process developed involving conduct of operations mentors and criticality safety.

This infraction highlights the importance of precise communications in defining activity scope and safety requirements. Over the last several months, there have been a number of criticality safety issues identified at the Plutonium Facility. Management has taken several actions to address these issues including stationing two members of the criticality safety group at the Plutonium Facility to observe and walkdown process operations. Plutonium Facility management will also conduct a briefing next week for all facility first line managers to discuss criticality safety issues.

Chemistry and Metallurgy Research Building (CMR): A number of high dose rate materials including Cm-244, Am-241, Np-237, and U-233 have historically been stored in heavily shielded floor wells in CMR's Wing 9. CMR personnel are aggressively working to disposition this material to reduce facility risk and to achieve compliance with new material at risk (MAR) limits in the approved CMR DSA that is required to be implemented before the end of December 2010.

Ten Cm-244 items account for nearly 99% of the MAR associated with the remaining material from the floor wells. These items have been retrieved from their floor well locations, transferred to Wing 9 hot cells and packaged into Type A shielded pipe overpack containers awaiting shipment out of CMR as waste. However, the ultimate disposition path for this material is currently in flux based on a request by the DOE Office of Fuel Cycle Technologies (NE-5) to provide interim staging of the curium items until April 30, 2011, to support possible programmatic reuse of this material. As a result, LANL management is investigating onsite and offsite options to provide interim storage outside of CMR where the 40 kg of MAR represented by the ten curium items would exceed the new DSA total facility MAR limit by almost a factor of 3.

Several remaining floor well materials contain Np-237 and U-233 in dispersible oxide forms that require repackaging prior to disposition. CMR personnel have restored the operability of an alpha box confinement system inside a hot cell to support dispersible material repackaging operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 13, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 13, 2010

Waste Operations: On Monday, LANL declared an Operational Emergency due to the potential release of red fuming nitric acid. Workers in Area L were in the process of over-packing three legacy containers for offsite disposition. After placing the third container into the overpack, workers noted fumes being released. The overpack container was latched closed and relocated to a spill pallet. The workers then contacted the operations center and protective actions were initiated (i.e., local evacuation and shelter in-place) along with contacting the emergency response organization. The overpack container subsequently ruptured and additional material was released. Emergency response personnel established an incident command for the event and the emergency operations center was manned. A re-entry and recovery plan was developed to stabilize the container and material. Hazardous material personnel performed multiple entries to place the area in a stable condition (the material was neutralized and repackaged into other containers). LANL plans to perform an investigation to identify opportunities for improvement and lessons learned from this event.

Criticality Safety: This week, Plutonium Facility personnel identified several additional criticality safety infractions where operations or activities were not consistent with criticality safety evaluations. These new discoveries were prompted by a significant effort on the part of facility management to refocus attention on criticality safety compliance in light of a string of recent issues. Senior management held a meeting with all first-line Plutonium Facility managers on Monday to discuss lessons learned from recent criticality safety infractions and to reinforce the importance of understanding and complying with criticality safety limits. The meeting also emphasized the need to pause operations if actual work activities depart from those analyzed in criticality safety evaluations or if there is ambiguity in the intent of criticality safety limits.

This week, the institutional Nuclear Criticality Safety Committee (NCSC) began a review at CMR to assess the facility's implementation of the LANL criticality safety program. The NCSC plans to conduct a similar review assessing implementation at the Plutonium Facility.

Transuranic Waste Operations: Operations to vent and filter sealed transuranic waste drums at Area G have been suspended since a hydrogen deflagration event occurred in November 2008. Several thousand legacy waste drums generated and stored at Area G require venting prior to offsite disposal at the Waste Isolation Pilot Plant. To improve the safety of drum venting operations required to support Area G closure, LANL has installed a new engineered drum venting system that is better equipped to mitigate the effects of a deflagration if one should occur. The NNSA site office is currently reviewing proposed revisions to the Area G TSRs to support resumption of drum venting operations using the new system. Area G personnel must also successfully complete a contractor readiness assessment prior to resuming drum venting operations (site rep weeklies 3/13/09, 11/28/08).

Transuranic Waste Facility (TRUWF) Project: Following an Energy Systems Acquisition Advisory Board review, the TRUWF Project received approval of Critical Decision-1, *Approve Alternative Selection and Cost Range*. LANL plans to perform value engineering studies later this month to evaluate parameters used in the safety analysis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 20, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 20, 2010

On Wednesday, staff members Pasko and Shuffler conducted a telephone conference call with LASO and LANL personnel to discuss the results of a recent review of the Chemistry and Metallurgy Research Building Documented Safety Analysis and plans for post-2010 operations.

Transuranic Waste Operations: This week, LANL began their contractor readiness assessment for open drum debris sorting operations with up to 2.5 combustible equivalent Ci in Area G. The review team is evaluating operations in both the Dome 231 Permacon and inside a containment tent in Building 412. This review is expected to be complete next week (site rep report 7/30/10).

Weapons Engineering Tritium Facility (WETF): LANL completed a management self assessment of function test operations at WETF this week. The team recommended that the activity proceed to a contractor readiness assessment following root cause determination and corrective action closure of pre-start findings. The team identified seven pre-start findings including issues with emergency management response (concerns with emergency response were identified during the NNSA operational readiness review for phase I operations). WETF personnel are working on closure of these findings and plan to begin the contractor readiness assessment on Monday.

Fire Protection Program: This week, NNSA completed a review of the LANL fire protection program with focus on overall program, fire hazard analyses, self-assessments, integration of fire protection with facility projects and fire department response and capabilities. The preliminary outbrief by the team noted a number of findings including issues with training and qualification of the fire protection staff, implementation of the fire system impairment program and self assessments. A final report for this review is expected in the next few weeks.

Plutonium Facility – Unreviewed Safety Question: As noted on July 23rd, LANL had declared an unreviewed safety question based on the presence of potentially explosive ammonium nitrate powder identified on high efficiency particulate air (HEPA) filters in a 200 area plenum. This week, sample analysis concluded that material found in a 400 area HEPA plenum is also ammonium nitrate. Based on these results, similar compensatory measures have been implemented in the 400 area (e.g., suspension of aqueous operations). Last week, LANL prepared an Evaluation of the Safety of the Situation (ESS) based on the information available concerning the ammonium nitrate in the 200 area plenum. The ESS noted that the material would not begin to approach an explosive hazard until one-half inch had accumulated (based on explosive expert evaluation). Further, the ESS identified that material accumulation was occurring very slowly. LANL proposed monitoring the material as part of the TSR Hazardous Material Protection Program and taking corrective actions if material reached one-quarter inch. Based on the results for the 400 area, LANL is revising the ESS to address the 400 area activities (site rep report 7/9/10 and 7/23/10).

Waste Operations: LANL has formed an investigation team to evaluate the Area L event involving red fuming nitric acid that occurred last week. The team will establish the event timeline, determine how the event occurred and identify recommendations for LANL management. The investigation is expected to be complete in early-September (site rep report 8/13/10).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 27, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 27, 2010

Waste Operations: This week, LANL identified that waste retrieved and stored in a container inside enclosure 1 at Material Disposition Area-B (MDA-B) exceeds the material-at-risk (MAR) limits for a radiological facility. The container (20 cubic yard capacity) is estimated to contain approximately 3 Ci Pu-239 equivalent, which is above the hazard category 3 threshold of 0.52 Ci for Pu-239. Facility personnel suspended waste operations at MDA-B and placed the facility in a safe and stable condition. LANL is performing waste retrieval and disposition operations at MDA-B as part of the American Recovery and Reinvestment Act activities at the laboratory. MDA-B was used to bury process waste from nuclear weapon and science activities in the mid to late-1940s. Previous characterization data indicated that the activity could be performed under the MAR limits for a radiological facility.

On Tuesday, MDA-B personnel completed the loading of the waste container in enclosure 1. Items retrieved during this operation included a pipe component (approximately 8" diameter, 2.5' length) that was noted to be highly contaminated. Field sample analysis of the waste in the container performed at that time indicated that the material retrieved had significantly higher MAR than expected. Subsequent sample analysis confirmed that approximately 3 Ci Pu-239 is present in the container. LANL is currently evaluating options to address the material. MDA-B retrieval operations remain suspended pending resolution of this issue.

Chemistry and Metallurgy Research Building (CMR): The site office directed LANL this week to move 10 curium-244 items (approximately 40 grams) from CMR to Area G for storage in a secured transportainer. These items had been stored in the Wing 9 floor wells but were recently repackaged into Type A shielded pipe overpack containers. LANL plans to store these items in Area G pending determination of whether a programmatic need exists. Removal of the curium-244 results in approximately 40 kg Pu-239 equivalent reduction in material-at-risk at CMR.

As part of the implementation plans for the recently approved Documented Safety Analysis (DSA) at CMR, LANL has been conducting in-service inspections of safety design features. While conducting these inspections this week, LANL noted deficiencies in several gloveboxes and in one hot cell that could prevent these design features from performing their safety function. The facility gloveboxes and the hot cells are credited as safety design features in both the current safety basis and the new DSA. LANL concluded that these issues represent a Potential Inadequacy in the Safety Analysis.

Weapons Engineering Tritium Facility (WETF): The contractor readiness assessment team completed their evaluation of function test operations at WETF this week and provided feedback to LANL and LASO management. The team identified six pre-start and four post-start findings. The review team recommends that the startup authority approve restart of this operation following satisfactory closure of the pre-start findings.

Transuranic Waste Operations: This week, LANL completed the contractor readiness assessment for open drum debris waste sorting operations at Area G. Two pre-start findings, both associated with training, and four post-start findings were identified by the review team. This team recommends

approval to start operations following closure of the identified pre-start findings.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 3, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 3, 2010

Transuranic Waste Operations: Last week, the NNSA site office approved an activity at Area G involving the receipt, handling and storage of a shielded box containing approximately 0.5 g of Am-241. The box is currently staged at Sandia National Laboratories – Albuquerque (SNL-Albuquerque) and contains a legacy americium source that originated at the Lovelace Respiratory Research Institute. The material is thought to be in a dispersible form based on radiation protection alarms received during a previous attempt to open the shielded box. The box will be placed in robust Type B shipping cask at SNL-Albuquerque, transported to LANL, received at Area G, transferred from the cask to a Type A standard waste box, and staged in the Type A overpack in an Area G waste storage dome. Plans for retrieval and ultimate disposition of the americium are under development and will be reviewed and approved separately.

NNSA approval was required to support receipt, handling and staging of this item because LANL personnel performed an unreviewed safety question (USQ) evaluation against the Area G safety basis that resulted in a positive determination. The process step where the shielded box is removed from the Type B shipping cask and transferred to the Type A standard waste box caused the positive USQ. The Area G safety basis assumes transuranic waste at Area G is packaged in Type A containers of sound integrity. Since the shielded box is not a certified Type A container, this activity was assessed to increase the probability of an accident above the level evaluated in the safety basis.

Chemistry and Metallurgy Research Building (CMR): Facility personnel are in the process of implementing the Technical Safety Requirements (TSRs) associated with the Documented Safety Analysis that was approved by the NNSA site office in June 2010. One important improvement in the recently approved safety basis relates to the treatment of passive engineered controls that have been credited in the TSR document as Design Features. In the current safety basis, no periodic inspections or surveillances are prescribed to confirm that these safety class and safety significant Design Features continue to effectively perform their credited nuclear safety functions. Although the Department of Energy's hierarchy of controls gives preference to engineered over administrative controls and passive over active controls, DOE Directives do not require periodic surveillances for passive engineered Design Features, whereas surveillances are required for active controls.

Though they are not required by DOE Directives, LANL personnel included periodic in-service inspections for credited Design Features in the new CMR safety basis, as a best practice. As reported last week, when CMR personnel performed the initial in-service inspections on facility Design Features, they discovered a number of deficiencies that rendered some gloveboxes and one hot cell structure unable to perform their credited safety functions. These deficient conditions had persisted under the current safety basis, at least in part, because the TSR document did not require inspections on an appropriate frequency to identify and address degradation or inappropriate modification of credited passive controls. These discoveries underscore the importance and utility of performing periodic inspections to ensure TSR-level Design Features continue to effectively perform their credited safety functions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 10, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 10, 2010

Waste Operations: On Friday, the site office approved an Evaluation of the Safety of the Situation (ESS) for Material Disposal Area-B (MDA-B) that was submitted by LANL to address waste in Enclosure 1. As noted on August 27th, LANL sample analysis of waste retrieved and staged in Enclosure 1 indicates that approximately 2.9 Ci of Pu-239 equivalent contaminated soil and debris is present in the container, which exceeds the 0.52 Ci limit for the MDA-B radiological facility. The path forward detailed in the ESS includes 1) placing a contaminated pipe component that was retrieved into a 55-gallon drum, 2) removing this component from MDA-B, 3) returning the remaining soil and debris to the MDA-B pit and, 4) covering the contaminated soil with at least 4 inches of overburden. The ESS notes that these actions will reduce the MAR below radiological levels and render the site safe and compliant with existing safety analysis. The site office response included a condition of approval that precludes additional excavation activities at MDA-B until a robust radioactive material monitoring system can be demonstrated including site office concurrence.

Plutonium Facility: Last week, LANL management submitted a revised ESS related to the discovery of potentially explosive ammonium nitrate in two safety class HEPA filter plena in the Plutonium Facility basement. The revised ESS includes a discussion of the mechanism thought to be generating the ammonium nitrate. Both affected plena abut closed front maintenance hoods which are separated by metal doors that do not create air-tight seals. The plena and maintenance hoods are connected to different portions of the ventilation systems. The maintenance hoods that abut the two affected plena share a ventilation flow path with Plutonium Facility restrooms that are cleaned using products that contain ammonia. The ESS postulates that ammonia from the restrooms is being drawn into the filter plena from the maintenance hoods through the unsealed door, where it then reacts with nitric acid vapors being exhausted from process gloveboxes. This generation mechanism would explain why ammonium nitrate is only being created between the first and second stages of credited HEPA filters in the affected plena. The ESS proposes two new compensatory measures. First, sealing the interface between the HEPA plena and maintenance hoods to prevent ammonia intrusion and second, prohibiting work with heat or ignition sources inside the basement rooms housing the affected plena. The ESS also seeks approval to resume aqueous nitrate operations in Plutonium Facility that have been suspended since the ammonium nitrate was discovered.

Chemistry and Metallurgy Research Building (CMR): On Thursday, LANL personnel transferred ten drums containing approximately 40 g of Cm-244 from CMR to Area G. The shipment was significant because this small quantity of curium translated into roughly 40 kg of Pu-equivalent MAR, an amount about five times greater than all other MAR in the facility combined. This material will reside at Area G in pipe overpack containers staged inside a metal transportainer until it can be transferred to another programmatic user or disposed as transuranic waste.

Transuranic Waste Operations: On Monday, LANL began an outage at the WCRR repackaging facility to accomplish a number of important maintenance and safety improvements including 1) installation of fire suppression capability in the repackaging glovebox, 2) relocation of the oil-filled transformer to greater than 25 feet from the facility and 3) resolution of seismic anchorage issues associated with the drum lift. The WCRR outage is expected to last until late-October.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 17, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 17, 2010

Staff member J. Pasko was onsite this week for Conduct of Operations training.

Weapons Engineering Tritium Facility (WETF): The startup authority for the WETF function test activity authorized operations last week following satisfactory closure of pre-start findings identified during the contractor readiness assessment. WETF personnel successfully completed the first and most programmatically critical of a series of planned function tests earlier this week. In addition to the function test campaign, WETF personnel are also pursuing risk reduction activities that include shipping excess material-at-risk to the Savannah River Site and providing more robust confinement for roughly 75 tritium-bearing vessels that may or are known to exceed their maximum allowable working pressure and are not currently protected by any credited confinement barrier.

Waste Operations: Following NNSA site office approval of the Evaluation of the Safety of the Situation (ESS), Material Disposal Area-B (MDA-B) personnel returned the contaminated soil located in Enclosure 1 to the pit and covered the material with a 4 inch minimum overburden. LANL personnel also packaged a contaminated pipe that had been retrieved in a Type A container and removed this item from MDA-B. These actions reduce the material-at-risk (MAR) at MDA-B below radiological facility levels (i.e. 0.52 Pu-239 equivalent Ci). The site office approval of the ESS included a condition of approval that precludes additional excavation activities until LANL can demonstrate a robust radioactive material monitoring system. On Friday, LANL submitted a path forward for real-time excavation monitoring to identify high activity material prior to removal from the excavation pit. A low energy gamma detection monitor will be attached to the excavation boom to identify the high MAR material. These materials will remain in the pit and be covered with at least a 4 inch overburden. LANL contends that the new monitoring system will allow safe excavation of soil and debris from MDA-B.

Plutonium Facility: This week, facility personnel submitted a revised ESS related to the presence of ammonium nitrate in safety class high efficiency particulate air (HEPA) filter plena. The revised ESS augments the set of compensatory measures that were proposed in the previous submittal to replace HEPA filters affected by ammonium nitrate generation (i.e second stage glovebox exhaust HEPA filters) prior to resuming aqueous nitrate processing operations. Replacing these filters and removing residual ammonium nitrate from filter plena housings will eliminate any potential explosive hazard this material may present (site rep weekly 9/10/11).

Chemistry and Metallurgy Research Building (CMR): This week, two CMR laboratory personnel discovered contamination on their booties during routine monitoring activities. A Radiological Control Technician responded, confirmed the presence of contamination and provided replacement booties. Room surveys identified up to 1 million dpm removable contamination in an area below an open front hood where one of the operators was working. Subsequent isotopic analysis indicated that the contamination was Pu-238. No Pu-238 analytical chemistry operations have been performed in this laboratory room in recent history. CMR personnel decontaminated the room and continue to investigate the source of contamination.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 24, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director

FROM: B.P. Broderick and R.T. Davis

SUBJECT: Los Alamos Report for Week Ending September 24, 2010

The site representatives were at DNFSB Headquarters in Washington, DC. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 1, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 1, 2010

Material Disposal Area (MDA)-B: Project personnel resumed excavation operations in all active enclosures, including Enclosure 1 where several weeks ago the material-at-risk (MAR) limit corresponding to the facility's less-than-hazard-category 3 status was exceeded. Prior to resuming excavation operations, LANL personnel implemented enhanced radioactive material detection capabilities to increase confidence that soil and debris involving higher levels of contamination can be identified and managed in compliance with the existing limit of 0.52 plutonium-equivalent (PE)-Ci for each excavation dig face.

Separately, LANL safety basis personnel are preparing a revised final facility hazard categorization, per DOE-STD-1027, that seeks to increase the less-than-hazard category 3 threshold from 0.52 PE-Ci to some larger value based on material dispersibility characteristics and energy sources associated with MDA-B.

Plutonium Facility – Fire Protection: Six fire-rated safes have been installed in the Plutonium Facility basement. These safes have been qualified to survive bounding Plutonium Facility accident scenarios and have been credited with a damage ratio of zero, meaning that material contained in these safes do not contribute to accident source terms.

LANL management has also submitted an evaluation documenting test results to support dramatically reducing the damage ratios of two types of special nuclear material storage containers commonly used in the Plutonium Facility. An outside laboratory performed furnace, open flame and drop tests on Conflat containers, often used to store plutonium metal, and a container sometimes referred to as an "espresso container," used to store Pu-238-enriched heat source plutonium. The tests used cerium oxide as a surrogate material for plutonium and containers were weighed before and after tests to determine how much material was released as a result of the test insult. The fraction of material released corresponds to the damage ratio of the container. Tests results indicate that both the Conflat and "espresso" containers have damage ratios very close to zero.

Plutonium Facility – Safety Basis: On Wednesday, LANL declared a Potential Inadequacy of the Safety Analysis (PISA) based on the use of non-conservative assumptions associated with calculation of dose conversion factors for plutonium chloride salts. Earlier this year, a PISA was identified at Hanford due to the use of Class-S (in accordance with ICRP-66) for plutonium materials subject to fire release scenarios. The Hanford PISA noted that the use of Class-S may not be conservative in all cases. Based on the information from Hanford, LANL safety basis engineers evaluated the assumptions used at LANL facilities and the Plutonium Facility in particular. Plutonium chloride salts are produced as part of pyrochemical metal production and purification processes used in the Plutonium Facility. For the Documented Safety Analysis approved in 2008 that is currently being implemented, the plutonium materials associated with certain pyrochemical processes are assumed to be molten plutonium metal that would oxidize during a fire with S-Class material type. LANL personnel concluded that the assumptions related to material class made in the safety basis may not be appropriately conservative in this case.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 8, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 8, 2010

Radioactive Liquid Waste: Last week, LANL provided an interim response to a July NNSA request to evaluate options for providing an enduring radioactive liquid waste capability. A joint NNSA/LANL strategy team evaluated options for sustainment/life extension of the existing capability and for providing a new capability. The team preliminarily assessed that it is not feasible or practical to provide a long-term capability with the existing Radioactive Liquid Waste Treatment Facility. However, the team also assessed that life extension upgrades to this facility could provide an interim capability for the next 10 to 20 years. For the enduring capability, the team identified and evaluated 37 separate options and proposed additional evaluation of two of these options. The first option involves updating mission requirements and reducing the scope of the current project plan. The second option involves some use of existing facilities along with separation of the processing capabilities (e.g., separation of low level and transuranic liquid waste processing). Progress on this study will be discussed during the upcoming Integrated Nuclear Planning workshop scheduled for early November. A final recommendation on the path forward for radioactive liquid waste capabilities is anticipated in late-December (site rep weekly 7/23/10).

Material Disposal Area (MDA)-B: On Tuesday, LANL submitted to the site office a revised Final Hazard Categorization for MDA-B that uses adjusted threshold quantities based on the specific materials and energy sources for the waste being retrieved. The LANL submittal would allow up to 5 plutonium-239 equivalent curies to be retrieved for the individual waste retrieval enclosures at MDA-B. The site office is currently reviewing the categorization to determine if the basis is adequate and whether it is compliant with DOE-STD-1027.

Plutonium Facility – Packaging: On Thursday, the site approved the final Safety Analysis Report for the Fuel Storage Outer (FSO) container in accordance with the requirements of DOE M441.1-1, *Nuclear Material Packaging Manual*. The FSO container is a welded safety class container that is used to robustly store plutonium-238 enriched materials at the Plutonium Facility.

Plutonium Facility – Evaluation of the Safety of the Situation (ESS): This week, the site office approved the ESS for the ammonium nitrate that was identified in the Plutonium Facility exhaust ventilation system. Following implementation of controls identified in the ESS (see site rep weeklies 9/10/10 and 9/17/10), LANL will be able to resume aqueous nitrate operations in the 200 and 400 areas.

Transuranic Waste Operations: LANL continues to pursue startup activities to allow venting of sealed transuranic waste drums at Area G. Drum venting activities have been suspended since a hydrogen deflagration event occurred in November 2008. A robust enclosure has been installed to improve the safety of this operation. This week, the site office approved Technical Safety Requirement page changes that cover drum venting operations. Currently, LANL plans to perform a laboratory readiness assessment prior to resumption of this operation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 15, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 15, 2010

Material Disposal Area (MDA)-B: This week, LANL personnel discovered that approximately 0.55 ²³⁹Pu-Equivalent Ci (PE-Ci) of material-at-risk (MAR) had been excavated from a retrieval pit and placed in a waste bin. This quantity of MAR exceeded the MDA-B MAR limit imposed to protect its designation as a less-than-Hazard Category 3 facility. In response, LANL management declared a potential inadequacy of the safety analysis and paused all excavation activity at MDA-B.

In late August, a similar MAR limit violation occurred at MDA-B. In response to the August event, excavation operations were suspended and the NNSA site office directed LANL to develop and implement enhanced radioactive material detection capabilities to provide higher confidence that important facility MAR limits could be protected via improved characterization of the quantity of MAR being unearthed during excavation. These new detection capabilities were in place this week and failed to prevent the MAR limit from being exceeded. Based on this recurrence, LANL senior management is evaluating options on how to resume and complete MDA-B environmental restoration activities in a compliant manner (site rep weeklies 10/8/10, 9/17/10, 9/10/10, 8/27/10).

Transuranic Waste Operations: Last Thursday, the LANL Associate Director for Nuclear and High Hazard Operations paused the conduct of a checklist contractor readiness assessment (CRA) required for startup of two heated transportainers at Area G based on the CRA team's discovery of several potentially significant safety basis-related findings.

Waste Isolation Pilot Plant (WIPP) waste acceptance criteria prohibit the presence of free liquids in transuranic waste drums. The heated transportainers are needed to ensure that any free liquids are in an unfrozen state prior to undergoing the radiographic characterization required by WIPP. The Area G safety basis restricts the aggregate amount of MAR allowed to be contained inside transportainers and within a 50 ft radius of their footprint. The CRA team found that the software program used by Area G to track inventory and ensure compliance with TSR MAR limits did not appear to effectively capture and account for MAR located inside a 50 ft radius of the heated transportainers. The CRA team also identified concerns related to the potential for hydrogen concentrations above the lower flammability limit to accumulate inside the heated transportainers. Area G engineering personnel had analyzed and ruled-out hydrogen deflagration hazards, but the CRA team found that key assumptions associated with transportainer drum loading and temperature from the engineering analysis had not been protected in operating procedures.

Plutonium Facility: This week, Plutonium Facility personnel recognized that sealed calibration standards containing ²³⁸Pu may present an over-pressurization hazard. There are more than 100 such standards in the Plutonium Facility and a smaller number of these standards in other LANL facilities. These standards were fabricated at the Mound Plant in the 1970's and documentation from that era indicates that the manufacturer only assured a five year safe operating life based on uncertainties related to material response to prolonged exposure to ²³⁸Pu. A great deal of relevant material response data now exists indicating that these sources are robust, but LANL is performing confirmatory analysis and is evaluating the situation through the New Information process.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 22, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 22, 2010

Material Disposal Area (MDA)-B: This week, NNSA Headquarters approved a request submitted by the Los Alamos Site Office to exempt MDA-B operations from the requirements of 10 Code of Federal Regulations (CFR) 830, Subpart B, *Safety Basis Requirements*. This exemption request was prompted by two recent events where quantities of material at risk (MAR) were excavated at MDA-B that exceeded the facility's MAR limit. These events undermined confidence that MDA-B operations could be conducted without unearthing levels of MAR that exceed the hazard category 3 threshold (0.52 ²³⁹Pu-Equivalent Ci) that invokes 10 CFR 830 requirements to develop and implement a Documented Safety Analysis and Technical Safety Requirements.

The site office request stated that an exemption is necessary for MDA-B environmental restoration activities to complete prior to the deadline imposed by Consent Order agreement with the state of New Mexico. The request also asserted that the exemption is justified because the engineered and administrative control set implemented under the MDA-B Facility Safety Plan is essentially the same suite of controls that were originally derived in a 10 CFR 830-compliant safety basis prepared and approved when MDA-B was considered a hazard category 3 facility. The exemption covers MDA-B operations involving MAR up to the hazard category 2 threshold quantity of 56 ²³⁹Pu-Equivalent Ci (PE-Ci), but requires formal response actions if MAR exceeds 5 PE-Ci.

Prior to LANL resuming operations at MDA-B, the NNSA site office must issue a letter affirming that the Facility Safety Plan and associated procedures have been adequately revised and implemented to comply with the terms and conditions specified in both the site office exemption request and the headquarters approval. NNSA has also directed LANL to submit any future changes to the Facility Safety Plan and associated procedures that affect the MDA-B safety envelop to the site office for concurrence before implementing the changes.

Chemistry and Metallurgy Research Building (CMR): To continue operating, CMR is required to implement its new DSA and TSRs prior to January 1, 2011, when the current CMR Basis for Interim Operations and interim TSRs expire. This week, after extensive work by facility personnel to implement the new safety basis, an independent LANL team began the formal Implementation Verification Review (IVR) that is required before CMR can officially transition to the new DSA and TSRs. The IVR team immediately noted a number of potential issues related to time-intensive TSR-level surveillance requirements that have not been performed prior to the review, but are scheduled to be performed prior to declaring that the new DSA and TSRs are implemented. The IVR team intends to complete their assessment on November 1st and issue a final report on November 12th (site rep weekly 6/4/10).

Readiness: DOE Order 425.1D, the most recent revision of the directive governing verification of readiness to startup or restart nuclear facilities, was formally incorporated into the LANL Management and Operating contract in late September. This week, LANL management submitted for NNSA site office review and approval a revision to the laboratory institutional procedure on readiness verification that reflects changes and new requirements from the revised Order.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 29, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 29, 2010

The staff held a teleconference with NNSA and LANL personnel to discuss the design of safety class seismically-actuated electrical shutoff devices planned for use in the Plutonium Facility. Pasko was also onsite to observe a joint NNSA/LANL workshop to discuss the strategy and actions needed to effectively control postulated seismic events at the Plutonium Facility.

Transuranic Waste Operations – Readiness: This week, the NNSA site office issued a memorandum approving LANL's most recent Startup Notification Report. In the approval memo, the NNSA site office manager directs a change to the level of readiness review required to authorize transuranic drum venting operations at Area G from a contractor readiness assessment to a federal readiness assessment. Transuranic waste drum venting operations have not been conducted at Area G since a hydrogen deflagration occurred during a venting evolution in late 2008. The new drum venting operation will be performed by a subcontractor using a new engineered venting system that will be operated under new TSR-level controls.

Material Disposal Area (MDA)-B: On Wednesday, during excavation activities inside Enclosure 12, MDA-B personnel identified two buried drums that were significantly degraded. While trying to extract the drums in accordance with procedures, one drum released approximately 5 gallons of a clear liquid. The enclosure has the capability to monitor for volatile organic compounds (VOCs) and these instruments indicated a significant increase in VOC levels inside the enclosure. Industrial hygiene monitoring external to the enclosure did not indicate a significant release of VOCs. However, construction workers in a nearby area external to the enclosure later complained of symptoms (all were evaluated and ultimately released with no medical restrictions). Enclosure 12 operations were suspended. LANL continues to evaluate this event to determine appropriate corrective actions.

Weapons Engineering Tritium Facility (WETF): Earlier this month, WETF personnel noted an increase in the oxygen concentration in a portion of the Tritium Waste Treatment System (TWTS). Subsequent investigation identified that a leak in the Hot Inlet System (HIS), which is part of the Tritium Gas Handling System (TGHS), was introducing oxygen into the TWTS. The HIS is used to analyze the composition of gas mixtures for tritium samples (less than 2g) and effluent from this system is normally sent to the TWTS. The TWTS was declared inoperable (which precludes tritium processing activities) while this issue was investigated. In addition, the HIS was declared inoperable and effluent was directed to the stack to prevent additional oxygen introduction to the TWTS.

Late last week, LANL declared a Potential Inadequacy of the Safety Analysis and subsequently declared a positive Unreviewed Safety Question based on the potential for oxygen in-leakage into the TGHS/TWTS that could potentially lead to a deflagration. On Thursday, LANL submitted to the site office an Evaluation of the Safety of the Situation and Justification for Continued Operation (JCO) to support resumption of tritium processing operations. Compensatory measures proposed by LANL in the JCO include the following: 1) monthly surveillance of two influent isolation valves when the HIS effluent is directed to the stack, and 2) the HIS shall be directed to the stack unless an operator is stationed to continuously monitor the TWTS oxygen concentration during the evolution. The site office is reviewing the JCO submittal.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 5, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 5, 2010

Plutonium Facility: Last Thursday, Plutonium Facility personnel lost control of radiological contamination during an operation to bagout material from a glovebox. The event occurred when one operator dropped a container to another waiting operator down an interface tube leading to the bagout port. When the container reached the second operator, the force caused his hand to pull down on the bagout assembly enough for the bag to detach from the glovebox port and breach the confinement boundary. Operators successfully re-secured the bag to the glovebox port with tape, and exited the area after continuous air monitors (CAMs) began alarming in their room. CAMs later alarmed in two adjacent rooms. The two operators and their attending Radiological Control Technician had contamination on their personal protective equipment and one operator had roughly 1100 dpm of alpha contamination on his skin. Nasal smears taken after all affected personnel doffed their respirators showed no detectable activity. This week, facility personnel performed a controlled re-entry to secure the bagged containers and decontaminate affected areas.

The design of the glovebox bagout port appeared to play a role in this event. Unlike most bagout ports found in the facility, this port lacks an engineered feature, such as a lip or raised nub, to help secure the bagout assembly to the port and prevent slipping. Also, this port included a long interface tube that required one operator to drop the container about 18 inches before it could be received and controlled by the other operator. Facility management has suspended all bagouts from gloveboxes with similar features until corrective actions can be developed and implemented.

Chemistry and Metallurgy Research (CMR) Building: A spill of greater than 5 gallons of contaminated liquid occurred in Wing 7 of CMR last Friday. There was no personnel contamination either during the spill or in subsequent cleanup activities. An analytical chemistry worker was disposing of approximately 2 liters of 2% concentrated nitric acid through the facility acid waste drain system. After pouring the acid into a hood drain, the worker opened a valve to the de-ionized water system to provide a flush of the acid drain line and exited the area. After the operator left the lab room, the acid drain line trap that connects to the hood drain separated and liquid from the trap and additional liquid from the de-ionized water system began to spill to the lab floor. The worker identified the spill upon return and contacted the Operations Center. The facility spill team was dispatched to the area to assess the spill and begin corrective actions. The emergency response organization was also contacted and responded to the facility. The de-ionized water was subsequently isolated and the spill was contained. During the event, the spill migrated to the basement and an uncontrolled lab corridor. Decontamination activities continued into this week. CMR personnel are developing corrective actions to reduce the likelihood of a similar event.

Plutonium Facility – Fire Suppression System: Last week, LANL requested site office approval to exit the Justification for Continued Operation (JCO) associated with deficiencies identified in the fire suppression system. The JCO was required because the system did not meet required flow densities in the most hydraulically remote 1500 ft² area. The request noted numerous improvements that have been made to this system including installation of additional risers (such that all areas have dual water sources) and relocation/installation of sprinklers to resolve coverage issues. The submittal also requests site office approval to use a 300 gpm hose stream allowance (500 gpm used previously). LANL notes that 300 gpm exceeds the NFPA 13 requirement (250 gpm) and is consistent with expected fire department response.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 12, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 12, 2010

Chemistry and Metallurgy Research Building (CMR): LANL management has submitted for NNSA site office review and concurrence a Safety Basis Strategy document that formalizes a new approach to controlling material-at-risk (MAR) at CMR. The new strategy would control MAR at a level that ensures offsite dose consequences for bounding postulated accident scenarios would not exceed the DOE Evaluation Guideline. To remain below the Evaluation Guideline, the total quantity of MAR allowed in CMR will be administratively controlled to a level 35% below the previously approved limit until the next annual safety basis update when the formal Technical Safety Requirement (TSR) MAR limit will be revised to capture the new approach. NNSA review of the Safety Basis Strategy is on-going.

CMR's two primary enduring missions involve performing programmatic analytical chemistry operations and recovering and dispositioning special nuclear material from a number of legacy confinement vessels. The most heavily loaded confinement vessels contain quantities of MAR that would consume a significant fraction of the total MAR allowed in the facility. Therefore, CMR will have to remove unneeded MAR, streamline transuranic waste disposition processes, and relocate to other facilities certain MAR-intensive operations in order to support processing these bounding confinement vessels without curtailing on-going analytical chemistry operations.

Weapons Engineering Tritium Facility (WETF): This week, WETF management declared a TSR violation associated with the Pressure Safety Program and a Potential Inadequacy of the Safety Analysis (PISA) related to internal fire barriers credited as part of the safety class facility structure Design Feature.

Management declared the TSR violation based on an issue identified by NNSA safety system oversight engineers. The TSR-level Pressure Safety Program requires post modification testing that involves leak testing at pressure conditions up to maximum operating pressure whenever a certain class of pressure-rated components are added to existing pressure systems. Roughly six assemblies containing this class of pressure-rated components were installed during the WETF restart effort, but were leak tested under vacuum conditions rather than the pressurized conditions required by the TSRs. In response to the TSR violation, WETF personnel will either perform required leak tests of the affected components, or produce documentation that these portions of the system had not leaked during use under pressure conditions equivalent to those required by the TSR-mandated tests.

The PISA was declared when two fire doors associated with fire barriers credited with a one hour fire rating were found to lack hardware required to ensure proper latching upon closure. Without latching hardware, the doors did not meet applicable National Fire Protection Association (NFPA) code requirements and represented noncompliant discontinuities in fire barriers credited to prevent fire propagation from one tritium storage or processing area to another. The discrepant condition was found during an in-service inspection (ISI) of the fire barriers by a fire protection engineer. The same ISI had been performed in the past but failed to identify the fire door deficiency, apparently because the inspection for this Design Feature assumed an adequate initial condition and only called for identification of degradation, wear, or unauthorized modifications. In response to the PISA, WETF management has instituted a fire watch for the affected areas when the facility is occupied and the application of door stops to maintain closure of the fire doors when the facility is unoccupied.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 19, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 19, 2010

Plutonium Facility: This week, Plutonium Facility management declared a potential inadequacy of the safety analysis (PISA) related to ^{238}Pu -enriched heat source plutonium (HS-Pu) items. This PISA involved the discovery of issues with several different classes of sealed HS-Pu items in the facility.

In mid-October, the Plutonium Facility cognizant system engineer for container systems identified a family of sealed HS-Pu items used as calibration standards that presented a potential over-pressurization concern. Although subsequent analysis demonstrated that pressures inside these standards would not exceed acceptable limits, an extent of condition review identified roughly 100 other sealed HS-Pu items that required evaluation for over-pressurization hazards. By this week, walkdown evaluations had discovered several sealed items that presented potential over-pressurization hazards, including one item that appeared to be slightly bulged. These discoveries prompted the PISA and immediate actions to place affected items in a safe configuration either by overpacking them in credited containers with a filtered vent or by introducing them into gloveboxes. LANL personnel are also taking action to evaluate the safety of several sealed HS-Pu calibration sources located at Area G and CMR.

In parallel with the walkdown evaluations of the roughly 100 suspect items, the cognizant system engineer was performing additional analysis on a type of encapsulated heat source that is credited as safety class in the Plutonium Facility DSA. This safety class encapsulated heat source is required to maintain confinement when subjected to the thermal insults associated with an evaluation basis facility fire. The new analysis indicates that units passed a certain age would not meet this performance criterion due to internal pressure increases associated with helium buildup from years of alpha decay. In response to this new information that is also covered under the PISA, facility personnel are locating units older than the threshold and ensuring they are appropriately overpacked (site rep weekly 10/15/10).

Readiness: Last week, the site office concurred with a revision to LANL procedure P115.0, *Verification of Readiness to Start Up or Restart LANL Nuclear Facilities, Activities, and Operations*. This revision incorporates the changes included in DOE Order 425.1D, which was added to the contract earlier this year. The site office provided six specific comments that will be incorporated into the procedure during the next update (within the next year). The NNSA site office plans to revise its startup procedure in the near future to align with the revised LANL procedure. Implementation of DOE Order 425.1D at LANL is required to be complete (including the revised site office procedure) by January 15, 2011. This week, representatives from NNSA Headquarters and the DOE Office of Health, Safety and Security were onsite to discuss LANL readiness and startup activities. Because of issues identified in this area (notably, the 2009 CDNS biennial review), compensatory measures were identified by NNSA Headquarters that require NA-17 to review and comment on readiness and startup decisions until a successful independent review is completed, either during the next CDNS biennial review or an independent follow-up review.

Chemistry and Metallurgy Research Building (CMR): The review team is finalizing the report documenting completion of the Implementation Verification Review for the new set of TSR controls that support post-2010 operation of CMR. The review identified eight pre-implementation findings and one post-implementation finding. Facility personnel have closed all but one pre-implementation finding.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 26, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 26, 2010

The laboratory was closed on Thursday and Friday in observance of the Thanksgiving holiday.

Plutonium Facility – Safety Basis: This week, facility management declared a TSR violation based on an NNSA Facility Representative discovery that a TSR-level surveillance to ensure compliance with material-at-risk limits had been performed without inspecting all required material locations.

Currently implemented Plutonium Facility TSRs require the quantity of ^{238}Pu -enriched heat source plutonium (HS-Pu) stored in each of the 60 locations in the vault water bath to be checked for compliance with approved limits on a quarterly basis. The limit on HS-Pu in vault water bath locations was derived to ensure the thermal loading from the total quantity of high-activity HS-Pu does not overwhelm the heat removal capability of the vault water bath leading to a rise in water temperature and eventual boiling. The NNSA Facility Representative discovered that the procedure used to execute the TSR-level surveillance only checked compliance in 51 of the required 60 locations in the vault water bath. The quarterly TSR surveillance had been performed five times using the inadequate procedure. This prompted Plutonium Facility management to declare a TSR violation.

In response to this discovery, facility personnel immediately checked the quantity of HS-Pu in the nine vault water bath locations that had been omitted by the surveillance procedure and each location was found to be in compliance with the TSR limit. The cause of the procedure inadequacy could not be immediately determined and continues to be investigated. Facility management identified corrective actions to strengthen expectations for verification and validation prior to procedure approval. Based on this and other discoveries of inadequate implementation of TSR-level surveillances and inspections, facility management is developing a plan to identify and address any similar issues. These implementation issues are also being evaluated to identify lessons learned that can be applied to the institutional Implementation Verification Review process that is intended to find and fix these issues.

Readiness: Recently, the site office provided conservative direction to LANL on the level of readiness review for startup activities identified in the FY 11 First Quarter Startup Notification Report (SNR). Because of the potential for substantial modifications, 15 planned startup activities at Area G, WETF and TA-55 were identified by the site office as potentially requiring federal Readiness Assessments in accordance with DOE Order 425.1D. The site office memo requests LANL to pursue project planning based on this direction. However, if LANL identifies additional information to indicate the startup activities do not involve substantial modifications, the laboratory should make appropriate recommendations in a future SNR revision.

For two startup activities, the site office memo directs that Operational Readiness Reviews be completed because of the hazards, complexity, and need to assess against all core requirements identified in DOE Order 425.1D. The first activity is startup of the Confinement Vessel Disposition Project in Wing 9 of the Chemistry and Metallurgy Building, which is scheduled for 2012. The second activity is the MOVER Project in Area G, which will conduct transuranic waste sort and segregate activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 3, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 3, 2010

This week, Board members Peter Winokur, Jessie Roberson, Joseph Bader, and John Mansfield were onsite along with staff members Timothy Dwyer, Matthew Moury, John Pasko and William Shields to meet with NNSA site office and LANL personnel.

Chemistry and Metallurgy Research Building (CMR): This week, the NNSA site office concurred with LANL's proposed safety basis strategy for CMR. NNSA's concurrence formalizes a new approach to managing and controlling material-at-risk (MAR) at CMR that ensures the DOE Evaluation Guideline will not be exceeded in bounding postulated accident scenarios. Under this new approach, CMR will administratively control MAR at a level approximately 35% less than the approved facility-wide limit. The Technical Safety Requirement (TSR) MAR limit will be changed to formally reflect the new approach in the next annual safety basis update.

CMR facility personnel are also nearing completion of their efforts to implement the DSA and TSRs that support post-2010 operations. Facility management is expected to declare implementation in mid-December and formally transition from the 1998 Basis for Interim Operations (BIO) and associated interim TSRs to the new modern DSA and TSRs.

Plutonium Facility: Historically, LANL tended to store low plutonium-content process residues in the vault rather than performing additional aqueous processing to recover and consolidate the special nuclear material. As a result of these legacy practices, roughly half of all items currently stored in the Plutonium Facility vault are residues. Additionally, greater than 1000 items or about 20% of the total vault holdings are items packaged in potentially vulnerable containers with taped slip-top lids rather than in robust safety-significant containers that include a HEPA-filtered vent. The presence of these slip-top containers requires respirator use whenever operators access the vault. In FY10, LANL made meaningful progress in addressing these legacy materials.

Last fiscal year, Plutonium Facility personnel robustly packaged or dispositioned almost 700 kg of plutonium-equivalent material. Of this 700 kg, about 25% was addressed using aqueous processing to recover plutonium (the significant ramp-up of aqueous processing was enabled by the restart of transuranic liquid waste processing capability in the Radioactive Liquid Waste Treatment Facility); approximately 40 % was shipped offsite or dispositioned as waste; almost 15% was repacked in robust containers; and another roughly 20% was packaged in welded 3013 containers.

Chemistry and Metallurgy Research Replacement (CMRR) Project: In September 2009, construction activities for the Radiological Laboratory/Utility/Office Building (RLUOB) were substantially completed. Since that time, LANL has been working to outfit laboratory and office space with necessary equipment. RLUOB is a radiological facility (limited to MAR less than 8.4g Pu-239 equivalent) that will provide approximately 19,500 ft² of laboratory space. RLUOB will also serve as a consolidated training facility, a centralized utilities and services building for the entire CMRR project (including the nuclear facility) and will accommodate 350 personnel. Turnover of office space is scheduled for October 2011 and radiological operations are planned for mid-2013.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 10, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 10, 2010

Safety Basis: Engineered controls credited in nuclear facility safety bases are implemented via Technical Safety Requirements (TSRs) as either Limiting Conditions for Operation or Design Features. In general, Limiting Conditions for Operation are used to implement active engineered controls and Design Features are used to implement passive engineered controls, regardless of functional classification. DOE Directives provide detailed requirements for Limiting Conditions for Operation, but provide few specific requirements for Design Features. In one example of this disparate treatment, DOE Directives provide guidance on what constitutes a TSR violation for Limiting Conditions for Operation but not for Design Features. This lack of specificity in requirements for Design Features appears to have contributed to variability in the treatment of Design Features across LANL's nuclear facilities.

The NNSA site office has taken action to drive a standard site-wide approach to Design Features as nuclear facility safety bases are updated. In the interim, the site office has issued supplementary direction describing when issues related to Design Features must be reported as TSR violations.

Transuranic Waste Operations – Area G: Last week, Area G personnel performed an in-service inspection for a TSR-level Design Feature on the last day of the required inspection period. Personnel completed the field portion of the inspection, which was found to be satisfactory, but could not formally complete the in-service inspection because a cognizant system engineer was not available to provide a required signature. As a result, the in-service inspection was not completed within the required time limit. The approved Area G TSRs provide criteria for declaring TSR violations associated with Limiting Conditions for Operation and Administrative Controls, but no criteria or requirements for declaring TSR violations for Design Features. However, based on the site office supplemental direction discussed above, facility management reported this failure to perform an in-service inspection within the required time limit as a TSR violation.

Transuranic Waste Operations – WCRR Repackaging Facility: This week, WCRR repackaging facility personnel were in the process of removing a 55 gallon drum from an 85 gallon overpack, when an operator noticed what appeared to be bulging of the vented 55 gallon drum. Operators immediately restored the lid to the 85 gallon overpack and all personnel evacuated the facility. Facility management called in a hazardous materials team from the LANL Emergency Response organization. The responders deployed a robot to enter the facility, remove the lid of the 85 gallon drum, and unscrew the vent on the 55 gallon drum to relieve any built-up pressure. Microphones mounted on the robot did not detect any acoustic evidence of overpressure relief and no CAM alarms activated after the vent was removed. Personnel ultimately made a controlled re-entry to the facility to survey for contamination and found none on the external surface of the affected drum or the surrounding area.

Today, the facility returned to normal operations and processed the affected 55 gallon drum. Inside, operators found a legacy 30 gallon drum that had been mostly reduced to powdery corrosion residue. This suggests that a highly reactive environment once existed inside the 55 gallon drum that may have caused the bulging noticed by WCRR operators.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 17, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 17, 2010

Staff members Caleca, Gibson, Hadjian, Kimball, Pasko and Shuffler were onsite this week to discuss the Chemistry and Metallurgy Research Replacement (CMRR) Project, walkdown the Plutonium Facility and to observe the peer review team meeting for the Plutonium Facility seismic evaluation.

Chemistry and Metallurgy Research Building (CMR): On Monday, CMR management declared implementation and began operating under the modern Documented Safety Analysis and Technical Safety Requirements that were approved by the NNSA site office in June. This action retires the 1998 Basis for Interim Operations, CMR's previous safety basis, which was set to expire on December 31, 2010. The new safety basis, in conjunction with a standing order that implements CMR's new policy for more tightly controlling material-at-risk (MAR), authorizes post-2010 operations using a quantity of MAR that ensures the DOE Evaluation Guideline will not be exceeded in bounding postulated accident scenarios.

Transuranic Waste Operations: This week, LANL resumed the readiness assessment for the startup of two heated transportainers at Area G. The heated transportainers are needed to ensure that any free liquids inside transuranic waste containers are in an unfrozen state prior to undergoing the radiographic characterization required by the Waste Isolation Pilot Plant waste acceptance criteria. In October, LANL started but then paused the review due to inadequate implementation of Technical Safety Requirements associated with tracking and limiting material-at-risk allowed inside the transportainers and within 50 feet. At the time, the review team also identified concerns related to the potential for hydrogen concentrations above the lower flammability limit to accumulate inside the heated transportainers.

These issues have now been resolved and the readiness assessment resumed on Thursday. Because of the work previously reviewed, the team expects to complete their review early next week.

Plutonium Facility: On Monday, the site office issued a letter to NNSA-Headquarters summarizing the completed near-term actions to reduce the probability and consequence of seismic accident scenarios. These actions included the following:

- Design of an automatic seismic shutdown of laboratory electrical equipment to reduce electrical ignition sources
- Removal or lock-out of glovebox ignition sources that are no longer needed
- Procurement and installation of six safes with adequate fire ratings to protect special nuclear material during a fire
- Testing of two container designs under fire conditions (testing completed supports a damage ratio of 1% for these containers)
- Establishment of project scoping for seismically upgrading the fire suppression system and key portions of the active confinement ventilation system
- Repair of deficiencies in the main Plutonium Facility fire barrier
- Robustly package or disposition special nuclear material (almost 700 kg Pu-239 equivalent was repackaged or dispositioned in FY 2010)

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 24, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 24, 2010

Transuranic Waste Operations: Thirty-one legacy confinement vessels that contain residual quantities of radiological material are staged on an outdoor asphalt pad at Area G. Late last week during a walkdown of the area, an NNSA Facility Representative noticed a number of vessel showed signs of possible degradation. Radiological surveys performed this week found external contamination on six of the thirty-one vessels (maximum of 17,000 dpm alpha) and on the ground beneath one of the vessels (900 dpm alpha). No routine contamination monitoring had been performed on these vessels, but they were subject to a quarterly TSR-level in-service inspection to identify leaks, corrosion, or damage. The latest quarterly inspection was completed and noted as satisfactory on the same day the Facility Representative raised concerns about vessel integrity.

In response to this discovery, facility personnel decontaminated the six affected vessels and applied tape to seal flanged ports that offer a potential leak pathway on all thirty-one vessels. Facility management also intends to add the vessels to a routine contamination survey program, review the adequacy of the applicable in-service inspection, and to move the vessels from the outdoor pad into a nearby waste storage dome.

Longer-term, LANL personnel need to take existing conceptual ideas on how to ultimately dispose of these items and mature them into well defined and executable dispositions plans. None of the Area G vessels are part of the baseline scope of the Confinement Vessel Disposition (aka Bolas Grande) Project that will be executed in CMR.

Plutonium Facility: This week, LANL management submitted for NNSA review and approval a Safety Basis Strategy (SBS) document that addresses the upcoming May 2011 Plutonium Facility DSA update that will include a major revision to analysis of the seismically-induced fire scenario. Whereas existing analysis assumes a seismic event could result in an intensely hot fire that engulfs an entire floor of the facility, the SBS proposes a new analytical approach intended to justify reducing the number and size of seismically-induced fires assumed in the scenario. This new approach would use published statistical data to determine the conditional probability of a given number of post-seismic fires occurring and updated facility combustible loading information to determine the maximum credible size and temperature characteristics of fires. The SBS then proposes using this refined seismically-induced fire scenario to re-evaluate leak path factors, airborne release fractions, and respirable fractions that are used in the accident analysis to calculate offsite dose consequences.

Federal Oversight: This week, the NNSA site office issued a letter that identified deficiencies with the laboratory's abnormal event investigation process and directed the contractor to develop corrective actions. In the letter, the site office asserts that: • some responsible managers are reluctant to hold formal critiques following an abnormal event; • some facilities have resumed operations prior to holding a critique to ensure all causes have been identified and all appropriate actions have been taken to prevent recurrence; and • some facilities have improperly categorized events. The letter requests that the contractor provide a report by January 15, 2011, that contains corrective actions to improve the laboratory's abnormal event investigation process, metrics for tracking these improvements, and a scheduled date for an effectiveness review.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 31, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director

FROM: B.P. Broderick and R.T. Davis

SUBJECT: Los Alamos Report for Week Ending December 31, 2010

The site representatives were out of the office this week. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 7, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 7, 2011

Plutonium Facility – Safety Basis: LANL continues to pursue implementation of Technical Safety Requirements (TSRs) associated with the Documented Safety Analysis (DSA) that was approved in December 2008. This safety basis represented the first major update to the Plutonium Facility safety basis in a decade. While most TSR controls have been implemented, upgrades and improvements to the fire suppression system and implementation of material-at-risk (MAR) controls have extended the implementation of this safety basis. Fire suppression system upgrades were completed last year, including installation of additional fire water risers and relocation/installation of sprinklers to resolve coverage issues. LANL also continues efforts to implement a new MAR tracking software system that will support TSR MAR controls. The Plutonium Facility is the first facility to implement this software. LANL plans to use this software at other nuclear facilities.

In early-November, LANL submitted a revision to the 2008 DSA to resolve site office comments on the fire suppression system limiting conditions for operation and to accommodate MAR associated with legacy confinement vessels stored on an asphalt pad outside the Plutonium Facility. LANL committed to complete implementation within 90 days of site office approval of this revision. The site office continues to review this document.

In December 2010, LANL submitted an annual update to the Plutonium Facility DSA. The 2010 DSA incorporates routine corrections/additions and inclusion of facility improvements and Unreviewed Safety Questions that have been identified since the DSA that was submitted in 2009. No site office action was taken on the 2009 DSA. In the submittal, LANL notes that a significant revision to the safety basis is planned for May 2011 to reanalyze seismic accident scenarios by “performing more thorough, realistic analyses.”

Plutonium Facility – PISA: This week, Plutonium Facility management declared a PISA related to two types of safety class controls used to contain ²³⁸Pu-enriched Heat Source Plutonium (HS-Pu). Certain completed heat source assemblies and robust containers for storing bulk HS-Pu oxide are credited in the Plutonium Facility DSA to survive the most severe accident scenarios postulated for the facility. Because these safety class assemblies and containers are credited to survive bounding accident conditions without releasing their contents, the HS-Pu they contain does not count toward facility MAR limits.

Facility personnel recently discovered that analyzed temperatures for glovebox fires exceed the temperatures that the safety class assemblies and containers are credited to survive. This discovery resulted in the PISA declaration. In response, facility management instituted a compensatory measure to begin counting the HS-Pu material inside the safety class assemblies and containers against glovebox MAR limits and to ensure all affected gloveboxes contained less than their allowed limits. Longer term, facility personnel intend to reevaluate the safety basis approach for analyzing and crediting these safety class controls.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 14, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 14, 2011

Plutonium Facility: This week, the NNSA site office conducted a workshop with LANL personnel to discuss the status of Seismic Analysis of Facilities and Evaluation of Risk (SAFER) project activities related to the Plutonium Facility; details of the conceptual design for upgrading the fire suppression system to seismic performance category-3 (PC-3); and the path forward and status of Recommendation 2009-2 deliverables. LANL personnel noted that the facility seismic evaluation was behind schedule and would not be complete, including peer review, until April (previous schedule was January). To accommodate this delay, Plutonium Facility personnel plan to request an extension to the SAFER Justification for Continued Operations associated with increased seismic hazard identified in the 2007 updated probabilistic seismic hazard analysis. LANL personnel asserted that the new schedule remains adequate to support the Documented Safety Analysis update scheduled for May (identified as a Recommendation 2009-2 deliverable) that will describe the proposed laboratory strategy for addressing challenging seismic accident scenarios.

The conceptual design for the fire suppression system upgrade to PC-3 has been submitted to the site office. NNSA plans to provide comments on the design this week. LANL noted that other Recommendation 2009-2 deliverables are on schedule including the conceptual design for PC-3 upgrades to appropriate portions of the confinement ventilation system.

Transuranic Waste Operations: Technical Safety Requirements (TSRs) for the WCRR repackaging facility include Limiting Conditions for Operation (LCO) associated with combustible loading. One of these combustible loading LCOs states that no combustible liquids shall be stored or used within the WCRR repackaging facility when inventory is present except combustible liquids found inside waste drums undergoing repackaging activities. There is a daily surveillance requirement associated with this LCO to verify that no combustible liquids are stored or used in the facility when inventory is present. Last week, facility personnel recognized that drum lift devices collocated with the waste characterization glovebox contain hydraulic fluid that is combustible. In response, facility management declared a potential inadequacy of the safety analysis. NNSA site office personnel have questioned whether this issue should have been categorized as a TSR violation rather than a PISA since the facility has operated for several years without complying with a combustible loading LCO and having performed TSR-level surveillances throughout this time affirming that no combustible liquids were used or stored in the facility when in fact combustible liquids were present.

This week, LANL submitted and NNSA approved a TSR change that only prohibits combustible liquids with a flammability rating exceeding a certain threshold, which hydraulic fluids do not exceed.

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL recently submitted a Basis for Interim Operations (BIO) and new TSRs to the site office for approval. This Documented Safety Analysis was developed in accordance with 10 CFR 830. These documents update the previous safety basis submitted in September 2009 that had numerous comments from the site office. RLWTF is currently operating under a safety basis that was approved in 1995. The BIO supports hazard category 3 liquid waste operations with a material-at-risk limit of 55 Am-241 equivalent Ci, one safety significant design feature (transuranic waste tanks) and 10 safety management programs.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 21, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 21, 2011

Plutonium Facility - PISA: Several months ago, the Plutonium Facility received a shipment of Pu-238 in two containers from Lawrence Livermore National Laboratory. The material was packaged in nested inner and outer welded containers that met the specifications of DOE-STD-3013, but the Pu-238 inside was not stabilized in the manner required by the standard. The Plutonium Facility safety basis does not explicitly analyze the hazards associated with Pu-238 stored in this type of welded container configuration. As a result, Plutonium Facility management declared a potential inadequacy of the safety analysis (PISA).

In response, Plutonium Facility personnel are evaluating the two containers to determine whether they are appropriate for multi-year storage of Pu-238 until the material is needed to support programmatic activities. Also, personnel are assessing ways to strengthen the process used to review incoming shipments to ensure that received material meets Plutonium Facility requirements.

Weapons Engineering Tritium Facility (WETF): This week, the site office approved the inputs, methods and assumptions that will be used for the Documented Safety Analysis (DSA) update planned for WETF. Notably, LANL plans to reduce the material-at-risk limit for WETF to less than 250 g versus the current limit of 400 g. In September 2010, LANL submitted a resource loaded schedule for the DSA update that identifies a May 2012 target date for completion of this update.

Plutonium Facility – Safety Basis: This week, LANL submitted a revision to the Technical Safety Requirements (TSR) associated with the 2008 DSA to resolve site office comments on the limiting conditions for operation for the fire suppression system. This revision of the TSR requires that both the electric and diesel fire pumps be operable. LANL has committed to implement the TSRs associated with the 2008 DSA within 90 days of site office approval.

Next week, Plutonium Facility personnel plan to take an outage to install seismic shutdown switches that will isolate power to non-safety-related laboratory floor circuits on indications of a seismic event. Post modification testing will either occur as a part of this outage or during a subsequent outage. LANL plans to have this system operational by the end of February. Safety basis credit for this system will be included in the May 2011 safety basis update.

Plutonium Facility – Seismic Safety: The site office forwarded the conceptual design for the fire suppression system upgrades required to meet performance category-3 (PC-3) seismic requirements to NNSA Headquarters this week. This design is identified as a deliverable for Recommendation 2009-2 and, when implemented, will help improve facility safety for the challenging post-seismic fire accident scenario. The LANL analysis concludes that the following system upgrades are required to meet PC-3 requirements: for the main floor, a lateral support is required two-thirds down each branch line and an end support is needed; for the basement, axial supports are required for standpipes and lateral supports are needed for some piping sections and; for the pump houses, additional supports are required for supply lines.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 28, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 28, 2011

Electrical Safety: This week, Plutonium Facility management declared a near miss based on work performed in close proximity to 13,200 volt energized electrical lines without appropriate work control documentation or applicable hazardous energy controls. As a part of the Nuclear Materials Safeguards and Security Upgrades Project (NMSSUP), work was planned to install conduit, pull lines and tie into this 13,200 line. Two Integrated Work Documents (IWDs) were developed for these activities. The first IWD hazard analysis did not include work on or near energized electrical lines. In December, workers performed core drilling as part of the conduit installation within a few inches of the energized line using the first IWD. This activity was conducted successfully with no injury to workers or damage to the electrical line. A pre-job brief was conducted; however, workers noted that the IWD requirements were not discussed during this brief. In preparation for conducting the additional work under the second IWD, LANL personnel recognized that the drilling had occurred and notified Plutonium Facility management.

As a result of this near miss, LANL suspended NMSSUP construction activities while the requirements for conduct of pre-job briefs and actions needed if hazards and work controls are not appropriately included in IWDs were clearly communicated to project personnel and subcontractors. LANL is releasing specific construction activities following a review of work scope and work control documents. LANL also continues to investigate this event to develop lessons learned and to determine whether additional corrective actions are needed.

Transuranic Waste Operations: Transuranic waste drums in general waste storage arrays at Area G are restricted to less than 200 fissile gram equivalents by criticality safety limits. Drums that exceed this limit are segregated and stored in special arrays whose geometry is controlled to ensure criticality safety. Generator facility data is used to determine a drum's fissile gram equivalents until a valid assay is obtained by Central Characterization Project (CCP) personnel at Area G. Based on a 2007 technical study, the fissile gram equivalents value used for criticality safety purposes is the CCP assay result plus two times the uncertainty from counting statistics. This differs from the assay result plus the total measurement uncertainty used to determine whether a drum's fissile gram equivalents comply with the Waste Isolation Pilot Plant (WIPP) waste acceptance criteria. When a drum's fissile gram equivalents using the total measurement uncertainty exceed 200 g but its value using two times counting uncertainty does not, a Non-Conformance Report tag is applied to the drum and it is returned to a general waste array rather than a specially controlled array. As a result of these practices, there are currently about 200 drums in general waste storage arrays with NCR tags that identify them as drums with high fissile gram equivalents. Last week, the NNSA site office issued a letter to the contractor questioning the treatment of these drums.

This week, Area G personnel discovered that the configuration of a segregated array of high fissile gram equivalent drums violated the geometry restrictions specified by criticality safety limits. In response, facility management restricted access to the area and entered the criticality safety infraction process. Operations personnel and criticality safety engineers are coordinating to develop a recovery plan to address the infraction.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 11, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 11, 2011

Federal Oversight: All of the issues discussed in this report were initially identified and pursued by NNSA site office facility representatives and subject matter experts.

Transuranic Waste Operations – Criticality Safety: In response to concerns raised by NNSA site office personnel, a laboratory team recently reviewed the adequacy and implementation of criticality safety controls at Area G. This week, the team comprised of lab criticality safety engineers and institutional criticality safety committee members provided a briefing to site office and LANL management on the results of their review. The team concluded that Area G compliance with the institutional criticality safety program is immature. As a result of this immaturity, the team identified three criticality safety infractions during their review. Two infractions were declared because sludge and debris waste remediation operations at Area G had not been formally reviewed by criticality safety personnel, as required. Another infraction was declared because procedures governing the staging of drums for characterization activities did not ensure the segregation and special control of drums exceeding 200 fissile gram equivalents as required by established criticality safety limits (site rep weekly 1/28/11).

Weapons Engineering Tritium Facility (WETF): An ongoing NNSA site office review of facility status control evaluated a sampling of work packages used by facility personnel over the past year to make modifications to the safety significant Tritium Waste Treatment System (TWTS). Each of the packages reviewed were found to have various deficiencies, which taken together indicate significant weaknesses in conduct of operations and configuration management. Among other things, the review found that key documents, such as the System Alignment Checklist were not updated as required after new valves were installed; the required Return-to-Service checklist process was not used prior to restoring TWTS status to operable after modifications; and required material qualification certifications of credited components were not performed prior to installation.

Transuranic Waste Operations – Safety Basis: Yesterday, based on an issue identified by an NNSA Facility Representative, WCRR repackaging facility management reported a TSR violation based on a surveillance requirement that had not been successfully performed within its required frequency. The WCRR fire suppression system is credited as a safety significant control. WCRR TSRs include a surveillance requirement to perform a monthly valve alignment inspection to ensure an open flow path exists between water tanks and the facility fire suppression system. In performing this surveillance, facility personnel rely on affirmation from the institutional utilities group that three credited valves in the water distribution system are in the open position. The utilities group performs visual valve inspections on a nominally monthly basis, but execution of this work can and sometimes does slip beyond the frequency required by the WCRR TSRs.

When informed that the valve inspection by the utilities group had not been performed within the required interval, WCRR management had the valves inspected and all were found in the required open position. In response to this discovery, facility management intends to revise the WCRR surveillance procedure to require facility personnel to perform the credited valve inspection.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 18, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 18, 2011

Dunlevy was onsite this week for site familiarization activities.

Plutonium Facility – Seismic Safety: As part of the Plutonium Facility seismic safety improvements, LANL recently installed seismic shutdown switches that will isolate power to non-safety-related laboratory floor circuits upon indication of a seismic event. When operational, this system will help reduce the likelihood of post-seismic fire initiation. Last weekend, Plutonium Facility personnel successfully performed post installation testing of the switches. LANL plans to maintain the system in bypass mode for several weeks to review performance prior to declaring the system operational. Installation of the seismic switches is identified as an Implementation Plan deliverable for Recommendation 2009-2 (due April 2011). Safety basis credit for this system is expected to be considered for inclusion in the May 2011 Documented Safety Analysis update.

LANL also recently submitted the conceptual design for upgrading a portion of the Plutonium Facility confinement ventilation system to safety class including seismic upgrades to meet Performance Category (PC)-3 requirements. The design is based on input from the ventilation and support system backfit analyses, ventilation modeling and the Seismic Analysis of Facilities and Evaluation of Risk (SAFER) evaluation of system components. The design includes upgrades for the zone-2 bleed-off exhaust system, glovebox exhaust fans, the electrical distribution system, the uninterruptible power supply and a new control system. Based on the preliminary cost estimate for these upgrades (which cannot be finalized until SAFER analysis for the building structure is completed), LANL notes that a capital asset line item project subject to DOE Order 413.3 would be required to implement a safety class ventilation system that meets PC-3 seismic requirements.

Transuranic Waste Operations – Safety Basis: Recently, NNSA site office engineers questioned whether existing hydraulic calculations for the safety significant RANT fire suppression system accounted for the correct number of sprinklers in the most hydraulically remote area of the facility. After resolving discrepancies between system drawings and the actual as-found system configuration, laboratory personnel performed a new hydraulic calculation. The new calculation included one additional sprinkler in the most hydraulically remote area and concluded that the required water flow rate needed to ensure RANT fire suppression system operability is greater than the flow rate required by the TSR. Based on this new information, facility management declared a Potential Inadequacy of the Safety Analysis (PISA) this week.

Radioactive Liquid Waste Treatment Facility (RLWTF): On Tuesday, a tubular ultra filter (TUF) connection assembly failed releasing approximately 20 gallons of low activity liquid waste from the low level waste processing system. Facility personnel responded appropriately upon discovery of the leak. TUF connection assembly failures have been a recurring problem at RLWTF. In response to previous failures, facility personnel implemented a remote shutoff capability that allowed operators to safely secure the system and limit the release during this event. Based on the known failure modes of the TUF, facility management has been pursuing replacement of this system with a series of more reliable pressure filters targeted for installation by the end of this fiscal year.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 25, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 25, 2011

Staff members Bamdad, Caleca, Gibson, Kimball, Moury, Pasko and Shuffler held a teleconference with LANL personnel this week to discuss the conceptual design for fire suppression system seismic upgrades at the Plutonium Facility.

Material Disposal Area (MDA)-B: This week, MDA-B management curtailed operations in an excavation enclosure when multiple glass jars were unearthed and found to contain beryllium fines. This operation will remain suspended until appropriate controls and training are implemented.

Overall, MDA-B continues to perform work under the approved 10CFR830 exemption that authorizes operations involving material at risk (MAR) up to 56 ²³⁹Pu-equivalent (PE)-Ci. To-date, the pace of excavation activities have outstripped the pace of material shipments, resulting in the accumulation of about 26 PE-Ci staged above ground in metal storage bins with secured lids. The bins are located in roughly 20 segregated waste container storage areas that are authorized and controlled in accordance with the NNSA-approved Facility Safety Plan. Laboratory personnel are attempting to ramp-up material shipments to accelerate deinventory of accumulated above ground MAR. In the meantime, LANL has committed to formally notify the NNSA site office if the total MAR inventory exceeds 28 PE-Ci and further committed to suspending active MDA-B excavation if MAR reaches 45 PE-Ci (site rep weeklies 10/22/10, 10/15/10, 9/10/10).

Readiness: This week, the NNSA site office formally requested that LANL review recent adverse indicators in the readiness review program and identify corrective actions to improve the execution of the readiness review and startup process. The request noted several examples of recent issues for startup activities at Area G and the difficulties in resuming operations at the Weapons Engineering Tritium Facility to support an important programmatic deliverable.

Chemistry and Metallurgy Research (CMR) Building: To improve safety and operational reliability at CMR, LANL plans to replace the four exhaust ventilation fans in Wings 5 and 7. Currently, one of the fans in Wing 5 has been replaced with system testing on-going. This fan is expected to be operable in March. Initial activities to support replacement of the first fan in Wing 7 have also started. LANL had also planned to replace the Wing 5 and 7 HEPA filters this year; however, quality assurance issues with the vendor may delay completion of this activity until 2012.

Transuranic Waste Operations – Criticality Safety: This week, LANL forwarded to the NNSA site office the final report for the assessment of the criticality safety management program at Area G (preliminary results noted in the 2/11/11 site rep report). Overall, LANL concludes that the activities at Area G comply with the safety margins required by ANSI/ANS 8.1. In addition, program improvements and maturity consistent with the nuclear criticality program safety improvement plan continue to be pursued at Area G. The assessment team also recommended that LANL management reconsider a 2007 decision to use new fissile gram equivalent values generated by Central Characterization Project personnel, once available and validated, to replace fissile gram equivalent data provided by waste generators. This recommendation is being evaluated.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 4, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 4, 2011

Pasko was onsite this week to attend a workshop on the conceptual design for potential seismic upgrades to portions of the Plutonium Facility ventilation system.

Transuranic Waste Operations - Readiness: This week, the contractor readiness assessment (CRA) team completed their review of drum venting operations at Area G and concluded that line management has not successfully demonstrated readiness to commence operations, meaning the CRA will need to be re-performed in the future. The team identified nine pre-start findings, one post-start finding and seven observations. Pre-start findings included inadequate technical bases to demonstrate compliance with functional requirements for two credited design features, an incorrectly written procedure, failure to follow procedures, inadequate operator training and failure to demonstrate adequate emergency response capability. LANL management intends to develop lessons learned based the results of this review. In addition, these issues will be factored into the response to the NNSA site office request on improving the startup process, which included several examples of startup problems at Area G (site rep weekly 2/25/11).

WCRR Repackaging Facility – Conduct of Operations: There have been a series of events over the past several weeks at the WCRR repackaging facility where personnel failed to initiate or properly execute procedures.

Two weeks ago, an operator was using a drum dolly to transfer transuranic waste drums out of the WCRR facility and onto a truck to prepare for onsite shipment. During the transfer evolution, the operator lost control of a waste drum which tipped over and fell on the ground. WCRR personnel did not initiate execution of an abnormal operating procedure as required in the event of a dropped or tipped drum. Last week, a glovebox glove was breached during WCRR operations. Upon detection of the breach, WCRR personnel did not use an abnormal operating procedure, as required.

This week, WCRR operations center personnel completed and filed the wrong checklist to effect a TSR mode change to allow waste processing operations. At the beginning of a shift, one operations center operator completed the appropriate checklist to transition from Warm Standby mode to Operations mode and pre-filled the checklist to change from Operations mode to Warm Standby mode that would be needed at the end of the day's operations. The operator inadvertently handed the wrong checklist to another operator who signed and filed it and the facility began waste processing operations. Later the same day, the error was discovered by an individual performing Senior Supervisory Watch when he was reviewing operations center documentation.

In response to the first two events, facility management conducted refresher briefings for operators on abnormal operating procedures and instituted a Senior Supervisory Watch for WCRR operations. After the latest event, management paused work to discuss conduct of operations issues with facility personnel. This negative conduct of operations trending has coincided with a significant increase in operational tempo at WCRR, which has moved to 12 hour a day, 7 day a week operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 11, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 11, 2011

WCRR Repackaging Facility – Safety Basis: Last week, facility management declared a Potential Inadequacy of the Safety Analysis (PISA) and subsequent positive Unreviewed Safety Question at the WCRR repackaging facility based on inconsistencies between the actual glovebox exhaust ducting configuration and assumptions made in the safety basis. The WCRR safety basis analysis on glovebox fire challenges to HEPA filter performance is based on a Plutonium Facility glovebox fire analysis and includes an assumption that the WCRR exhaust ventilation configuration is consistent with the Plutonium Facility glovebox ventilation configuration. Field observations identified that the WCRR glovebox exhaust consists of dual 2.25” exhaust pipes rather than a single 2” exhaust pipe assumed in the safety basis. The WCRR repackaging facility was placed in cold standby when the inconsistency was identified. LANL has completed an evaluation of the safety of the situation that includes new fire analysis with the correct exhaust configuration and concluded that the maximum temperature at the HEPA filters during a glovebox fire would be acceptable. LANL has requested site office approval to resume normal operations and plans to prepare safety basis changes to address this issue.

This week, WCRR facility management declared a TSR violation related to the uninterruptible power supply (UPS) system that is credited to ensure continued operation of the ventilation system in the event of loss of offsite power. The WCRR TSRs specify an annual surveillance requirement to test the ability of the UPS system to supply one hour of power to all required loads. The TSR violation resulted from the discovery that the UPS load test procedure did not call for the system to be tested in alarm mode. Since the alarm is a required load, the test did not comply with the TSR surveillance requirement.

Federal Oversight: Both the PISA and TSR violation discussed above were discovered by an NNSA site office safety system oversight (SSO) engineer. The site office engineer was shadowing a contractor team that was performing a vital safety system assessment of the WCRR ventilation system. The NNSA engineer brought the issues to the attention of facility management after the contractor VSSA ended with facility engineers failing to identify these problems. Site office personnel in general and this NNSA SSO engineer in particular have identified a significant number of recent PISAs and TSR violations at LANL nuclear facilities.

Electrical Safety: This week, LANL personnel provided an outbrief on the results of their investigation of a utility vault core drilling activity that occurred in December 2010. The core drilling activity was performed within inches of energized 13.2 kV electrical lines and this hazard was not identified and addressed in the Integrated Work Document (IWD). The team concluded that the event represented a significant safety concern with opportunities for work control improvements and lessons learned. Notably, and consistent with previous work control reviews at LANL, the team concluded that the implementation of Integrated Work Management needs improvement including use of IWDs during pre-job briefs and work execution, better scope definition in IWDs and enhanced assurance that only appropriately trained and qualified personnel are used for work execution. The results of this investigation have been provided as input to a broader review chartered by the LANL Deputy Director to develop a comprehensive understanding of obstacles and issues negatively impacting LANL’s Integrated Work Management implementation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 18, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 18, 2011

Plutonium Facility – Seismic Safety: This week, Plutonium Facility personnel placed the recently installed seismic shutdown switches on-line after monitoring system performance for several weeks. This system will isolate power to non-safety-related laboratory floor circuits on indication of a seismic event. An alarm response instruction and abnormal operating procedure have been developed for facility personnel to respond to initiation of this system. These switches will help reduce the likelihood of post-seismic fire initiation and is identified as a deliverable for Recommendation 2009-2.

Plutonium Facility – Safety Basis: Plutonium Facility management has submitted for NNSA site office review and approval a Justification for Continued Operations (JCO) related to sealed packages that contain ²³⁸Pu-enriched heat source plutonium (HS-Pu). Facility management has declared three recent PISAs related to the handling and storage of the large and diverse population of sealed HS-Pu containers housed in the Plutonium Facility. Because the existing DSA does not comprehensively analyze hazards associated with all sealed HS-Pu container configurations in the facility, which led to the PISAs, the JCO submittal attempts to address all activities involving all types of sealed HS-Pu containers in a holistic manner. NNSA office site review of the JCO is ongoing.

Readiness: On Monday, LANL responded to a recent site office request to review recent adverse indicators in the readiness review program and identify corrective actions to improve the execution of the readiness review and startup process. The review identified the following three causal factors: 1) LANL has failed to adequately implement requirements for timely planning and execution of readiness verification activities; 2) LANL has not used available planning tools to develop adequate assessment criteria for line management verification of readiness; and 3) LANL has not effectively executed appropriately objective and critical self-assessments prior to commencing readiness review activities.

Based on these issues, the response to the site office proposes several improvement initiatives including implementation of an institutional procedure on the conduct of line management readiness verification activities, use of a startup notification report affidavit that ensures programmatic input/concurrence and identification of a senior supervisory watch for Area G readiness activities (several recent readiness and startup issues have occurred at Area G).

Chemistry and Metallurgy Research (CMR) Building: As required by a condition of approval identified in the site office Safety Evaluation Report, LANL submitted an update last week on the status of the evaluation of designating the CMR electrical distribution system as safety significant. LANL plans to perform a system adequacy analysis on the system and establish the minimum requirements needed for the system to perform its safety function along with identifying appropriate surveillance and inspection requirements. The final evaluation of the system is scheduled to be complete in July 2011. The safety basis will be updated to reflect the safety significant designation during the next annual update following the July final evaluation.

Management: This week, LANL management announced an organizational change that elevates the manager responsible for large capital projects, including the CMR Replacement Facility, from the Associate Director level to the more senior Principal Associate Director level.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 25, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 25, 2011

WCRR Repackaging Facility: As reported on March 4th and March 11th, there have been a number of recent conduct of operations, engineering and safety basis issues at the WCRR repackaging facility. These issues prompted WCRR facility management to pause transuranic waste processing operations on February 28th. WCRR resumed operations on March 18th, after facility personnel executed a resumption plan that included some compensatory measures intended to mitigate identified deficiencies. This week, WCRR operations encountered a series of additional problems discussed below. Transuranic waste inventory has been removed from the facility and the WCRR building is currently in cold standby mode.

On March 20th, four transuranic waste drums were transferred into the WCRR facility without proper verification that they complied with TSR-level facility material-at-risk (MAR) limits. An operations center operator used data for the wrong set of drums to perform the required MAR calculation then failed to have the calculation independently verified, as required by the surveillance procedure. WCRR personnel later identified the issue and took appropriate action. Although the facility MAR limit was never exceeded, WCRR management reported a TSR violation for a surveillance requirement that was not successfully performed within the required frequency. (The operator who performed the surveillance was later transferred from the facility to the hospital for a medical issue, which may have contributed to the event.)

On March 21st, WCRR engineering personnel discovered that the facility procedure used to perform a surveillance on the credited fire suppression system did not adequately implement the TSR surveillance requirement to verify that an unobstructed flow path exists between the fire water supply tank and facility sprinkler heads. The implementing procedure failed to require inspection of one facility valve that could obstruct the fire water flow path if it were in the closed position. Although the affected valve was found in the open position, facility management declared a TSR violation based on the procedural inadequacy.

Also on March 21st, WCRR engineering personnel discovered that a key safety basis assumption stating that no transuranic waste would be stored or processed in the decommissioned size reduction glovebox enclosure (GBE) had failed to be carried forward as a TSR-level Specific Administrative Control, as required. This discovery led to the declaration of a Potential Inadequacy of the Safety Analysis.

This week, facility personnel also observed containers of potentially flammable liquid inside the GBE that had never been identified by daily TSR surveillances required to verify that no flammable liquids are present in the facility. WCRR personnel plan to make a controlled entry into the GBE to recover the suspect containers to determine whether they contain flammable liquids or are empty. Categorization and reporting for this discovery are on hold pending results from the GBE entry and container evaluation.

Although significant new issues continue to surface at WCRR, the recent series of problems were identified by laboratory rather than NNSA personnel. This appears to be due, in part, to increased LANL attention on previously identified problem areas and the implementation of compensatory measures such as the assignment of a Senior Supervisory Watch and enhanced engineering reviews of credited systems. However, based on the number and nature of recent problems, this week the NNSA Site Office Manager sent a letter to LANL management expressing concerns about WCRR. A LANL senior manager has now been assigned to evaluate WCRR corrective actions and determine when operations can be safely resumed.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 1, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 1, 2011

Plutonium Facility – Criticality Safety: This week, Plutonium Facility management declared a TSR violation based on the discovery that the material form of some plutonium items stored in two vault rooms does not comply with criticality safety requirements specified in a Justification for Continued Operations (JCO). Vault rooms B and I have been operating under a JCO since 2007 when laboratory personnel found that criticality safety limits for locations in these rooms were not adequate to prevent criticality under all normal and credible abnormal conditions. Criticality safety controls in the current JCO revision only provide approved material limits for plutonium metal and oxide items. On Monday, Plutonium Facility vault operators recognized that 22 plutonium residues and 9 plutonium compounds are currently stored in vault rooms B and I, in violation of JCO controls that only allow metal and oxide forms.

Plutonium Facility – Seismic Safety: The site office recently responded to the LANL analysis of options to achieve a seismically-qualified safety-class active confinement ventilation system and requested refinement of the baseline scope considering additional upgrade options. Upgrade and seismic qualification of the bleed-off subsystem and minimum power and controls is identified as the baseline scope. As the preferred alternative is refined, LANL plans to consider the following additional scope beyond the baseline: equipment and ducting downstream of the glovebox exhaust filter plenums; portions of the recirculation system; full ventilation control system upgrade; new diesel generator building (south of facility) versus reuse of the north-side generator building; and flywheel generators. The site office notes that a workshop would be an appropriate forum for evaluation of these different options.

Material Disposal Area-B (MDA-B): This week, the site office directed LANL to provide a path forward for aggressively reducing radioactive inventory at MDA-B. Early this month, LANL notified the site office that above ground inventory at MDA-B exceeded 28 PE-Ci. In accordance with previous correspondence, LANL is required to notify the site office when inventory is greater than 28 PE-Ci. The site office direction requests the current waste shipment schedule and the programmatic and operational drivers that require above ground inventories above 28 PE-Ci. The site office also directed LANL to provide additional notifications if inventory levels exceed 35 PE-Ci and again at 40 PE-Ci.

Safety Basis: Based on recent application of the new information process, the site office has directed that LANL review the site procedure as used in these recent applications and submit recommended improvements to the site office for concurrence. The site office notes that the LANL new information procedure appears to circumvent requirements for contractor actions upon discovery of a Potential Inadequacy of the Safety Analysis (PISA). For several recent issues identified at the WCRR repackaging facility, LANL followed the new information process and concluded these issues would not result in PISAs and exited the process. The site office concluded that for these issues, LANL use of the new information process went beyond determining if the information was credible and had a nuclear safety nexus, which possibly resulted in incomplete execution of the unreviewed safety question process.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 8, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 8, 2011

Broderick was out of the office this week.

Plutonium Facility – Seismic Safety: On Tuesday, the staff held a teleconference with site office and LANL personnel to discuss the on-going seismic analysis of the Plutonium Facility structure, systems and components. This evaluation will support a path forward for the outstanding Justification for Continued Operation (JCO) associated with the updated probabilistic seismic hazards analysis and upgrade decisions in response to Recommendation 2009-2, *LANL Plutonium Facility Seismic Safety*. The seismic evaluation is scheduled to be complete in mid-May followed by review and comment from the peer review team resulting in a final product at the end of May. At that time, LANL also plans to submit an update to the Documented Safety Analysis (DSA) that includes a major revision to the bounding seismic accident scenarios.

Transuranic Waste Operations: On Thursday at the WCRR Repackaging Facility, operators identified a bulging 55 gallon inner drum after de-nesting the drum from an 85 gallon overpack drum. WCRR personnel responded appropriately and followed the abnormal operating procedure that required contacting the emergency response organization. After initial evaluation, the HAZMAT response team was also requested and responded to the facility. Portable HEPA filtered ventilation was moved in proximity to the drum and a robotic system was deployed to remove the vent from the 55 gallon drum to relieve any residual pressure in the drum. The vent was replaced and the drum was subsequently repackaged in the WCRR waste characterization glovebox. Limited contamination was identified on the portable ventilation system but no other facility contamination was identified.

Plutonium Facility – Safety Basis: Last week, LANL began the Implementation Verification Review for the fifth phase of the Technical Safety Requirements (TSRs) associated with the DSA approved in 2008. The primary focus of this review is on implementation of controls associated with the safety class fire suppression system. These controls are scheduled to be declared implemented by April 21st.

LANL has also requested site office approval to delay overall implementation of the 2008 TSRs from April 21st to June 3rd due to delays in development and deployment of the MAR Tracker software program that will be used to complete TSR MAR surveillances. LANL notes that implementation involves 4,000 material locations, multiple software database and program interactions and several Plutonium Facility organizations. Currently, a number of issues have been identified as a part of the software Validation and Verification process that require resolution prior to declaring TSR implementation.

Material Disposal Area-B (MDA-B): Based on a review of the MDA-B Facility Safety Plan in February, the site office requested that LANL revisit the institutional procedures and processes on facility chemical hazard categorization. The LANL response notes that the public and collocated worker protection criteria from DOE Standard 1189 will be used for future chemical hazard classification purposes. The revised methodology will be issued in a safety basis bulletin within 10 days of site office concurrence.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 15, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 15, 2011

Plutonium Facility – Seismic Safety: This week, LANL declared a Potential Inadequacy of the Safety Analysis (PISA) based on preliminary seismic evaluation results that indicate an increased likelihood of structural failure in some locations during postulated seismic events. In 2007, the Probabilistic Seismic Hazard Analysis for Los Alamos was updated and indicated increased seismic hazard for LANL facilities. A Justification for Continued Operations (JCO) for nuclear facilities was approved by the site office while the Seismic Analysis of Facilities and Evaluation of Risk (SAFER) project was initiated to evaluate the impact of the increased hazard. The SAFER evaluation of all LANL nuclear facilities except the Plutonium Facility was completed last year. The Plutonium Facility analysis has been ongoing and is now expected to be complete in May including independent peer review and resolution of comments.

Currently, SAFER preliminary results have identified nine Plutonium Facility issues where the anticipated seismic demand may exceed the structural capacity during the design basis seismic event. The potential failures may invalidate safety basis assumptions related to the facility's leak path factor in the 2008 Documented Safety Analysis (DSA), which is scheduled to be fully implemented within two months, and may impact assumptions in the yet to be approved 2010 DSA. As a part of the PISA declaration, LANL has identified a compensatory measure to develop and implement an emergency operating procedure to isolate the facility's exhaust stacks during certain seismic accident conditions to eliminate a potential unfiltered material release path that could result from two of the newly identified failure modes. The PISA is expected to result in an unreviewed safety question and safety basis personnel are developing an evaluation of the safety of the situation. Plutonium Facility management noted that facility upgrades to resolve these issues are being evaluated.

Weapons Engineering Tritium Facility (WETF): This week, the NNSA site office issued a letter to LANL senior management addressing WETF. In its letter, the site office notes numerous issues that have stemmed from WETF's existing nine year old safety basis, identified deficiencies in key safety management programs, and the existence of a significant population of legacy tritium containment vessels that need to be dispositioned to address safety concerns. The site office asserts that despite WETF safely restarting and conducting limited operations to meet national security requirements last year, the laboratory infrastructure and support for WETF has not been commensurate with what is required to sustain safe nuclear operations over the long term. Given this, NNSA requests for LANL to provide the following within 30 days: • an accounting of anticipated mission and readiness activities; • a perspective on hazards for current operations and continued storage of legacy items until they can be dispositioned; and • a risk-prioritized path-forward to address known gaps in safety management programs and the means that LANL will use to ensure any new gaps are identified and addressed in a timely manner.

As part of WETF's planned risk reduction activities, WETF personnel are also poised to begin a campaign to overpack a large number of legacy tritium containment vessels that may present over-pressurization hazards and lack the pedigree currently required for containing tritium. These legacy items will either be overpacked in credited tritium containment vessels or introduced into gloveboxes.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 22, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 22, 2011

Transuranic Waste Operations – Safety Basis: This week, the discovery of new information related to the Area G Drum Venting System (DVS) prompted LANL management to declare a Potential Inadequacy of the Safety Analysis (PISA). Startup of the DVS is intended to reestablish the capability to safely vent the thousands of unvented drums currently stored above and below ground at Area G in preparation for final disposition. Earlier this year, LANL management declared implementation of the safety basis revision that covered DVS operations in advance of a Contractor Readiness Assessment (CRA), which ultimately failed to demonstrate adequate readiness to begin venting operations.

The implemented safety basis analyzes a drum deflagration event and the resulting overpressure challenges to DVS components. The analysis assumes the deflagration occurs in a drum with a 12% headspace gas concentration of hydrogen and also assumes the failure of internal DVS valves designed to contain blast pressure, allowing the deflagration overpressure to be vented into a greater volume. In the course of pursuing a question raised during the recent CRA, LANL personnel recognized that the assumptions related to hydrogen concentration and the failure of the blast valves may not be conservative. Higher hydrogen concentrations and actuation of the blast valves, both of which are credible, would lead to a more energetic deflagration confined to a smaller volume. This situation produces calculated pressure conditions inside the DVS chamber that are greater than those analyzed in the current safety basis, which prompted the PISA. LANL personnel are developing a path forward to address the PISA and evaluating the impact of these issues on the DVS startup schedule.

Integrated Work Management (IWM): Based on several events that occurred between late-2010 and early-2011 involving issues with work planning/execution and conduct of operations, the laboratory deputy director chartered a senior team to develop a comprehensive understanding of obstacles and issues negatively impacting LANL's IWM program. This team recently completed their review and identified the following four Judgments of Need (JON) along with recommendations for corrective actions to address these JONs: 1) LANL needs to accelerate full implementation of conduct of operations within craft and vendor work planning and execution; 2) LANL needs to strengthen the subcontractor technical representative program; 3) LANL needs to develop and implement an effective tool to evaluate operational performance that provides indicators for issues that require broad-based corrective actions; and 4) LANL needs to develop a mechanism to evaluate major organizational changes that may impact institutional IWM implementation. The team recommended nineteen specific corrective actions to laboratory senior management to address the identified JONs.

Seismic Safety: This week, the site office forwarded the Board's April 8th letter on issues with the computer software SASSI (A System for the Analysis of Soil-Structure Interaction) to LANL and requested a summary of the site's use of this code, information on code versions used, the basis for software quality assurance and any other information relevant to responding to the Board's letter. The site office directed LANL to respond to this request within three weeks.

Plutonium Facility – Seismic Safety: The site office memorandum discussed above also requests LANL to provide plans for identification and anchorage of critical equipment within Plutonium Facility gloveboxes

(e.g., furnaces that could contribute to post-seismic fire initiation). These plans will be included in the overall project execution plan for upgrades in response to Board Recommendation 2009-2.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 29, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 29, 2011

Plutonium Facility – Seismic Safety: Last week, LANL submitted an Evaluation of the Safety of the Situation (ESS) to the site office for the Potential Inadequacy of the Safety Analysis (which resulted in an Unreviewed Safety Question) based on preliminary seismic evaluation results that indicate an increased likelihood of structural failure in some locations during postulated seismic events. The ESS concludes that the potential consequences represent an acceptable risk and included one compensatory measure – a standing order to isolate the facility’s exhaust stacks during certain seismic accident conditions to eliminate a potential unfiltered material release path. This week, Plutonium Facility personnel issued the Emergency Operating Procedure that will replace the standing order and strengthen implementation of the compensatory measure. Facility personnel have also removed materials located in gloveboxes beneath mezzanines that were identified as seismically vulnerable. The site office has approved the ESS and the Plutonium Facility continues normal operations. Structural upgrade design efforts for some of the seismic issues have been initiated.

Emergency Preparedness: This week, laboratory management convened a meeting with all LANL Facility Operations Directors to discuss the state of emergency management and response planning and preparedness for challenging scenarios like an extended loss of offsite power and a large seismic event that could severely restrict all offsite utility services, communications and site access. The meeting was useful in indentifying specific areas where additional advance planning, drill activities, or investment in enhanced capabilities and equipment could improve the site’s safety posture and response in emergency conditions. Moving forward, each Facility Operations Director has been tasked to develop an Action Plan detailing areas they plan to pursue to strengthen emergency preparedness for their facilities.

Zero Liquid Discharge (ZLD) Project: Last week, an Energy Systems Acquisition Advisory Board reviewed the critical decision-3 package for the ZLD project and the acquisition authority (site office manager) approved start of construction activities. This project will provide capability to receive discharge from the Radioactive Liquid Waste Treatment Facility (RLWTF) and preclude the need for an evaporator unit operation or purified liquid discharge.

Plutonium Facility – Safety Basis: This week, LANL completed an Implementation Verification Review (IVR) for an additional phase of the Technical Safety Requirements (TSRs) associated with the safety basis approved in 2008. The IVR covered the following areas: Mode Change; criticality alarm system limiting conditions of operation (LCO); fire suppression system LCO; violations of TSRs; maintenance safety management program (SMP); procedures SMP and; the fire water supply and ion exchange resin (weapons grade) design features. Based on observation of activities and review of documentation, the team concluded that TSR controls reviewed were adequately implemented at the Plutonium Facility with the exception of 6 pre-implementation findings related to training, equipment availability to perform one surveillance and procedure issues. The primary remaining TSR control that has not been implemented relates to material-at-risk (MAR) limits. LANL continues to pursue adequate implementation of the MAR tracker software including software validation and verification. The site office recently approved an extension request that allows until

June 3rd for completion of this final phase.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 13, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 13, 2011

Davis was offsite this week.

The staff held a teleconference with NNSA and LANL personnel to discuss the site's response to the recent discovery of an increased likelihood of structural failures in certain portions of the Plutonium Facility during postulated seismic events.

Weapons Engineering Tritium Facility (WETF): In July 2010, WETF successfully completed an NNSA Operational Readiness Review allowing the facility to restart programmatic tritium gas handling activities after an extended operational suspension during which personnel worked to address significant pressure safety and safety basis issues. Soon after completing work to support an important national security deliverable in September 2010, WETF personnel discovered that small amounts of oxygen were leaking into a portion of the Tritium Gas Handling System called the Hot Inlet System where the air could potentially mix with tritium to form a flammable or explosive atmosphere. In October 2010, facility management declared a Potential Inadequacy of the Safety Analysis based on this issue and suspended tritium gas handling operations. In November 2010, the NNSA site office approved a Justification for Continued Operations (JCO) that would allow WETF to resume tritium gas handling operations upon implementation of a series of compensatory measures designed to address the potential deflagration hazard associated with oxygen ingress. The JCO compensatory measures have not been implemented and programmatic tritium gas handling operations remain suspended.

Since November, facility management has focused attention on the creation of a new set of hazard analyses that include comprehensive evaluation of deflagration hazards related to oxygen leakage into the Hot Inlet and Tritium Gas Handling Systems. In late April, LANL management submitted a revised JCO that incorporates the results of the new hazard analysis. The revised JCO, which was approved by the NNSA site office this week, credits additional engineered and administrative controls including a new material at risk limit of 100 g (and 52 g tritium processing limit) for the Tritium Gas Handling and Hot Inlet Systems.

The new hazard analyses will eventually serve as the foundation for a major revision to the facility's DSA and TSRs scheduled to be submitted in 2012. In the interim, LANL submitted and NNSA approved an annual update intended to be an incremental improvement to the facility's existing safety basis.

This week, LANL management also responded to formal NNSA direction to provide planning information for mission, readiness, risk reduction, and safety management program improvement activities. Safety-related priorities discussed in the response include •continued overpacking of non-pedigreed legacy tritium containment vessels into robust containers; •disposition of Early Storage Unit tritium vessels that are known to exceed their Maximum Allowable Working Pressure; and • installation of mercury traps required to remove trace amounts of mercury contamination from bulk tritium gas before this material can be shipped offsite.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 20, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 20, 2011

The site reps were offsite this week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 27, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 27, 2011

Management: This week, LANS announced that Charlie McMillan will replace Mike Anastasio as the Director of Los Alamos National Laboratory. McMillan had previously served as the Principal Associate Director for Weapons Programs and the Associate Director for Weapons Physics.

Plutonium Facility – Seismic Safety: LANL personnel have been aggressive in defining and pursuing necessary structural upgrades for the Plutonium Facility since discovering in late April that structural failures resulting from a seismic event are more likely than previously understood. This week, field construction activities began to install new support beams to address a high probability of failure vulnerability associated with glovebox ventilation filter plenum rooms. These upgrades are targeted for physical completion in early July. Next week, construction work is scheduled to begin to address vulnerabilities related to concrete shield walls located in the Pu-238 processing area.

Transuranic Waste Operations: This week, Area G management identified that construction work performed in support of high energy real time radiography (RTR) was conducted without electrical safety controls required by the Integrated Work Document (IWD). Because an electrical disconnect was open and locked out/tagged out, no personnel were exposed to hazardous energy during the construction activities. High energy RTR will provide LANL with the capability to adequately radiograph standard waste boxes that contain transuranic wastes in order to meet WIPP waste acceptance criteria.

The IWD that supports electrical and other construction activities identified the potential for the electrical hazard and required that a readily identifiable air-gap be in place to eliminate the hazard during this stage of construction activities. Recently, a separate LANL group was tasked with testing portions of the electrical system upstream from the tie-in to high energy RTR. In order to complete this testing, an upstream disconnect was opened and locked out/tagged out and the air gap was eliminated. However, this new configuration was not communicated to other construction personnel that were performing work under the IWD that required the air gap. Until this issue was identified earlier this week, high energy RTR construction activities were completed without the required air-gap. In addition, these construction workers did not have their own locks on the lock out/tag out that was providing hazardous energy protection as required by LANL procedures. High energy RTR construction activities are currently on hold because of this issue. Additional investigation of this event is planned to identify lessons learned and corrective actions.

Plutonium Facility – Safety Basis: LANL is currently in the process of conducting the final Implementation Verification Review (IVR) that covers Technical Safety Requirement (TSR) material-at-risk (MAR) controls. Notably, the team has questions with the configuration management and software quality assurance for the MAR tracker software that is used to perform the TSR surveillance in support of the MAR controls. The IVR team plans to outbrief the results of their review to facility and NNSA management next week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 3, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 3, 2011

Plutonium Facility – Safety Basis: Today, Plutonium Facility management declared the set of Technical Safety Requirements associated with the 2008 DSA to be fully implemented. This declaration concludes a two and a half year effort to implement the new modern control set and to perform a series of independent assessments to verify the adequacy of implementation.

Plutonium Facility – Seismic Safety: This week, LANL personnel issued final seismic analyses performed as part of the SAFER project that describe the performance of the Plutonium Facility structure and key safety systems under the increased seismic loading associated with the site's updated Probabilistic Seismic Hazards Analysis (PSHA). Results from these analyses are critically important to understanding the Plutonium Facility's seismic vulnerabilities and in defining the scope of upgrades necessary to address these vulnerabilities.

LANL management declared a Potential Inadequacy of the Safety Analysis (PISA) in late-April based on preliminary SAFER results for the facility structure that indicated the failure of some structural components is more likely than previously understood. A Justification for Continued Operations (JCO) covering these issues with the facility structure is scheduled to be submitted on June 6th. Newly completed analysis focused on the seismic performance of facility safety systems indicates that some credited systems may also fail more frequently in seismic events than previously thought. These results are being evaluated using LANL's New Information process to determine whether an additional PISA or PISAs are necessary.

Weapons Engineering Tritium Facility (WETF): On Friday, WETF management declared a PISA based on the lack of updated seismic analyses for the two exhaust stacks associated with the facility. In 2007, LANL completed the 10 year update of the PSHA that identified higher ground motions for laboratory facilities. A positive unreviewed safety question was declared for multiple facilities including WETF and a JCO was approved by NNSA. The SAFER project was initiated to review facility performance against the updated PSHA. In 2010, LANL completed the SAFER analysis and exited the JCO for all facilities except the Plutonium Facility. During recent development of the Hazard Analysis to support an updated DSA for WETF, questions about stack seismic performance were raised. Upon investigation, WETF management discovered that the stacks were not evaluated via SAFER even though seismically-induced collapse could damage the safety-credited building. WETF is currently not processing tritium pending implementation of controls identified in the JCO associated with the hot inlet system (site rep weekly 5/13/11). An evaluation of the safety of the situation for the stack issue will be completed prior to resuming tritium processing activities.

Radioactive Liquid Waste Treatment Facility Upgrade Project: Last week, LANL provided their recommendation to the NNSA site office on the path forward for the Radioactive Liquid Waste Treatment Facility Upgrade Project. The recommended path forward includes separating the transuranic and low level waste processes into individual structures with use of the previous design details to the extent possible. LANL also recommends that the project scope include low level daily influent storage by upgrading and using the WMRM tanks. The site office is reviewing the proposed path forward for the upgrade project.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 10, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 10, 2011

Pasko was onsite this week to attend an Integrated Nuclear Planning workshop devoted to the Plutonium Facility. The focus of the workshop, which included LANL, NNSA site office and NNSA-Headquarters personnel, included the results of the SAFER seismic evaluation, the 2011 Documented Safety Analysis (DSA) update and the plans and priorities for safety upgrades.

Plutonium Facility – Seismic Safety: This week, LANL management submitted for NNSA approval a Justification for Continued Operations (JCO) related to the recent discovery that certain structural components are more likely to fail during a seismic event than previously believed. Seismic analysis that supports the JCO concludes that the failure of one identified vulnerability could lead to a cascade of other failures resulting in significant structural damage that could impact material at risk (MAR) in all areas of the facility. Based on this low probability failure mechanism, the JCO conservatively postulates a more severe seismic accident scenario than any previously analyzed for the Plutonium Facility. This low probability, worst case scenario has very large dose consequences that are constrained only by significantly reduced facility MAR limits that are imposed by the JCO as compensatory measures. The JCO also credits a number of other compensatory measures that provide varying degrees of additional protection against seismic accident scenarios. NNSA site office and Headquarters personnel are currently reviewing the JCO.

In parallel with JCO development, LANL management has been aggressively pursuing design and construction efforts to implement structural upgrades to permanently address the newly identified vulnerabilities. LANL engineers, in conjunction with LANS corporate partner resources from Bechtel, have developed a design concept for an upgrade to correct the structural deficiency that leads to cascading failures and the severe accident scenario analyzed by the JCO. LANL personnel currently estimate that this critical upgrade can be completed by the end of November 2011.

Plutonium Facility – Safety Basis: Last week, LANL submitted the 2011 DSA annual update that includes the latest safety basis analysis of seismic accident scenarios for the Plutonium Facility. This refined seismic analysis assumes that the structural upgrades have addressed the recently identified vulnerabilities and restored facility's ability to provide a measure of material confinement after a seismic event. Once approved and implemented, the JCO discussed above will provide safety basis coverage until upgrades return the facility to the previously credited level of confinement performance. The 2011 DSA update is identified as an Implementation Plan deliverable for Recommendation 2009-2, *LANL Plutonium Facility Seismic Safety*. The site office is evaluating this submittal, although NNSA priority is currently on review of the JCO.

Transuranic Waste Facility (TRUWF) Project: LANL has completed approximately 90% of the preliminary design effort for the TRUWF Project and is scheduled to submit the Preliminary Safety Design Report to the NNSA site office later this month. This project will provide an enduring capability for transuranic waste storage, staging and characterization after Area G closure and shutdown of the WCRR Repackaging Facility. Currently, a technical independent project review is scheduled for September followed by Critical Decision-2, *Approval of Performance Baseline*.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 17, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 17, 2011

Federal Oversight: This week, the NNSA Site Office Manager announced the selection of a new Assistant Manager for Field Operations whose responsibilities include management of Facility Representatives, Safety System Oversight engineers, and the readiness program. The selectee is a former Facility Representative of the Year who had been serving at the Plutonium Facility.

Weapons Engineering Tritium Facility (WETF): WETF management declared a TSR violation this week based on the discovery of two rupture disks installed in the safety significant Tritium Gas Handling System (TGHS) that did not comply with the WETF Pressure Safety Program. The two rupture disks rated to actuate at 16 psid were located adjacent to a portion of the TGHS equipped with pressure protection devices rated to actuate at 38 psid. In this configuration, accumulation of gas in the adjacent section that exceeded 16 psid could actuate the rupture disks and back-flow gas into a now unprotected part of the system making it vulnerable to over-pressurization and failure.

The two affected rupture disks were installed prior to WETF fully implementing the requirements of LANL's conduct of engineering program. Using the less formal prior process, relevant Piping and Instrumentation Diagrams (P&IDs) were not updated to reflect the presence and rating of the newly installed rupture disks. When WETF engineers verified Pressure Safety Program compliance as part of their phased restart process, these rupture disks were not identified as a problem because they were not shown on P&IDs. Also, since this section of the TGHS was part of the lowest priority restart phase, associated components were not subjected to the enhanced verification measures applied to higher priority sections needed to support earlier startup phases.

In response to this discovery, WETF management has declared the TGHS inoperable pending modifications to bring the system into Pressure Safety Program compliance and has initiated an extent of condition review to identify any similar issues within credited pressure systems.

Plutonium Facility: LANL management has submitted for NNSA site office concurrence a recommendation to perform confirmatory analysis that compares the results of deterministic soil-structure interaction (SSI) analysis with the results of the probabilistic soil-structure interaction analysis that served as the basis for LANL's SAFER evaluation of the Plutonium Facility.

Radioactive Liquid Waste Treatment Facility (RLWTF): This week, RLWTF personnel used an upgraded rotary vacuum filter to transfer low-level waste sludge to a drum for disposition for the first time since 2007. Restoration of this drum-out capability will allow operators to begin removing large quantities of sludge from the low-level waste system that have accumulated over the years and prevented some key pieces of equipment from being operated as intended. RLWTF personnel are also making significant progress on replacing the failure-prone tubular ultrafilter system with more robust pressure filters. These upgrades will help improve the reliability and availability of the low-level waste processing system but do not reduce the need or urgency to construct a replacement facility. LANL and LASO continue deliberations on the path forward for the RLWTF-Upgrade project that is intended to provide this replacement capability.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 24, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 24, 2011

Plutonium Facility – Seismic Safety: Last week, LANL management submitted for NNSA site office approval an Evaluation of the Safety of the Situation (ESS) that addresses a positive Unreviewed Safety Question stemming from SAFER project results that show an increased probability of failure for safety significant systems and components in a seismic event. The previously submitted Justification for Continued Operations (JCO) that is currently under review by NNSA covers increased probabilities of failure for the safety class building structure and safety class systems and components. The ESS concludes that the increased likelihood of failures for safety significant systems and components does not increase the offsite consequences of bounding seismic accidents above those analyzed for building failures in the previously submitted JCO. The ESS does not propose any new compensatory measures; however, the ESS does commit to modify or upgrade affected systems and components to meet relevant seismic performance requirements, although the priority for resources will continue to be upgrades that focus on building structural integrity and confinement.

This week, Plutonium Facility Management declared a TSR violation based on a failure to comply with an operational restriction associated with the facility's cement silo appurtenance. SAFER project analysis concluded that if the silo is filled with cement above a certain level, it could fail in a seismic event and adversely impact the confinement integrity of the safety class building structure. In conjunction with JCO completion and submittal, Plutonium Facility management committed to implement an operational restriction to control the amount of cement in the silo to less than one-fourth capacity. To protect this operational restriction, operations personnel physically locked out a bucket hoist mechanism that they believed was the only means to add cement to the silo.

Roughly two weeks after the silo capacity operational restriction was declared, a delivery of cement ordered by programmatic personnel was received at the facility and added to the silo through a pneumatic fill tube that operations personnel were not aware of and was not locked out. The programmatic engineer who ordered the cement was cognizant of the silo capacity operational restriction and had calculated the size of the order to comply with the one-fourth capacity limitation. However, the programmatic engineer used the nominal density value for dry cement in his calculation and the process of transferring the material into the silo through the fill tube aerated the cement, lowering its density. As a result, the silo was found to be filled to nearly half capacity by the delivery. Facility personnel are planning an evolution to remove excess cement to restore compliance with the operational restriction.

Transuranic Waste Facility (TRUWF) Project: This week, LANL submitted a revision to the Safety Design Strategy to address changes in the TRUWF's design and safety strategy as the project approaches completion of preliminary design (Critical Decision-2 is planned for September). The revised strategy supports relocation of the facility from TA-52 to TA-63 to reduce the calculated frequency of design basis aircraft crashes. For the seismic accident scenarios, LANL continues to plan for Seismic Design Category-2 storage structures with a seismic switch to isolate power during a seismic event to prevent subsequent fires. The strategy also proposes vehicle barriers to protect the facility from external vehicle impacts. The Safety Design Strategy will be reviewed by the site office.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 1, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 1, 2011

The laboratory was closed this week due to the Las Conchas wildland fire. LANL declared an operational emergency on Monday, June 27th, and the Emergency Operations Center was activated and declared operational. Only one small (less than one acre) spot fire occurred on LANL property and was extinguished within one hour. All nuclear operations were suspended this week and nuclear facilities were placed in a safe-stable configuration with the exception of the Radioactive Liquid Waste Treatment Facility (RLWTF), which did perform low level waste processing operations this week to maximize lag storage space should an extended outage at RLWTF be required.

As of Friday, the Las Conchas fire has burned over 100,000 acres and is only 3% contained; however, the threat to LANL property and nuclear facilities has been significantly reduced by extensive firefighting efforts, preventative burns and fire breaks. During the week, LANL also performed extensive fire mitigation activities throughout the laboratory to reduce fuel sources (especially around Area G). Based on the reduction in threat to laboratory from the fire on Friday afternoon, LANL terminated the operational emergency and transitioned to recovery operations mode.

On Friday, the LANL emergency director approved the recovery plan that includes facility walkdowns (including the nuclear facilities) over the weekend by the Facility Operations Directors (FODs) to determine facility status and habitability. Restart of the laboratory will be phased over two days with management and programmatic walkdowns and restoration of site services on the first day. Provided there are no significant facility issues identified by the FOD or programmatic walkdowns, LANL will reopen to all personnel on the second day. Beginning the phased restart of the laboratory is dependent on repopulation of the Los Alamos town site.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 8, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 8, 2011

The laboratory re-opened on Wednesday after being shut down for more than a week due to the Las Conchas wildland fire. Last weekend, the Facility Operations Directors (FODs) conducted walkdowns to assess the status and habitability of LANL facilities. No significant issues were identified during these walkdowns. On Tuesday, a larger group of management and programmatic personnel conducted more detailed walkdowns of programmatic equipment and activities in advance of re-opening the laboratory. Other LANL personnel were onsite to restore key site services and support functions.

For the LANL nuclear facilities, restart of programmatic activities began on Wednesday following an all-hands briefing that emphasized safe, methodical resumption of work. As of Friday, there were no significant issues with nuclear facility restart activities.

Weapons Engineering Tritium Facility (WETF): This week, WETF personnel held a critique to discuss a situation involving the safety class Lightning Protection System (LPS) that was discovered before the Las Conchas fire. In March, craft personnel were performing maintenance work on the WETF roof. The Integrated Work Document (IWD) governing this activity allowed workers to remove certain kinds of roof hardware as part of this work. The IWD did not discuss removing roof-mounted air terminals associated with the safety class LPS and the negative Unreviewed Safety Question documentation for the IWD stated that the LPS would not be impacted.

During the course of the roof work, craft personnel realized that some air terminals would need to be removed in order to accomplish the task. The workers removed two air terminals, considering this to be work incidental to their maintenance task. On March 31st, this roof maintenance activity was paused to address an unrelated industrial hygiene question. When work was paused, the air terminals remained in the uninstalled configuration.

On June 18th, a WETF Duty Officer was on the roof to inspect ventilation equipment and noticed the uninstalled air terminals. Upon discovery of this condition, the LPS was declared inoperable. Subsequent evaluation by the Cognizant System Engineer and an LPS subject matter expert determined the system met National Fire Protection Association Standard 780 requirements, as credited in the TSR. Based on this evaluation, the LPS was declared operable, but impaired.

After the WETF Duty Officer noticed the air terminal modification, craft workers reinstalled the two affected air terminals. No new work control documentation was prepared to support this reinstallation evolution. WETF personnel are currently evaluating whether appropriate and pedigreed adhesive materials were used to perform this modification to the safety class LPS.

WETF management personnel are developing corrective actions to address the work control and work authorization issues evidenced by these events.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 15, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 15, 2011

Transuranic Waste Operations: Recently, LANL submitted updated Documented Safety Analysis (DSA) and Technical Safety Requirements (TSRs) documents for the WCRR Repackaging Facility to the NNSA site office for approval. Notably, the update increases the material-at-risk limit for the WCRR building from 300 combustible equivalent curies to 800 combustible equivalent curies to allow processing higher activity transuranic waste containers. Design basis accident scenarios have been updated, as appropriate, based on the higher material-at-risk limit.

As a part of the WCRR safety improvements that occurred late last year, a fire suppression system was installed in the waste characterization glovebox. The safety basis now credits this system as safety significant. Other significant changes in this submittal include clarification that the electrical distribution system is not a safety significant support system and removal of the transportainers and lightning protection system as safety design features. The specific administrative controls relative to transportainers usage and code requirements for inspection and maintenance of the lightning protection system remain. The site office is currently reviewing this submittal.

Plutonium Facility – Seismic Safety: Plutonium Facility personnel have completed physical installation work on steel support beams in glovebox exhaust ventilation plenum rooms in the facility basement. The newly installed beams address a structural vulnerability that could have caused roof members to fail and crush portions of the HEPA-filtered exhaust plena during a seismic event. Breaching the exhaust plena could have resulted in the creation of an unfiltered release path from the facility. The structural issue that the newly installed support beams are designed to address had one of the highest probabilities of failure of any vulnerability identified by the SAFER project.

Plutonium Facility personnel also plan to install seismic shut-off valves on natural gas lines that service support buildings around the periphery of the Plutonium Facility. Natural gas is not used in or plumbed into the Plutonium Facility itself. Among other buildings, the new seismic shutoff valves will be installed in the two redundant fire water pump houses that perform an important function as part of the safety class fire suppression system. The fire suppression system is currently credited for operational (i.e. non-seismically-induced) fires, but Plutonium Facility management intends to pursue upgrades to credit the system for seismically-induced fire scenarios as well. Adding seismic shutoff valves to natural gas lines in the pump houses will support this approach by reducing the likelihood of common cause earthquake failures rendering the safety class fire suppression system inoperable.

Additionally, this week LANL personnel removed a quantity of dry cement from the Plutonium Facility cement silo appurtenance. This evolution restores compliance with the TSR-level compensatory measure limiting the allowed amount of cement to one-fourth silo capacity. When at or below one-fourth capacity, the cement silo is not expected to fail in a seismic event and adversely impact the confinement boundary provided by the safety class Plutonium Facility building structure.

Radioactive Liquid Waste Treatment Facility: Facility personnel began work this week to install seismic shutoff valves to natural gas lines that service the Radioactive Liquid Waste Treatment Facility and the facility's treated effluent evaporator.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 22, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 22, 2011

Plutonium Facility: Late last week, the site office manager signed the Safety Evaluation Report (SER) that approves the Justification for Continued Operations (JCO) associated with the increased seismic risk identified by the SAFER analysis of the Plutonium Facility. LANL plans to complete structural upgrades to address these issues by the end of the calendar year. The SER includes six conditions of approval including a requirement to reevaluate seismic performance with the roof drag strut modification complete. An interim report is scheduled for September with a final report in December. This evaluation will determine whether additional upgrades are required.

Weapons Engineering Tritium Facility (WETF): This week, WETF management declared a TSR violation based on the discovery that TSR-level glovebox leak checks had been performed using uncalibrated equipment. WETF TSRs require gloveboxes to be leak tested after modifications or maintenance. The WETF implementing procedure for leak testing gloveboxes did not require the leak test to be performed using calibrated pressure transducers. WETF management is evaluating the extent of condition of this problem in response to this discovery.

Transuranic Waste Operations: Area G currently houses approximately 400 fiberglass-reinforced plywood boxes containing legacy transuranic waste that is too large to fit in drums or standard waste boxes. To remediate these boxes, LANL Waste Disposition Project personnel have been working to reconfigure the processing line in Building 412 at Area G that had originally been established to remove prohibited articles from low activity (i.e. less than 2.5 ²³⁹Pu-equivalent curies) transuranic debris waste drums. This week, after successful completion of a Management Self Assessment, LANL management authorized processing and size reduction of waste from boxes with contents whose activity does not exceed the DOE Standard 1027 Hazard Category 3 threshold (0.52 ²³⁹Pu-equivalent curies). On Thursday, Area G personnel processed the first in a campaign of 17 less than Hazard Category 3 boxes inside the Building 412 confinement tent. Upon completion of this campaign, LANL management will initiate a Contractor Readiness Assessment and NNSA Readiness Assessment to authorize box processing at the Hazard Category 3 level.

Work Planning and Control: This week, LANL began an assessment of the site's Integrated Safety Management (ISM) and Integrated Work Management Systems. The assessment is being shadowed and reviewed by site office and NNSA-Headquarters personnel. The criteria review and approach document includes criteria for each of the ISM five steps for performing work.

Chemistry and Metallurgy Research (CMR) Building: Recently, LANL submitted the 2011 update of the CMR Documented Safety Analysis (DSA) and associated Technical Safety Requirements. This update includes reduced material-at-risk limits that were previously captured as a standing order such that the offsite dose consequence for bounding postulated accident scenarios are below the evaluation guideline. In addition, the submittal addresses several conditions of approval and comments previously identified by the site office. The site office is currently reviewing the updated DSA and TSR submittal.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 29, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 29, 2011

Weapons Engineering Tritium Facility (WETF): For roughly nine months, WETF personnel have been working to develop and implement new TSR-level controls to address deflagration hazards resulting from the discovery that low levels of oxygen were leaking into a portion of the safety significant Tritium Gas Handling System. If not properly controlled, this oxygen could mix with hydrogen isotopes to create a potentially flammable atmosphere inside the system. After verifying successful implementation of a Justification for Continued Operations that included a number of additional controls, WETF personnel resumed programmatic gas handling operations this week.

Chemistry and Metallurgy Research Building (CMR): This week, CMR management declared two TSR violations based on the discovery that several recent TSR-level surveillances of the fire suppression system had failed to recognize readings that did not meet limiting conditions for operation and failed to initiate required response actions. At CMR, fire water risers associated with the safety significant fire suppression system are required to maintain pressures above certain values and riser pressure surveillances are performed weekly. This week, a team of safety system oversight engineers from the NNSA site office began an assessment of the CMR fire suppression system.

As part of the assessment, the NNSA team reviewed completed surveillance documentation and discovered that in one recent case pressure readings for two separate risers were less than pressure values required by the TSR, but were not identified as unsatisfactory results that would trigger required response actions such as initiating a fire watch. In response to the NNSA discovery, CMR personnel did a more exhaustive review of completed fire suppression system surveillance documentation and found another instance where recorded riser pressure values did not meet TSR limiting conditions for operation, but were not recognized and handled appropriately. Facility management is developing corrective actions to address the issues that led to these violations.

Federal Oversight: Last week, the NNSA site office formally transmitted to LANL a report documenting the results of an assessment of the laboratory's Cognizant System Engineer (CSE) program. DOE Order 420.1B, *Facility Safety*, establishes the requirements for a CSE program and stipulates that a CSE must be assigned to at least every active safety class and safety significant system in a nuclear facility to ensure these systems maintain their operational readiness and the ability to perform their credited safety functions. The site office assessment concluded that the LANL CSE program is not fully compliant with DOE requirements. One particularly notable assessment finding stated that the majority of qualified LANL CSEs are not knowledgeable of key safety basis parameters for their systems, including functional classifications, functional requirements and performance criteria.

In the course of their assessments, NNSA safety system oversight engineers continue to routinely discover Potential Inadequacies of the Safety Analysis and TSR violations that have not been identified by laboratory personnel (the most recent example related to CMR is discussed above). Strengthening LANL CSEs knowledge and understanding of nuclear safety bases and the critical nexus between the safety basis and their assigned system appears to be a key step to improving LANL's ability to self-identify PISAs and prevent TSR violations moving forward.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 5, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 5, 2011

Verhaagen was onsite this week to observe an ongoing LANL work control assessment.

Material Disposal Area (MDA)-B: LANL personnel are approximately 98% complete excavating the buried contents of MDA-B, which was used from 1944-1948 as a landfill for waste contaminated with radioactive material. Excavation activities performed within HEPA-filtered enclosures were originally authorized as less than hazard category 3 operations (per DOE-STD-1027) that were not subject to the safety basis requirements of Title 10 Code of Federal Regulations, Part 830 (10 CFR 830), *Nuclear Safety Management*, Subpart B. In two separate instances in late 2010, MDA-B operations excavated waste material whose total activity exceeded the hazard category 3 threshold of 0.52 ²³⁹Pu-equivlent curies (PE-Ci). Based on these events, future excavation of hazard category 3 quantities of waste material became anticipated. At the hazard category 3 level, MDA-B operations would be subject to the requirements of 10 CFR 830 Subpart B, including the requirement to perform work under a Documented Safety Analysis.

In response, the Los Alamos Site Office (LASO) requested, and NNSA Headquarters (NA-10) approved, an exemption from the requirements of 10 CFR 830 Subpart B for MDA-B. In approving the exemption, NNSA imposed a number of terms and conditions, including provisions requiring MDA-B operations to be conducted in accordance with a Facility Safety Plan (FSP) and requiring LASO to concur in any changes to the FSP or implementing procedures that affect the safety envelop at MDA-B. To comply with these conditions, MDA-B management implemented an Unreviewed Safety Question (USQ)-like process to determine which changes could affect the safety envelop. MDA-B operations resumed under the 10 CFR 830 exemption in October 2010.

After waste is excavated and loaded into bins inside MDA-B enclosures, the waste bins must be weighed to establish an accurate value of material-at-risk (MAR) for facility inventory purposes. Scales used to weigh waste bins were located approximately 90 feet outside the LANL-designated boundary of MDA-B. On a number of occasions since October 2010, waste bins containing greater than 0.52 PE-Ci, were transferred from MDA-B to these scales to be weighed. The LASO-concurred FSP mentions the scales but does not discuss their location or weighing operations.

On July 25th, a LASO facility representative recognized that greater than hazard category 3-quantities of material were being transferred outside of the MDA-B boundary to be weighed and questioned the safety basis coverage for these activities. The NNSA-approval of the 10 CFR 830 exemption is specific to MDA-B, but the boundary of MDA-B is configuration controlled by LANL. On July 28th, facility management used the LASO-concurred USQ-like process to evaluate a boundary change that expanded the MDA-B footprint to include the scales. The USQ-like evaluation concluded that the boundary change did not affect the safety envelop and therefore did not require LASO concurrence. The new MDA-B boundary that includes the scales went into effect on Monday. At LASO management's request, LANL is documenting a position on the safety basis coverage and 10 CFR 830-compliance of scale operations that had been conducted prior to the MDA-B boundary change. This position will be submitted for NNSA review.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 12, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 12, 2011

Transuranic Waste Operations – WCRR Repackaging Facility: This week, LANL personnel recognized that waste processing operations have occurred for several weeks despite expiration of a Safety Evaluation Report (SER) approval of an Evaluation of the Safety of the Situation (ESS). On Thursday, the site office extended the SER approval to September 2nd to resolve this issue. In March 2011, LANL declared a Potential Inadequacy of the Safety Analysis because a Specific Administrative Control that prohibits staging or processing waste in the glovebox enclosure was not carried forward into the Technical Safety Requirements (TSRs). The control was implemented by standing order pending update and implementation of revised TSRs. In the March site office approval of the ESS, a condition of approval was identified that required LANL to submit safety basis and TSR page changes within 60 days. In addition, the SER identified that it would expire 90 days after approval (June 28th). LANL submitted the page changes in June but not within 60 days as required by the SER. The facility also continued to perform transuranic waste processing after the SER expired. This issue was complicated by the Las Conchas fire that started on June 26th and resulted in a laboratory shutdown for over a week.

Transuranic Waste Operations – Area G: The site office approved safety basis page changes last week that support operation of high energy real-time radiography at Area G. This operation provides characterization capability to support shipment of additional waste container types to WIPP. Because of previous readiness and startup issues at Area G, LANL management has decided to use outside personnel to review and ensure facility readiness prior to performing a management self assessment. The site office approval also requests LANL to provide a technical basis for concluding that the worker radiography hazard is a standard industrial hazard.

Plutonium Facility – Seismic Safety: Recently, LANL submitted a revision to the Justification for Continued Operations (JCO) associated with the increased seismic risk identified by the SAFER analysis of the Plutonium Facility. This revision resolves several site office conditions of approval including a requirement to identify TSR level controls for the marine doors that are credited to reduce the potential for an unfiltered release path following a seismic event. The JCO now includes a material at risk limit (MAR) for the glovebox line directly beneath roof girder drag strut (one of identified seismic vulnerabilities). A biweekly surveillance for this MAR limit will be implemented for this control. Facility upgrades to resolve the currently identified seismic vulnerabilities are ongoing and scheduled to be complete by the end of the calendar year.

Transuranic Waste Operations – RANT Repackaging Facility: Last week, the site office provided the SER approval to LANL for an updated safety basis and TSRs. This revision of the safety basis resolves several conditions of approval from the previous safety basis including re-analysis of the aircraft crash accident scenario, which now has a frequency of less than 1e-6/year. Implementation of the revised safety basis is scheduled to complete within 90 days. Because RANT is now considered an enduring facility, the site office has requested the next update to be a DOE-STD-3009 compliant documented safety analysis (previous safety basis analysis was in the form of a basis for interim operations).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 19, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 19, 2011

This week, Board members Peter Winokur, Jessie Roberson, Joseph Bader and John Mansfield were onsite along with staff members Timothy Dwyer, Matthew Moury and John Pasko to meet with NNSA site office and LANL personnel. The Board members also toured transuranic waste operations at Area G and seismic upgrades at the Plutonium Facility.

Plutonium Facility – Criticality Safety: A criticality safety infraction was declared last Thursday when a plutonium overmass condition was identified in a facility glovebox. In order to take pictures of several cast plutonium items in a glovebox, a plutonium worker removed the items from two separate slip lid containers in two different mass locations. The worker then collocated all of the items to take a picture. This resulted in a total mass that exceeded the criticality safety limit. An angle iron spacing delimiter that is a criticality safety engineered feature was also moved from its required location and used to prop up the items for the photographs.

A second plutonium worker entered the area and recognized the overmass condition. The first worker then moved the items back to their original location. This action is not consistent with criticality safety expectations and procedures, which require workers to back off and contact criticality safety personnel. Workers in the lab room were notified of the issue and the room was evacuated and facility management was notified. Subsequent evaluation by criticality safety personnel concluded that the current position of the items (i.e. after the worker returned the items to the separate locations inside slip lid containers) was safe and consistent with criticality safety requirements.

During the subsequent critique, additional issues with regard to the process for authorizing work (the glovebox owner was not aware of the activity) and timely and complete notifications were identified. Recognizing the significance of this event, Plutonium Science and Manufacturing Directorate management plan to pause work on Monday morning to conduct an all-hands briefing followed by breakout sessions at the group level to discuss the briefing and lessons learned. The brief will focus on conduct of operations, criticality safety requirements, work authorization and lessons learned from this and other criticality safety issues. Management will authorize individual group activities to resume after this training is complete. All Plutonium Facility personnel will be required to complete this training prior to being authorized to perform work.

Transuranic Waste Operations: In late July, an institutional Facility Centered Assessment (FCA) team issued a final report documenting their review of facility and programmatic operations at Waste Disposition Project (WDP) nuclear facilities – Area G, RANT, and WCRR. This independent assessment covered a broad range of functional areas and safety management programs and was conducted by representatives from LANL, NNSA's Los Alamos Site Office, and DOE's Office of Health, Safety and Security. The FCA report concludes that WDP nuclear operations are significantly non-compliant with requirements in the following functional areas: safety basis, engineering (particularly configuration management), fire protection, criticality safety, emergency preparedness, quality assurance, and management systems. LANL line management organizations have accepted the findings and are developing corrective actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 26, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 26, 2011

Weapons Engineering Tritium Facility (WETF): WETF Technical Safety Requirements (TSR) credit a containerization program that has specific provisions governing the labeling and allowed storage locations for containers that could exceed their rated design pressures under fire conditions. Pressure requirement compliance for individual tritium-bearing containers is tracked using a controlled spreadsheet that was designed to update container pressure conditions over time. This week, a WETF subject matter expert (SME) was reviewing the spreadsheet and recognized that a container known to exceed pressure requirements was now reflected as compliant. In investigating this situation, the SME identified an error in the spreadsheet algorithm used to calculate internal container pressure as a function of time. This error underestimated the amount of helium in-growth from tritium decay in a way that caused calculated container pressures to decrease rather than increase over time. Upon discovery of this issue, WETF personnel are systematically reassessing the pressure conditions of each tritium container in the facility. The extent of condition review continues. To date, one container has been newly identified as non-compliant with TSR containerization program requirements. As a result, WETF management declared a TSR violation.

Also this week, WETF personnel conducted an emergency exercise where an exercise controller fed simulated alarms into the WETF Integrated Control System in accordance with an Exercise Plan that had been approved and evaluated through the Unreviewed Safety Question process. All qualified WETF operations center operators evacuated the facility in response to simulated alarms. During the exercise-prompted evacuation, an actual high oxygen level alarm for the Tritium Waste Treatment System (TWTS) was received by the exercise controllers who remained in the facility. Receipt of a valid alarm was relayed to evacuated personnel and the exercise was suspended. However, before qualified personnel could return to the operations center, the unqualified operators observed conditions that they felt warranted action to introduce inert gas into the TWTS to dilute the oxygen concentration. After the unqualified personnel manipulated the system to initiate the dilution, qualified operators returned and oxygen levels fell and remained below alarm levels. In addition to evaluating issues related to unqualified personnel operating credited safety systems, WETF management is investigating both the cause and the safety basis implications of the unexpected influx of oxygen into the TWTS.

In response to these events, WETF management suspended container movements and gas handling operations, pending further investigation. The facility has been placed in Warm Standby mode.

Transuranic Waste Operations: This week, Area G management declared a TSR violation based on a failure to comply with minimum staffing requirements during transuranic waste operations. Area G TSRs require two technicians and a radiological control technician to be present when operations involving transuranic waste containers are performed inside waste storage domes. Recently, an NNSA facility representative observed a forklift operator transfer a standard waste box containing transuranic waste from one storage dome location to another without the required second operator. Area G management declared a TSR violation based on this facility representative observation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 2, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 2, 2011

Plutonium Facility: This week, LANL self-identified that a quarterly Technical Safety Requirement (TSR) surveillance for Pu-238 material-at-risk (MAR) was not performed within the required period (the surveillance should have been performed by August 13th). Facility personnel successfully completed the MAR surveillance on Thursday and verified that material inventory in the laboratory was within limits.

This TSR surveillance was one of the last controls implemented in early June to complete full implementation of the 2008 Documented Safety Analysis and associated TSRs. A Plutonium Facility worker performed the surveillance on June 2nd using an approved procedure; however, MAR inventory data from May 13th was used instead of the current inventory data called for by procedure. The facility surveillance tracking database in the operations center was tracking this quarterly surveillance based on the June date versus the May date. This week, facility personnel questioned the required time to perform the MAR surveillance, identified the discrepancy and reported the TSR violation. LANL investigation and development of corrective actions are ongoing.

Safety Basis: Last week, the site office provided direction to LANL on the processes used to manage safety system deficiencies. In particular, LASO requested the following actions within 30 days: 1) implement detailed requirements for declaring and reporting TSR violations; 2) update the New Information Process based on site office comments; 3) provide process flow charts that clarify the relations between the nonconformance reporting, new information and operability determination procedures (including draft changes to procedures, as needed); and 4) identify required training to implement these changes. When implemented, these changes should help clarify and improve site processes used to manage and resolve safety system deficiencies.

Work Planning and Control: Recently, the site office provided feedback to NNSA-Headquarters on the proposed standard for work planning and control developed by the Energy Facility Contractors Group. LASO asserts that the standard "...could be an appropriate guide or manual for maintenance work but should not be a required standard, particularly for the wide ranging research and development (R&D) and high-skill programmatic work that is the focus of [LANL's] national security and other scientific missions." LASO recommends that the standard be used as a non-mandatory guide for capturing best practices.

Transuranic Waste Operations: An unvented legacy container that holds a 0.5 g ²⁴¹Am source received from the Lovelace Respiratory Research Institute is currently staged at Area G inside a vented Standard Waste Box. LANL personnel intend to use a glovebag inside the Dome 231 Sort, Segregate, and Size Reduction (SSSR) permacon to open the legacy container and remove the ²⁴¹Am source for disposition. This week, the NNSA site office approved a one-time exemption to an Area G specific administrative control that normally prohibits opening unvented containers during SSSR operations. The exemption approval includes a number of compensatory measures to control hazards presented by hydrogen accumulation in the legacy container. LANL must also successfully complete a contractor readiness assessment, currently scheduled for September, prior to performing this work.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 9, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 9, 2011

Weapons Engineering Tritium Facility (WETF): At WETF, the safety significant tritium monitoring system is credited to detect high tritium concentrations and provide a local alarm to prompt worker evacuation. Last week, four tritium monitors that had recently been recalibrated at the LANL Calibration Laboratory had their TSR-level surveillances performed to confirm operability upon reinstallation. A step in the WETF surveillance procedure requires a qualified operator to verify the tritium high level alarm to be set at $7,000 \mu\text{Ci}/\text{m}^3$. The procedure then calls for the operator to verify that the high level audible alarm sounds at a tritium concentration less than $10,000 \mu\text{Ci}/\text{m}^3$, which is a TSR requirement. A qualified WETF operator performed the surveillance procedure and initialed completion of the set point verification and the audible alarm confirmation steps. During the course of testing, operations center personnel noticed unanticipated system responses and called in the Cognizant System Engineer (CSE) to investigate. The CSE discovered that although the TSR surveillance had been completed and documented as satisfactory, the tritium monitor set point had never been changed from the Calibration Laboratory default setting of $99,000 \mu\text{Ci}/\text{m}^3$, as required by the surveillance procedure, and therefore could not have audibly alarmed at a level below $10,000 \mu\text{Ci}/\text{m}^3$, as required by the TSRs. Upon discovery, WETF management entered applicable action statements for the tritium monitoring system Limiting Conditions for Operation (LCO), fixed the tritium monitor set point issue, and successfully re-performed the TSR surveillances. WETF management has taken other actions to address the significant procedure compliance issues associated with this event.

Plutonium Facility: This week, the site office completed a Safety Evaluation Report for a revised Justification for Continued Operation (JCO) associated with handling and storage of heat-source plutonium (HS-Pu) material containers. This revised JCO addresses three Potential Inadequacies of the Safety Analysis (PISAs) that were identified for HS-Pu between November 2010 and January 2011. The site office response also approves removal of previously identified operational restrictions following implementation of the revised JCO controls. The JCO identifies a specific administrative control implemented as a LCO that requires welded HS-Pu containers inside gloveboxes to meet the performance criteria at the glovebox fire temperature of 1800°F or have a limited time (two weeks) to be present in the glovebox (and count toward the applicable glovebox material at risk limits). The JCO is scheduled for implementation within 90 days.

Plutonium Facility – Seismic Safety: Recently, the site office submitted to NNSA-Headquarters the Project Execution Plan that includes strategy, cost, scope, schedule and identified funding sources to complete upgrades that ensure mitigated consequences for worst case seismic accident scenarios do not challenge the offsite evaluation guideline. This submittal is identified as a deliverable for Recommendation 2009-2. The plan includes the following: 1) upgrades to address deficiencies identified in the SAFER evaluation to meet facility performance assumptions 2) credit analyzed and approved fire-rated containers with reduced damage ratios 3) upgrade glovebox support stands to meet PC-3 requirements for gloveboxes that process plutonium in the molten state 4) upgrade the fire suppression system to meet PC-3 requirements and 5) upgrade appropriate portions of the ventilation and support systems to meet safety-class and PC-3 requirements.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 23, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 23, 2011

Federal Oversight: Last week, the NNSA site office transmitted a series of letters to LANL that call for corrective actions in response to recent operational events and assessment results. The letters focus on issues related to criticality safety and conduct of operations at the Plutonium Facility, as well as, safety system and safety management program efficacy concerns at transuranic solid waste facilities (Area G, RANT, and WCRR). Collectively, the letters prompt LANL to take immediate actions to: • evaluate the adequacy and implementation of criticality safety controls for certain Plutonium Facility operations that rely heavily on conduct of operations to maintain criticality safety margin; • evaluate vital safety system operability concerns at transuranic solid waste facilities; and • evaluate whether safety management programs at the Plutonium Facility and transuranic solid waste facilities require compensatory measures. Longer-term, the letters call for LANL to examine the issues associated with the Plutonium Facility and transuranic solid waste facilities, determine causal factors, evaluate extent-of-condition across the site, and develop a comprehensive corrective action plan. The letters also drive LANL to develop a suite of performance metrics and leading indicators that can be used jointly by LANL and NNSA to track improvements in nuclear operations.

Plutonium Facility: In response to the NNSA site office correspondence discussed above, this week Plutonium Facility management suspended selected operations, pending review of the adequacy and implementation of criticality safety controls. One affected operation involves nitric acid-based plutonium recovery and purification. Close evaluation of this process based on NNSA concerns highlighted the fact that it is physically possible to transfer plutonium-bearing solutions from process tanks, through piping, into a bulk nitric acid tank that resides outside the Plutonium Facility's credited confinement boundary. This situation presents both safety basis and criticality safety concerns and prompted Plutonium Facility management to declare a Potential Inadequacy of the Safety Analysis.

Las Conchas Wildfire: Last week, the site office transmitted the Las Conchas Wildfire Final Emergency Report to NNSA-Headquarters consistent with the requirements in DOE Order 151.1C, *Comprehensive Emergency Management System*. The fire began on Sunday, June 26th at approximately 1300 roughly 12 miles southwest of LANL. An Operational Emergency was declared on Monday, June 27th due to a small (approximately 1 acre) fire on laboratory property that was quickly extinguished. LANL transitioned from an Operational Emergency to recovery mode on Friday, July 1st after the threat from the fire had been sufficiently mitigated.

As a noteworthy practice, the report identifies lessons learned and corrective actions developed after the 2000 Cerro Grande fire that included execution of a wildland fire management plan, construction of a new Emergency Operations Center (EOC), formalized training of Emergency Response Organization personnel, establishment of a 24/7 Emergency Operations Support Center and development of an enhanced drill and exercise program. The report identified opportunities for improvement in the areas of communication, management and staffing, EOC infrastructure, access control and accountability. The site office also reviewed the event and identified opportunities for improvement associated with LASO and DOE-Headquarters performance. The site office is developing a performance-based incentive for FY12 to drive improvements in the identified areas.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 30, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 30, 2011

Broderick was out of the office this week.

Plutonium Facility – Seismic Safety: This week, NNSA-Headquarters formally submitted the Project Execution Plan for structure, system and component upgrades to ensure worst-case accident scenario consequences do not exceed the DOE evaluation guideline. The plan is identified as a deliverable for Recommendation 2009-2, *LANL Plutonium Facility Seismic Safety*, and includes the initial strategy, cost, scope, schedule and funding sources for the proposed upgrades. A key proposed upgrade, safety-class, performance category-3 active confinement ventilation has a current schedule for completion in fiscal year 2020; however, the forwarding letter notes that NNSA is reviewing this project to determine if the schedule can be accelerated. NNSA also commits to updating the Project Execution Plan in January to include any additional input from the Plutonium Facility Seismic Analysis of Facilities and Evaluation of Risk (SAFER) analyses. Based in part on input from the Board staff, LANL is currently evaluating the impact from the facility service chase roof cold joint and the performance of corridor columns after other upgrades are completed. These evaluations may identify the need for additional facility upgrades to address worst-case seismic accident scenarios.

As a part of the Justification for Continued Operation associated with the increase in seismic risk identified by the SAFER project, LANL included a compensatory measure to containerize a significant quantity of heat source-plutonium (HS-Pu) into safety-class fuel storage outer containers. This week, LANL reported to the site office that 1.2 kg of HS-Pu from the laboratory floor has been packaged in safety-class containers. Because of the high specific activity for HS-Pu, this represents a significant quantity of plutonium-239 equivalent material.

Safety Basis: Recently, LANL responded to site office direction on management of safety system deficiencies related to declaring Technical Safety Requirement (TSR) violations, the new information process, the non-conformance report process, integration of these procedures and required training. With input from the site office, LANL has developed a standing order that defines the conditions for declaring a TSR violation. This definition will be incorporated into safety basis documents as part of the annual update process. In addition, the NI and NCR procedures have been revised to address site office comments and ensure process integration. LANL plans to perform a training needs analysis to determine appropriate training content, target audience and best method to deliver training material to the target audiences.

Formality of Operations: Earlier in September, LANL responded to a July 2011 NNSA-Headquarters request to analyze the site's issues and weaknesses in formality of operations, identify common contributing factors and corrective actions and describe "best in class" practices in this area. The site office response notes that while formality of operations procedures adequately address DOE requirements, uniform and compliant implementation of these procedures and processes remain a problem at LANL as evidenced by facility centered assessments, readiness review results and site office oversight activities. Specific issues that need to be addressed are identified for conduct of operations, engineering, maintenance and training. The site office notes that LANL continues their "maturation" of formality of operations; however, full compliance is expected to take several more years to complete.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 7, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 7, 2011

Weapons Engineering Tritium Facility (WETF): This week, LANL submitted to the NNSA site office an Evaluation of the Safety of the Situation and revised Justification for Continued Operation (JCO) to address hazards and controls associated with the potential for oxygen in-leakage into WETF tritium systems. In October 2010, LANL identified an unreviewed safety question associated with potential oxygen in-leakage through the Hot Inlet System. A hazard analysis was performed to evaluate deflagration hazards due to oxygen in-leakage and a JCO was submitted and approved by the site office. Subsequently, during an emergency exercise in August 2011, an increase in oxygen concentration in the Tritium Waste Treatment System (TWTS) was noted after repositioning a three-way valve. In response, the three-way valve was returned to its previous position and the system was purged, which reduced the oxygen concentration. Facility operations were also placed in warm standby and restrictions on introduction of flammable gases into tritium systems were implemented by standing order. This issue was declared an unreviewed safety question due to the potential increase in frequency for oxygen in-leakage into the TWTS.

The revised JCO, which is based on a new hazard analysis, identifies additional controls including blanking off the connection from the TWTS to the three-way valve discussed above. LANL contends that the newly identified controls along with previous JCO controls ensure the facility can be operated safely and requests approval of the JCO until January 30, 2012. The site office review is ongoing.

Plutonium Facility – Seismic Safety: LANL reported to the site office this week completion of several key upgrades that address seismic/structural issues identified by the Seismic Analysis of Facilities and Evaluation of Risk project. These upgrades included the Zone 1 plenum column to wall and column to ceiling separation and the Zone 1 fan pad modifications. These improvements help reduce the potential for an unfiltered release during and following a seismic event.

Transuranic Waste Operations: This week, a LANL team completed a checklist Contractor Readiness Assessment (CRA) of high energy real-time radiography (RTR) operations at Area G. The startup of high energy RTR operations is necessary for LANL to certify that transuranic waste directly loaded into Standard Waste Boxes meets the waste acceptance criteria specified by the Waste Isolation Pilot Plant. At the outbrief, the CRA team leader noted that the high energy RTR operations reviewed during this CRA demonstrated a higher degree of readiness than other recently reviewed transuranic waste startup activities. This conclusion indicates that steps taken by LANL management to improve the preparation and state of readiness for transuranic waste-related startups are having a positive effect.

The CRA team did identify three pre-start findings. One of these pre-start findings reflects a damage ratio value used in the approved safety analysis that is a factor of ten lower than the value dictated by DOE-STD-5506, *Preparation of Safety Basis Documents for Transuranic Waste Facilities*. Since dose consequences are linearly proportional to damage ratios, using a damage ratio value that is consistent with DOE-STD-5506 would increase the consequences from postulated accident scenarios by an order of magnitude. LANL management intends submit a safety basis page change to the NNSA site office for approval to address this issue prior to beginning high energy RTR operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 14, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 14, 2011

Plutonium Facility: This week, the NNSA site office approved revision 1 of the 2011 Plutonium Facility Document Safety Analysis (DSA) and its associated Technical Safety Requirements (TSR). This is the first major Plutonium Facility DSA update to be approved by NNSA since December 2008. The approved DSA presents mitigated doses that are below the DOE Evaluation Guideline for all postulated accident scenarios, including the bounding seismically-induced fire scenario. The approved DSA also addresses NNSA comments generated during prior reviews of the never-approved 2009, 2010, and 2011 revision 0 DSA annual update packages. The NNSA approval letter requests for LANL to provide an implementation plan for the updated set of TSRs within 30 days.

The approved update includes a completely revised accident analysis for the bounding seismically-induced fire scenario. The reanalyzed scenario in the 2011 DSA is significantly different from the 2008 DSA seismically-induced fire scenario in a number of respects. First, the 2011 DSA provides a basis to assume that post-seismic fires will be confined to four laboratory rooms rather than using the 2008 DSA assumption that a post-seismic fire would engulf the entire laboratory floor. This collection of four smaller fires provides less energy to drive released material out of the building than a large floor-wide fire, resulting in a leak path factor of 0.18 in the 2011 DSA down from 0.40 in the 2008 DSA. The 2011 DSA also limits the total amount of material at risk (MAR) allowed on the laboratory floor to approximately 50% of that allowed by the 2008 DSA. Finally, unlike the 2008 DSA that assumed all MAR was present in a single extremely dispersible form, the 2011 DSA disaggregates the MAR based on the various physical forms of material that are actually found in the facility and assigned dispersibility values based on each specific form. The aggregate effect of reduced MAR, dispersibility (i.e. airborne release fractions and respirable fractions), and leak path factor values result in a mitigated offsite consequence for the seismically-induced fire in the 2011 DSA that is below the DOE Evaluation Guideline and is two orders of magnitude lower than the 2008 DSA consequence.

Importantly, the revised seismic accident analysis in the 2011 DSA assumes that an earthquake does not cause the facility to collapse and does not breach the confinement integrity of the building structure. In April, results of the SAFER seismic analysis for the Plutonium Facility identified a number of structural vulnerabilities that could cause facility collapse or loss of confinement integrity in the event of an evaluation basis earthquake. This new information prompted the development and approval of a Justification for Continued Operation (JCO). This JCO remains in force while NNSA and LANL aggressively pursue structural upgrades to address the identified vulnerabilities. One key upgrade milestone occurred last weekend as concrete was placed to form a heavily reinforced strengthening member on the Plutonium Facility roof to address the one currently known vulnerability that could lead to facility collapse in a severe earthquake. This week, Plutonium Facility management also completed formal implementation of all compensatory measures included in the seismic JCO after performing and resolving issues from an independent Implementation Verification Review.

Presently, the 2008 DSA, its associated TSRs, and the seismic JCO remain the Plutonium Facility safety basis of record. The 2011 DSA and TSRs can be implemented to supersede the 2008 documents, but some version of a seismic JCO must remain in place until the seismic performance of credited controls (e.g. no building collapse or confinement breach) conforms to assumptions made in the DSA.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 21, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 21, 2011

This week, staff members T. Cutler, J. Deplitch, M. Helfrich and J. Pasko were onsite to review the LANL emergency management program.

Material Disposal Area-B (MDA-B): In September, LANL completed the retrieval of waste buried at MDA-B, a six acre legacy waste disposal area that received radiological and chemical waste in the late-1940s and is only meters away from public areas. At present, approximately 85% of the 116 plutonium-239 equivalent curies (PE-Ci) that were retrieved have been shipped away from MDA-B for disposal. The shipment of all remaining excavated waste from MDA-B is currently scheduled to be complete in early 2012. Permanent removal of this legacy waste, which included significantly more radioactive material inventory and total waste volume than anticipated, will represent a significant achievement in reducing the hazards at Technical Area-21.

LANL also recently submitted the safety basis strategy for retrieval of sludge waste from the two "General's Tanks" located in Material Disposal Area-A in Technical Area-21. Sample results obtained recently indicate approximately 150 PE-Ci are contained in these tanks. The strategy notes that sludge removal from the General's Tanks will be conducted as a hazard category 2 nuclear activity using a Documented Safety Analysis and Technical Safety Requirements developed in accordance with DOE-STD-1120, which is a 10 CFR 830 safe harbor methodology for developing safety basis documentation for environmental restoration activities.

Transuranic Waste Operations: Laboratory personnel plan to use a glovebag inside of a permacon structure located at Area G to access a legacy Am-241 source and either retrieve it for future programmatic use or package it for disposal as transuranic waste. Historically, this source had been used for experiments at the Lovelace Respiratory Research Institute. Available assay data indicates the source contains approximately 0.56g of Am-241 which represents 1.7 PE-Ci (about three times greater than the hazard category 3 threshold of 0.56 PE-Ci found in DOE-STD-1027).

The Am-241 was originally contained in a glass ampoule that was placed inside a copper-shielded steel box. The integrity of the glass ampoule is now suspect and LANL personnel are planning for the presence of dispersible americium oxide based on a continuous air monitor alarm received the last time the box was opened in 2007 at a Sandia National Laboratories – Albuquerque facility. The steel box containing the americium source is currently overpacked inside a Standard Waste Box (SWB) and staged in a transportainer at Area G. Lab personnel plan to transport the SWB to a permacon structure in Area G, remove the steel box and insert it into a glovebag inside the permacon, open the steel box the access the americium source, and either package the material for shipment to the Plutonium Facility if the source is recoverable or package the material for disposal as transuranic waste if the source is not recoverable.

This week, a LANL review team issued their final report documenting completion of a checklist Contractor Readiness Assessment (CRA) for this activity. The report identifies four pre-start findings. Lab personnel plan to perform this evolution upon successful resolution of these findings.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 28, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 28, 2011

Mr. Broderick was out of the office this week.

Transuranic Waste Operations – Area G: On Tuesday, LANL waste personnel successfully repackaged the americium-241 item received from Sandia National Laboratories – Albuquerque (see last week’s report). After opening the copper-shielded steel box, LANL personnel identified contaminated lead and plastic but not the americium-241 item that was expected. The contaminated materials including the glovebag used for this operation were collapsed and packaged in a standard waste box for disposition as transuranic waste.

In July, LANL began processing fiberglass-reinforced plywood boxes containing legacy transuranic wastes that are too large to fit in drums or standard waste boxes. This operation is being performed in the waste processing line in Building 412 at Area G. To date, 17 boxes that contain less than Hazard Category 3 threshold material (0.52 plutonium-239 equivalent curies) have been processed. An additional approximately 400 boxes remain that exceed the Hazard Category 3 threshold and need to be repackaged prior to shipment to WIPP.

This week, waste disposition project personnel completed line management activities to support startup for the higher activity boxes. The site office also approved the Plan of Action for the initial startup of this operation. A contractor readiness assessment is scheduled to begin next week followed by a federal readiness review in November. Lessons learned and operator training from processing operations with the less contaminated boxes has been used to help ensure readiness to process the higher activity waste boxes.

Transuranic Waste Operations – WCRR Repackaging Facility: Earlier this year, LANL submitted revised safety basis documents for the WCRR Repackaging Facility that support an increase in the material at risk limits from 300 to 800 combustible equivalent curies to allow processing higher activity transuranic waste containers. The submittal also clarified that the electrical distribution system is not a safety significant support system. Based on site office comments, the safety basis was resubmitted in September. This week, the site office provided an additional comment that identifies the need for the electrical distribution system to be safety significant. The site office letter notes that this system supports the safety significant confinement ventilation system and, therefore, should have the same safety classification.

Radioactive Liquid Waste Treatment Facility (RLWTF): Earlier this month, LANL submitted a safety basis strategy for completing a DOE standard 3009 compliant Documented Safety Analysis (DSA) and Technical Safety Requirements for the existing RLWTF. LANL had previously submitted a Basis for Interim Operation in December 2010; however, in July 2011 the site office directed development of a DSA because of the potential for delays in the replacement project. The strategy notes that approximately 18 months will be required to develop the new DSA for RLWTF. The facility is currently operating under a 1995 safety basis document with interim Technical Safety Requirements.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 4, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 4, 2011

Plutonium Facility – Seismic Safety: In October, LANL personnel installed a large strengthening member on the Plutonium Facility roof. This upgrade was significant because it was designed to address the one known structural vulnerability whose failure could have caused the facility to collapse in a large earthquake. A key aspect of post installation testing for this important upgrade involved destructively evaluating concrete samples to ensure they met strength specifications. Although the 28 days of cure time required by the code have not yet elapsed, recent tests of the still curing concrete indicate that it already meets the acceptance criteria for compressive strength.

Readiness: This week, LANL provided a set of corrective actions to the site office in response to the recent NNSA annual assessment of the laboratory readiness review program. The assessment was completed in September with a final report issued on October 3rd. Overall, the review concluded that the LANL readiness program met the requirements identified in DOE Order 425.1D. Seven findings and six observations were identified by the review team.

A notable finding identified during the NNSA review was the lack of “consistent performance demonstrating Line Management’s capability to achieve readiness to operate preceding Readiness Reviews.” This issue has been identified as a lesson learned for a number of LANL startup and restart activities. The laboratory corrective action notes that the site has issued procedure P119.0, *Process for Management Self-Assessment (MSA) of Startup and Restart of LANL Nuclear Facilities*. This procedure describes the actions that are required prior to declaring readiness to begin a formal readiness review. This procedure also provides guidance for the execution of systematic self-assessment activities that will assist line management in confirming that nuclear activities are ready to safely begin operations. Poor performance by line management in readiness preparation before commencing the formal readiness review and verification process has been a recurring problem at the laboratory.

Integrated Work Management: In September, the laboratory declared that Integrated Safety Management (ISM) and Integrated Work Management (IWM) are adequately implemented for research and development (R&D) and programmatic work at LANL. This week, the NNSA site office concurred with this declaration based on the results of a recently completed LANL assessment. The laboratory assessment was extensively shadowed by NNSA personnel and the federal shadow team concluded that this review was sufficient to demonstrate that ISM and IWM are adequately implemented for the types of R&D and programmatic activities that have resulted in safety problems in the past. Notwithstanding the overall conclusion, a number of weaknesses were identified during the assessment including the need for better application of conduct of operations principles in some detailed operating procedures, a need for improvement in computerized job hazard analyses and the need to ensure that all relevant hazards and controls are incorporated into technical procedures when these documents are used in lieu of Integrated Work Documents.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 11, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 11, 2011

The Board staff held a conference call with site office and LANL personnel this week to discuss the status and safety strategy for the Transuranic Waste Facility, which will provide an enduring laboratory capability to stage and ship transuranic solid waste after Area G closure.

Federal Oversight: The Performance Evaluation Plan (PEP) is a key tool used by the site office to incentivize contractor performance. The Fiscal Year 2012 PEP includes roughly \$45M in at-risk fee for subjective and objective performance measures with approximately 80%, 10% and 10% identified for essential, stretch and multi-site incentives, respectively.

The award term incentive, which would extend the contract period, includes a mandatory measure for the improvement and integration of formality of operations at the Plutonium Facility (PF-4). Other measures associated with the award term are 1) reduction in the safety basis offsite dose consequence to less than 25 rem for all PF-4 accident scenarios; 2) meeting national security mission requirements; 3) sustaining LANL's science and technology leadership; and 4) meeting goals related to detection and characterization of nuclear and radiological signatures. LANL must achieve success in the mandatory measure and 3 of the 4 other measures in order to meet the criteria for the award term incentive.

The PEP also includes the following performance incentives and measures (this is only a partial list of Fiscal Year 2012 incentives):

- Capability Sustainment and Transition – relocation of sample management from the Chemistry and Metallurgy Research (CMR) building to PF-4; improvements in disposition of newly generated waste
- Capability Risk Reduction – materials disposition and PF-4 vault work-off; Integrated Nuclear Planning for waste operation continuity
- Environmental Management Mission – disposition of newly generated and legacy transuranic waste; environmental planning and execution
- Project Management Performance – CMR Replacement and site-wide project execution performance
- High Hazard Operations – integrate and execute mission and safety commitments (including PF-4 seismic upgrades and criticality safety improvements); formality of operations implementation; nuclear safety improvements (including submittal of safety basis documents); correct fire protection deficiencies; execution of confinement vessel disposition activities at CMR; mature conduct of operations
- Emergency Operations – implement emergency accountability system; improve emergency operations center facility and communication systems
- Excellence in Operations – conduct of operations, safety basis, operational readiness for facility startup and restart, credited safety management programs and vital safety system program improvements

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 18, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director

FROM: B.P. Broderick and R.T. Davis

SUBJECT: Los Alamos Report for Week Ending November 18, 2011

The Board held a public hearing in Santa Fe this week to discuss seismic safety for the Plutonium Facility, emergency preparedness, and the safety of existing facilities and planned replacement facilities. Board members P. Winokur, J. Roberson, J. Bader and J. Mansfield conducted the hearing with testimony from senior NNSA and LANL personnel.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 25, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending November 25, 2011

Federal Oversight: In September, the site office requested LANL to provide a status report on the adequacy and implementation of criticality controls at the Plutonium Facility, safety system operability issues for transuranic waste facilities, and the adequacy of safety management programs for both facilities. LANL provided an initial response in October and was scheduled to provide a comprehensive report on planned actions and performance tracking metrics by the end of November.

In a letter to the laboratory last week, the site office noted significant progress and management focus on criticality safety improvements at the Plutonium Facility but stated that the comprehensive report should fully address issues identified by a recent criticality safety committee review and actions to improve conduct of operations. For the transuranic waste facilities, the site office noted that LANL responses to safety system operability issues appear to justify the status quo and not actions required to “bring about the significant step-improvement in transuranic waste operations that is needed.”

To ensure the LANL response on improving the safety of nuclear operations at these facilities includes the appropriate depth of analysis and adequate corrective actions, the site office letter directed the laboratory to delay their comprehensive report until December 19th.

Plutonium Facility – Safety Basis: Last week, LANL submitted a revised Justification for Continued Operations (JCO) associated with the increased seismic risk identified by the SAFER analysis. The revised JCO takes credit for completion of upgrades to the Plutonium Facility roof such that collapse scenarios during a seismic event are no longer credible. LANL does identify that reevaluation of the facility performance with the roof upgrade in place is ongoing. Any issues that result from this evaluation will be dispositioned using the appropriate site procedure (e.g. unreviewed safety question). Compensatory measures for the previously identified seismic issues remain largely unchanged. The identified expiration date for this JCO is May 11, 2012. LANL continues to pursue facility upgrades to resolve other identified vulnerabilities.

This week, the site office approved a LANL request to close the outstanding Potential Inadequacy of the Safety Analysis (PISA) associated with miscellaneous vault water bath containers. Six “K2” containers remain in the vault water bath that do not meet the safety class performance criteria described in the Documented Safety Analysis (DSA), which caused initial declaration of the PISA in December 2009. However, these containers and safety basis are now appropriately described in the 2011 DSA that was approved in October 2011. Facility implementation of safety controls for the K2 containers is not required. The site office approval letter requests a schedule for disposition of the remaining K2 containers within 90 days.

Radioactive Liquid Waste Treatment Facility: In October, LANL requested site office concurrence with a safety basis strategy for developing a compliant DSA and Technical Safety Requirements for this facility in 18 months. Last week, the site office disagreed with the 18 month schedule and directed the laboratory to submit compliant documents by September 2012.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 2, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 2, 2011

Transuranic Waste Operations: The Area G safety basis includes TSR-level inventory limits on the curie content of both transuranic waste and tritium. The TSRs require a quarterly surveillance to confirm that the Area G tritium inventory remains below the approved limit. The quarterly surveillance is performed by querying a computer database that tracks the quantity of tritium at Area G and comparing the current inventory value to the TSR limit. During a recent surveillance, an Area G operator recognized that the tritium inventory value reported by the tracking software had not changed from the previous surveillance even though tritium material moves had been made. Subsequent evaluation revealed that there was an error in the tritium inventory tracking software.

Per the LANL institutional software quality assurance program, requirements for software change control and verification and validation are graded based on the importance of the software. Area G inventory tracking software is rated at the highest level of safety-related software subjecting it to the most stringent change control requirements. In 2010, a change was made to the inventory software that caused it to report incorrect tritium inventory values. This error was not identified during required software change verification and validation activities. As a result, TSR-level surveillances were performed for roughly two years using invalid tritium inventory values. This week, Area G management declared a TSR violation based on this discovery.

Also this week, operators at the WCRR repackaging facility cracked a glovebox window when a tool they were using to remediate the contents of a drum slipped and the tool handle impacted the glovebox glass. No contamination was released in this event, but cracking glovebox windows with tools has been a recurring problem at WCRR. In response, facility management is emphasizing the need to use the right tool for job when removing the contents of transuranic waste drums inside the WCRR glovebox.

Radioactive Liquid Waste Treatment Facility (RLWTF): This week during low level waste processing operations, an equipment failure caused an RLWTF operator to be sprayed in the face with 25% sodium hydroxide solution resulting in localized second degree burns to his lips. The operator was adjusting the setting of a caustic solution addition pump when the failure occurred.

Maintenance of the caustic addition system had been performed the day before the event. The maintenance activity required the normal valve line-up for the caustic addition system to be changed. The maintenance work package called for the valves to be repositioned according to operations personnel instructions upon completion of the evolution, but the work was completed after hours when no operations personnel were present. The valves were left in an abnormal line-up and valve position status was not effectively communicated to operations personnel. The next day facility personnel did not perform a procedurally required pre-operational valve alignment check prior to beginning low level waste processing activities. As a result, the caustic addition system was not in the expected configuration when it failed and sprayed the operator. The exact cause of the equipment failure is being investigated by facility personnel.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 9, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 9, 2011

Weapons Engineering Tritium Facility (WETF): The WETF safety basis credits combustible loading limits as a TSR-level control and requires monthly and annual surveillances for transient and permanent combustibles, respectively. WETF uses a detailed software spreadsheet to track the quantities of combustibles present in the facility and to compute the combustible loading (in units of lbs/ft²) for WETF rooms that have defined limits. A summary spreadsheet then imports the computed combustible loading values from the detailed spreadsheet and operators use the data from the summary spreadsheet to perform the monthly TSR surveillance.

On Thursday, a WETF operator performed the monthly combustible loading surveillance, documented that the combustible loading for all rooms complied with TSR limits, and turned in completed surveillance paperwork to the Operations Center. A post-surveillance review by Operations Center personnel discovered that for one WETF room, the documented combustible loading value from the summary spreadsheet exceeded the TSR limit by roughly a factor of four, but had been recorded as satisfactory during the surveillance.

Follow-up investigation showed that the combustible loading in the affected WETF room actually complied with TSR limits. However, a recent change to the summary combustible loading spreadsheet had introduced an error that caused it to import data from the wrong fields in the detailed spreadsheet. WETF combustible loading spreadsheets are graded as the second highest level of safety-related software, but required change control and verification and validation (V&V) protocols failed to identify this error. Several recent events have highlighted failures of existing change control and V&V protocols to identify errors introduced to safety-related software spreadsheets by changes. WETF declared a TSR violation in August based on a container pressurization spreadsheet error and last week Area G declared a TSR violation based on a tritium inventory tracking spreadsheet error.

Plutonium Facility: On Thursday, the site office issued the Safety Evaluation Report (SER) that approves revision 2 of the Justification for Continued Operation (JCO) for seismic issues associated with the Plutonium Facility. This JCO reflects completion of facility upgrades and implementation of compensatory controls. The Kardex unit has also been added as a component that will be upgraded. The site office SER directs implementation of additional controls for mezzanine loading within 30 days. The JCO expires on May 11, 2012. LANL continues to work on additional analyses of building seismic performance to address concerns identified by the Board's staff and independent peer reviews.

Transuranic Waste Operations: This week, the federal readiness assessment team completed their review of the box repackaging line in Area G's Building 412 and briefed their results to site office and LANL management. The team recommended that LASO authorize startup following resolution of the one pre-start finding (a carryover finding from the contractor readiness assessment) and approval of corrective actions for the two post-start findings identified by the federal review team. As a noteworthy practice, the team noted that the project team and personnel demonstrated a visible nuclear safety awareness and focus on eliminating or mitigating challenges to safe and reliable operations. Results from recent laboratory readiness reviews and this review indicate significant improvements in line management readiness and startup performance for waste disposition programmatic activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 16, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 16, 2011

Staff members J. Pasko and C. Shuffler were onsite this week to review the design and safety basis for the Transuranic Waste Facility Project. In addition, staff members A. Hadjian, J. Kimball and Z. McCabe were onsite Thursday to discuss the status and results of ongoing seismic-structural analyses of the Plutonium Facility. LANL presented the results from a sensitivity analysis that re-evaluated the performance of key facility roof features and discussed the path forward for performing an important static non-linear analysis of the Plutonium Facility.

Plutonium Facility: The NNSA site office has approved an implementation plan for the 2011 Plutonium Facility Documented Safety Analysis (DSA) and associated Technical Safety Requirements (TSR). The approved plan calls for an Independent Verification Review to confirm implementation of the 2011 DSA and TSRs by May 25, 2012. Notably, the 2011 DSA and TSRs cannot take effect as a stand-alone safety basis (i.e. they must be accompanied by a Justification for Continued Operation that covers seismic issues) until Plutonium Facility structural upgrades have been completed to prevent seismically-induced collapse or loss of confinement integrity.

Transuranic Waste Operations: Area G currently stores about 300 Fiberglass Reinforced Plywood (FRP) boxes that contain transuranic waste. These FRP boxes house contaminated gloveboxes, equipment, and debris removed from the TA-21 Plutonium Facility (predecessor to the current TA-55 Plutonium Facility) when it was decommissioned in the mid-1970's. Area G FRP boxes vary widely in both size and material-at-risk content. LANL personnel are establishing multiple processing lines to open FRP boxes, remove their contents, size reduce large items, and repackage the resulting waste in Standard Waste Boxes for shipment to WIPP.

In July, LANL personnel began processing FRP boxes that contained less than 0.52 ²³⁹Pu-equivalent Ci (i.e. less than the Hazard Category 3 threshold) inside a confinement tent in Area G's Building 412. After a campaign to process low activity FRP boxes in Building 412, LANL personnel successfully completed a recent NNSA readiness assessment to begin remediating FRP boxes that contain Hazard Category 3 quantities of transuranic waste. This week, the NNSA site office formally authorized Hazard Category 3 FRP box processing in the Building 412 confinement tent.

LANL transuranic waste personnel also intend to establish FRP box processing lines in Area G's Dome 231 and Dome 375. The existing Dome 231 Permacon will be reconfigured with upgraded fire suppression, ventilation, and electrical systems to support Hazard Category 3 FRP box processing. Dome 375 will be outfitted with a new Permacon structure to process large FRP boxes and boxes that contain a larger quantity of material-at-risk, including the roughly 10 boxes containing inventory that exceeds the Hazard Category 2 threshold of 56 ²³⁹Pu-equivalent Ci.

Federal Oversight: This year, NNSA established a Performance Based Incentive (PBI) for LANL to develop and use a set of metrics to demonstrate the continuous improvement and maturity of Formality of Operations. Yesterday, the site office rejected the initial LANL deliverable in part because the proposed metrics did not represent leading indicators as required by the NNSA PBI.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 23, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending December 23, 2011

Plutonium Facility: Laboratory and NNSA management are focusing sustained attention on improving criticality safety and conduct of operations practices at the Plutonium Facility. The site office has heavily emphasized these improvements in FY12 contractual Performance Based Incentives (PBI) and LANL management is making meaningful progress in implementing changes to processes and training designed to improve criticality safety and conduct of operations performance.

In August, a troubling criticality safety infraction occurred at the Plutonium Facility that increased management concern over criticality safety and conduct of operations and highlighted the pressing need to address shortcomings and improve performance in these areas. In the August event, a researcher, who was a certified fissionable material handler (FMH), wanted a photograph of the results of a recent plutonium casting operation. The FMH accessed material in a glovebox that he was not authorized or released to work in and violated posted criticality safety limits by taking plutonium metal rods from two separate material locations and bringing them together in a single location. During this evolution, a second certified FMH entered the area and recognized the plutonium mass in the glovebox location significantly exceeded posted limits. The two certified FMHs then violated requirements for dealing with criticality safety infractions by re-accessing the affected glovebox and moving the rods back to their original locations.

In response to the significance of the August event and in reaction to prompting from the NNSA site office, LANL management is taking serious action to improve criticality safety and conduct of operations compliance. At the outset, LANL senior management re-assigned a highly experienced Plutonium Facility manager to work full-time on developing, coordinating, and executing improvement efforts. This dedicated manager and his working group began by drafting major revisions to the procedures that govern criticality safety program implementation and fissionable material transfers at the Plutonium Facility. The revised procedures provide much greater clarity in the roles, responsibilities, and requirements that apply to operators and supervisors during glovebox work and fissionable material transfers.

More recently, the dedicated improvement manager led an effort to completely overhaul the Plutonium Facility's FMH certification process. The new process involves classroom training with an exam, a performance demonstration, and an oral board. The new classroom training is well structured and well taught using many practical examples from Plutonium Facility operations and experiences to illustrate relevant criticality safety and conduct of operations concepts. The new performance demonstrations and oral boards are significantly more rigorous than anything required by the old certification process.

Taken together, it appears that the new FMH certification process is a more credible approach to instilling and then testing required knowledge and understanding than has been used in the past at the Plutonium Facility or is typically used elsewhere at the laboratory. All Plutonium Facility FMHs and their supervisors are currently undergoing recertification using the new process.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 30, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director

FROM: B.P. Broderick and R.T. Davis

SUBJECT: Los Alamos Report for Week Ending December 30, 2011

This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 6, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 6, 2012

Transuranic Waste Operations: In 2005, the Department of Energy/National Nuclear Security Administration (DOE/NNSA) and the New Mexico Environment Department (NMED) entered into a formal Compliance Order on Consent (Consent Order) that set legally-binding schedule milestones for environmental remediation and restoration activities at LANL. A key Consent Order milestone results in the termination of activities and closure of Area G, which drives a need to remove all above-ground and retrievable below-ground transuranic waste from Area G and complete all necessary environmental corrective measures by the end of 2015.

This week, DOE/NNSA and NMED jointly issued a new Framework Agreement that describes a realignment of environmental priorities at LANL. The Framework Agreement differentiates between different types of Area G transuranic waste based on the relative risk of the material being released or dispersed in accidents, including wildland fires. On this basis, above-ground non-cemented transuranic waste receives a higher priority for disposition than cemented or below-ground transuranic waste. The Framework Agreement includes the following DOE/NNSA commitments:

- Complete removal of all non-cemented above-ground legacy transuranic waste at Area G by June 30, 2014;
- Complete removal of all newly generated transuranic waste that is received at Area G in FY12 and FY13 by December 31, 2014; and
- Develop, by December 31, 2012, a plan and schedule for the removal of retrievable below-ground transuranic waste at Area G.

Although all parties to the Consent Order endorse the Framework Agreement, it is not legally-binding and the existing Consent Order remains in force. In conjunction with this week's joint issuance of the Framework Agreement, DOE/NNSA publically acknowledged that it is not possible to meet the current Consent Order milestone to complete Area G clean-up activities by the end of 2015. The Framework Agreement notes that DOE/NNSA and NMED will meet at an appropriate time to consider Consent Order changes.

Federal Oversight: In September, the site office requested LANL to evaluate Plutonium Facility and Waste Disposition Project nuclear safety issues; determine deficiencies, causal factors and the extent of problematic conditions across the site; and provide a comprehensive report on planned actions and a suite of performance metrics to monitor conditions and progress. In December, LANL responded to this request and submitted the LANS Nuclear Safety Culture Analysis and Improvement Plan, which details the site's plans for review and causal analysis of nuclear safety issues. A project team has been assigned to execute this plan and LANL intends to implement corrective actions as they are identified by the team. In addition, an initial set of performance metrics, which will be refined as the project progresses, have been identified to track improvements in nuclear safety. At this point, the LANL submittal only provides an initial plan for identification of nuclear safety improvements in Fiscal Year 2012.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 20, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 20, 2012

Transuranic Waste Operations: The site office recently provided comments to LANL on Area G Documented Safety Analysis and Technical Safety Requirements (TSRs) changes associated with minimum shift staffing requirements and drum venting operations. LANL plans to resubmit these changes later this month to resolve site office comments.

In October, LANL requested site office approval to revise the safety basis minimum shift staffing requirements that preclude working alone for certain activities not involving transuranic waste operations at Area G. The revised TSRs require a Shift Operations Supervisor, an Operations Center operator, and a nuclear operator with a fire watch operator on call (i.e. able to respond within 2 hours) for operations when material-at-risk is present and transuranic waste operational activities are being performed. The safety basis also requires all of these personnel to be on call when material-at-risk is present but transuranic waste operational activities are not being performed. Transuranic waste operational activities are defined as active waste handling (e.g. waste container movement, characterization and processing). The LANL request noted that the changes will ensure that minimum staff are available to perform TSR actions when required and are consistent with the NNSA Technical Bulletin on minimum staffing.

In November, LANL also requested changes to the Area G safety basis to support drum venting using the Area G Drum Venting System (DVS) in a remote configuration (i.e. with operator standoff requirements during key venting operations). Startup of this operation without the remote configuration failed in 2011 when questions arose during the contractor readiness assessment about non-conservative hydrogen deflagration assumptions in the safety basis (see 4/22/11 site rep report). The safety basis changes are based on controls required for previous remote venting operations, the planned DVS operations and the updated analysis to support the Area G Basis for Interim Operation. LANL has not performed drum venting operations since the deflagration event that occurred in November 2008 during previous remote venting operations.

Federal Oversight: As a part of the fiscal year 2012 performance based incentives, the site office included a measure for the contractor's ability to integrate and execute mission and safety commitments. Based on feedback from NNSA on a previous submittal, LANL recently provided a proposed list of milestones to measure success in this area that included the following:

- Plutonium Facility – Conduct of Operations improvements, criticality safety improvements, seismic safety improvements and material stabilization progress
- Safety Basis – High quality, on schedule safety basis submittals, and a schedule for safety basis annual updates
- Transuranic Waste Operations – RANT shipping facility safety basis submittal, readiness for 231 Permacon box line and drum venting operations, de-inventory MDA-B, ship 22,500 PE-Ci offsite from Area G, implement DOE Order 426.2, reduce NCR closure times and submit corrective action plan for initial nuclear safety culture causal analysis (last item due 3/12/12)
- Chemistry and Metallurgy Building – Improve Fissile Material Handler training and certification, and complete scheduled vital safety system assessments
- Weapons Engineering Tritium Facility – Startup gas transfer operations from the function tester through the load out and high pressure gloveboxes

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 27, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending January 27, 2012

Plutonium Facility: This week, Plutonium Facility management declared a TSR violation based on the failure to perform a required In-Service Inspection (ISI) on a safety significant design feature. The Plutonium Facility safety basis requires the use of credited containers for all operations that could produce molten plutonium metal. These containers provide a confinement barrier for molten plutonium in the event of a process or furnace upset. Recently, Plutonium Facility personnel discovered an infrequently used process that creates molten plutonium metal. The containers used in this process are made of the correct material for molten plutonium processing, but the containers had not been subjected to the applicable ISI as required by the TSR.

Chemistry and Metallurgy Research (CMR) Building: The CMR safety basis credits shielding associated with CMR's Waste Assay Facility (WAF) as a safety significant design feature to protect workers from radiation produced by radiation generating devices inside the WAF. The CMR TSRs require an ISI to be performed on the WAF shielding every two years. Personnel must be qualified to perform this inspection by completing a computer based self-assessment and a performance demonstration of the ISI procedure. During a Vital Safety System Assessment, CMR personnel recognized that the most recent WAF shielding ISI was performed by an individual who had completed the self-assessment, but not the required performance demonstration and was therefore not qualified to perform the inspection. This discovery prompted facility management to declare a TSR violation based on the failure to satisfactorily perform an ISI within the required frequency. In response to this violation, facility personnel are performing an extent of condition review to identify any other TSR-level inspections or Surveillance Requirements that may have been performed by unqualified personnel.

Transuranic Waste Operations: Recently, LANL consolidated all Fiberglass Reinforced Plywood (FRP) boxes into a single dome in Area G that has an operable fire suppression system. This action improves the safety posture for these transuranic waste forms in the interim as Area G personnel continue to disposition these items. The FRP boxes contain legacy contaminated equipment and debris from decommissioning the TA-21 Plutonium Facility in the 1970s. LANL is currently processing FRP boxes in Building 412. This year, LANL plans to startup FRP processing lines in the Dome 231 Permacon and in Dome 375. FRP processing activities at less than 2.5 PE-Ci are covered under the Area G safety basis for sort, segregate and size reduction activities. For a small number of large FRP boxes, LANL plans to perform processing activities (i.e., waste removal, size reduction and repackaging) in-place, using confinement tents erected around the large boxes; however, this activity is not scheduled for 2012.

Safety Basis: This week, the site office approved a proposed revision to the LANL Unreviewed Safety Question (USQ) Procedure to incorporate changes to DOE Guide 424.1-1B, *Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements*. The revision also provides improved linkage between the USQ and new information processes, includes required actions times in response to a potential inadequacy in the safety analysis, and adds an expert-based USQ screening process (the last will be piloted and reviewed during the next year). The site office approval notes that the LANL new information process needs to be substantially improved or discontinued and requests detailed contractor review of the process. A report on lessons learned and the advantages/disadvantages of continuing this process is requested by May 1, 2012.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 3, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 3, 2012

Plutonium Facility: The Plutonium Facility safety basis credits the criticality alarm system as a safety significant control for worker protection. Plutonium Facility TSRs require a quarterly channel function test to ensure the system will produce an alarm when detector heads in the vault indicate radiation levels at or below 75 mR/hr. A quarterly channel function test of the criticality alarm system was performed in December. During this test all four detector channels in the vault were recorded as producing alarms at 80 mR/hr. Personnel performing the test and subsequent reviewers did not recognize that these results failed to meet the acceptance criteria and documented the surveillance as being completed satisfactorily. This week, the cognizant system engineer for the criticality alarm system was reviewing completed surveillance documentation and recognized the error. Plutonium Facility management declared a TSR violation based on this discovery. Facility personnel have reperformed the channel function test and all four vault detector heads were found to produce alarms at or below 75 mR/hr, as required.

Weapons Engineering Tritium Facility (WETF): Personnel at WETF measure the composition of gas mixtures using a Hot Inlet System that contains piping to route gas samples through various diagnostic instruments. In October 2010, facility operators discovered that small amounts of oxygen were leaking into the Hot Inlet System where under uncontrolled conditions it could potentially mix with hydrogen isotopes to form a combustible atmosphere. Since this situation presented a deflagration hazard that had not been analyzed in the WETF safety basis, facility management declared a Potential Inadequacy of the Safety Analysis (PISA) and in July 2011 implemented a Justification for Continued Operations that contained controls to prevent a deflagration from Hot Inlet System oxygen in-leakage.

After successfully operating under this JCO for approximately one month, facility personnel discovered another oxygen in-leakage pathway that affected the safety-significant Tritium Waste Treatment System (TWTS). This discovery prompted another PISA and the JCO was revised to include new controls to address the TWTS in-leakage. Before the revised JCO was implemented, facility management submitted a safety basis page change package that updated the WETF Final Safety Analysis Report and TSRs to include oxygen in-leakage hazards and controls. In the Safety Evaluation Report approving this package, the NNSA site office explicitly identified the Hot Inlet System as a safety significant control. In response, LANL management submitted another safety basis page change that was intended to present a technical justification to remove the Hot Inlet System as a safety significant control.

This week, the NNSA site office disapproved the proposed safety basis change concluding that the entire Hot Inlet System serves a safety significant function by protecting workers from tritium releases and deflagrations. In response, WETF personnel are preparing a revision to the oxygen in-leakage JCO for NNSA review and approval that will address the Hot Inlet System until the functional classification issues are resolved. The facility remains in warm standby mode with programmatic tritium gas handling operations suspended pending approval and implementation of the revised JCO.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 10, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 10, 2012

This week, staff members Hadjian, Kimball, McCabe, and Pasko met with NNSA-Headquarters, site office, and contractor personnel to discuss completed and ongoing analyses of the Plutonium Facility seismic response including plans to perform a static non-linear analysis, which is scheduled to be complete in June and may identify the need for additional structural upgrades.

Plutonium Facility: On Tuesday, Plutonium Facility personnel discovered a leak in the safety class fire suppression system when operators observed water on the floor of a laboratory room used for pit manufacturing. Upon discovery, personnel isolated the affected portion of system piping, entered the applicable TSR Limiting Condition for Operation and instituted a fire watch. The system was repaired, confirmed to be operable and returned to service by the end of Tuesday.

The leak developed at an elbow joint in the fire suppression system piping. The failed joint fitting was installed during system modifications performed in 2005. Preliminary evaluation of the failed fitting suggested a hairline crack may have developed due to over-tightening of the tapered threaded connection during installation. Results of more detailed metallurgical evaluation are pending. In response to this event, facility management has directed engineering personnel to develop a plan to inspect system piping and components as part of an extent of condition review. The extent of condition inspections will focus on other components that were installed during the 2005 system modification, but will also involve a sampling of older components.

Weapons Engineering Tritium Facility (WETF): LANL recently submitted a revised Justification for Continued Operations (JCO) that includes compensatory measures for the Hot Inlet System. As discussed last week, the site office disapproved a proposed WETF safety basis change to downgrade the Hot Inlet System from safety significant noting that the system protects workers from tritium releases and deflagration accidents. The revised JCO includes compensatory measures that establish an engineering and maintenance work package to identify and repair Hot Inlet System leaks. In addition, maintenance and modifications to this system will be performed in accordance with Management Level 2 requirements, which is consistent with expectations for a safety significant system. Programmatic tritium gas handling operations remain suspended pending site office approval and implementation of the revised JCO.

Radioactive Liquid Waste Treatment Facility (RLWTF): In November 2011, the site office disapproved a LANL safety basis strategy for developing a 10 CFR 830 rule compliant Documented Safety Analysis (DSA) over 18 months and requested the safety basis be submitted by September 2012. The disapproval noted that the facility is not complex, hazards are well understood, basic controls to ensure safe operations are established, and much of the required DSA information is contained in the existing Final Safety Analysis Report (FSAR). This week, LANL submitted a plan for upgrading the safety basis consistent with DOE Standard 3009 and for addressing outstanding site office comments. RLWTF is currently operating under a FSAR that was approved in 1995.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 17, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 17, 2012

Chemistry and Metallurgy Research Replacement (CMRR): This week, NNSA-Headquarters provided direction to LANL on the CMRR-Nuclear Facility (CMRR-NF) noting that, consistent with the President's budget, no funding is requested for the facility and construction of the CMRR-NF is deferred for at least five years. The budget request includes \$35M to accelerate actions to optimize storage capacity in the existing Plutonium Facility vault. The NNSA-Headquarters direction notes that the budget request will require optimized use of existing infrastructure to maintain continuity of programmatic activities. LANL is requested to provide an interim briefing in 30 days and a final plan in 60 days that include the following elements:

- A plan to substantially complete CMRR-NF design by the end of FY 2012 including design close-out activities to ensure project documentation is available for potential future use.
- An orderly phase out of NNSA program activities at the existing Chemistry and Metallurgy Research Building concluding in approximately 2019 (following completion of the Confinement Vessel Disposition project in Wing 9).
- Plans for continued analytical chemistry capabilities to support mission needs that include maximum use of the Radiological Laboratory, Utility and Office Building (RLUOB).
- Capability to safely and securely move material between RLUOB and the Plutonium Facility and address sample preparation at the Plutonium Facility.
- Consider options at other NNSA sites to address residual analytical chemistry needs.
- Maintain required material characterization capabilities using the Plutonium Facility and Building 332 at Livermore as a Hazard Category 2, Security Category 3 nuclear facility.
- Minimize nuclear material at the Plutonium Facility by processing, packaging, and shipping excess materials including a plan and estimated timeline to stage bulk quantities at the Device Assembly Facility.

Plutonium Facility: This week, LANL requested site office review and approval of an Evaluation of the Safety of the Situation (ESS) for a potential criticality safety issue for the Confinement Pressure Vessels (CPVs) stored at TA-55. In January, LANL identified that no existing criticality safety evaluation (CSE) exists to support storage and movement of these vessels contrary to statements in the TA-55 Hazard Analysis. Immediate actions were taken to ensure the CPVs were not moved and this issue was evaluated and determined to be an Unreviewed Safety Question. The ESS concludes that there is essentially no potential for an inadvertent criticality as long as the CPVs are not moved. The ESS states that the compensatory measure on movement will remain in place until LANL develops CSEs that support storage and movement at TA-55. LANL plans to transfer and disposition these vessels during the Confinement Vessel Disposition Project at CMR.

Federal Oversight: The NNSA office issued a letter to LANL this week noting ten operational events in the last month that indicate potential issues with control and integration of work activities. The letter requests LANL evaluate the events and identify common cause and systemic issues. The laboratory also continues actions associated with the LANS Nuclear Safety Culture Analysis and Improvement Plan that responds to a September 2011 site office request on improving nuclear safety.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 24, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending February 24, 2012

Plutonium Facility: The approved, but not yet implemented, 2011 annual update to the Plutonium Facility DSA asserts the mitigated offsite dose for the bounding postulated facility accident involving a seismically-induced fire is 23 rem, a value just below the DOE Evaluation Guideline. The 2011 DSA relies on two key elements to support this significant reduction of consequences compared to previous safety analyses: (1) an assumption that all structural features of the safety class building that could fail in an evaluation-basis earthquake and cause facility collapse or loss of confinement will be identified and fixed prior to implementation of the 2011 DSA, and (2) refined assumptions and analysis associated with the seismically-induced fire scenario that reduce the material at risk (factor of ~2), the airborne release fractions and respirable fractions of materials (factor of ~30), and the leak path factor (factor of ~2).

Laboratory personnel are in the process of performing an important static non-linear analysis scheduled to complete in June that will determine whether additional structural vulnerabilities exist that could lead to facility collapse or loss of radiological confinement. In parallel, LANL and NNSA have aggressively pursued and completed upgrades to repair known structural vulnerabilities. These upgrades include plenum room beam-to-column connections (complete July 2011), glovebox exhaust fan pads (complete October 2011), plenum room captured columns (complete August 2011), concrete shield wall connections (complete November 2011), roof drag strut (complete November 2011), laboratory ceiling beams (complete December 2011), and mezzanine upgrades. Last week, Plutonium Facility personnel finished field work on the last of five mezzanines that required modifications. This marked physical completion of all currently planned facility upgrades pending results of the static non-linear analysis.

Analytically, the 2011 DSA reduced the material at risk by imposing more stringent limits on the amount of inventory allowed on the facility's laboratory floor. Dispersibility parameters were reduced by disaggregating the material at risk and analyzing the dispersibility characteristics of each specific form of material (e.g. metals, oxides, and solutions). The leak path factor was reduced based on revised fire analysis that concludes a seismic event will cause a number of individual lab room fires rather than a large floor-wide fire, as previously assumed. Smaller fires with lower overall thermal output contribute less motive force to drive aerosolized material out of the building and result in a reduced leak path factor.

The revised fire analysis concludes that the new seismically-induced fire scenario should assume one "probabilistic fire" and three "deterministic fires." The probabilistic fire is based on statistical analysis of 80 years of seismically-induced fire ignition data from Alaska and California for all structures in the "generally built environment," that is, all residential, commercial, and industrial structures. The deterministic fires are postulated to occur in lab rooms that operate high temperature furnaces that intentionally take plutonium metal to a molten state. Last week, LANL management submitted a DSA revision for NNSA review and approval that includes additional technical discussion of the revised fire analysis and how it was used in developing the new seismically-induced fire scenario in the DSA. The DSA revision provides new justification to support the assumption that only furnaces that produce molten plutonium metal, rather than all high temperature furnaces, present an increased probability of seismically-induced fire ignition in relation to the generally-built environment. The DSA revision also provides a technical argument that the new leak path factor analysis is conservative because its final calculated value assumes four lab room fires in each half of the building for a total of eight room fires.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 2, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 2, 2012

Staff members T. Cutler, E. Elliott and J. Pasko were onsite this week to observe an NNSA-Headquarters review of the LANL criticality safety program.

Transuranic Waste Operations: This week, RANT shipping facility management declared a Technical Safety Requirement (TSR) violation based on a failure to comply with the Vehicle Access Control specific administrative control (SAC). This SAC credits the control of vehicle access features, such as gates and bollards to reduce the probability of vehicle impacts and subsequent fuel pool fires that could impinge on transuranic waste.

Last Friday, a LASO Facility Representative arrived at the RANT shipping facility and discovered a vehicle access gate open and unmanned. The Facility Representative alerted facility management and the gate was closed, the RANT facility yard was inspected for unauthorized vehicles (none were present), and the RANT operations crew was briefed on the need to maintain control of vehicle access features. RANT shipping facility procedures address gate control when transuranic waste is being moved into or out of the facility or yard, but not all vehicle access gate openings are procedurally controlled. In this case, a vehicle access gate was opened to allow the passage of a forklift and operators forgot to restore the gate to a closed position.

Material Disposal Area-B (MDA-B): Early this week, LANL completed removal of all material at risk that was excavated from MDA-B in Technical Area-21. MDA-B is a six-acre legacy waste disposal area that was used to bury radiological and chemical waste in the late-1940s and is close to public areas. Removal of this legacy waste represents a significant achievement in reducing the hazards at Technical Area-21.

Transuranic Waste Operations – Safety Basis: On Thursday, the site office approved the Area-G Basis for Interim Operations (BIO) and TSRs that were submitted in January 2012. This safety basis was developed and approved in accordance with 10 CFR 830 and represents the first major revision to the Area-G safety basis since 2003. The site office identified the following three conditions of approval: 1) elevate the current requirement for overburden (currently an element of a safety management program) to a specific administrative control or design feature; 2) elevate the requirement to use non-sparking tools as a control for certain deflagration accident scenarios and; 3) analyze hazards associated with acetylene, derive appropriate controls, and incorporate these controls into the BIO and TSRs. All of the conditions of approval are due in 90 days.

As part of the next annual update for Area-G, the site office requested that LANL re-evaluate hazard and accident analyses without taking specific risk reduction credit for safety management programs (with the exception of the criticality safety program). In addition, the site office directed that the accident analysis dose consequences be re-calculated using atmospheric modeling that does not use plume meander. The site office approval letter directs the laboratory to submit an implementation plan for the new safety basis within 30 days that reflects full TSR implementation at Area-G within 6 months.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 9, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 9, 2012

Management: This week, LANL senior management announced the selection of two key contractor positions. First, Jeff Yarbrough was selected as the Associate Director for Plutonium Science and Manufacturing replacing Carl Beard, who is now the Principal Associate Director for Business and Operations. Second, Charles Anderson was identified as the Associate Director for Nuclear and High Hazard Operations. Mr. Anderson has been acting in this position for approximately 8 months.

Chemistry and Metallurgy Research Building (CMR): The CMR TSRs credit a flammable gas control to limit the quantity of flammable gases such that the lower flammability limit (LFL) cannot be exceeded in a storage volume if the entire contents of a gas source are released. On February 15th, CMR personnel discovered a small propane bottle in an unmarked and nondescript plumber's kit stored in a cabinet. This source and storage configuration did not comply with the requirements of the flammable gas control in the CMR TSR document. In response, facility management entered the applicable TSR action statements, relocated the propane bottle to a compliant storage location, and initiated an extent of condition review to identify any similar problems elsewhere in CMR.

This week, as part of the extent of condition review, CMR personnel discovered another propane bottle in an identical plumber's kit that was stored in a location where the LFL could be exceeded if the bottle released its entire contents. In response, facility management again took appropriate response actions and declared a TSR violation. The extent of condition review will continue until all required areas of the facility have been searched for inappropriately stored flammable gases.

Weapons Engineering Tritium Facility (WETF): Facility procedures require WETF gloveboxes to be leak tested by drawing a vacuum on the affected glovebox and measuring the pressure rate-of-rise and then pressurizing the affected glovebox and measuring pressure rate-of-fall. This week, WETF personnel were performing the vacuum portion of the leak testing procedure when oxygen alarms annunciated inside affected glovebox sections. Operators immediately terminated the test and purged the glovebox sections with nitrogen, forcing the oxygen into the Low Pressure Receiver (LPR) intake section of the Tritium Waste Treatment System. Oxygen readings inside the glovebox sections reached a maximum of about 5.5%, but oxygen readings inside the LPR remained well below 1%.

The WETF safety basis includes a Specific Administrative Control (SAC) that is designed to reduce the probability of forming a deflagrable mixture of gases inside the LPR. This SAC is applicable to open glovebox maintenance (e.g. maintenance that requires a glovebox window to be removed) and other operations that could intentionally introduce enough oxygen into the LPR to challenge the limiting oxygen concentration (LOC) for combustion. When applicable, this SAC requires material at risk to be "segmented" within affected glovebox sections by closing and tagging valves. During a critique for the oxygen alarm event, facility management recognized that the LPR oxygen concentration never approached the LOC of 5% in this instance; however, upset conditions during glovebox leak testing could credibly challenge the LOC in the LPR. The ability to challenge the LOC in the LPR would invoke SAC requirements, including segmentation. Since MAR was not formally segmented during the glovebox leak testing evolution, facility management declared a TSR violation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 16, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 16, 2012

Emergency Preparedness: This week, laboratory, NNSA and Los Alamos County personnel participated in an emergency exercise that simulated an earthquake followed by a wildland fire. The exercise scenario involved a magnitude 5.6 earthquake that initiated a small wildland fire in Technical Area 52. Transportation routes and communications were assumed to be impacted, but no catastrophic structural failures or material releases were postulated for nuclear or high hazard facilities. This is first time in recent years that the laboratory has performed an exercise involving a sitewide rather than facility-specific event. Exercise evaluators are compiling information about performance during the exercise and will issue a report that includes lessons learned and opportunities for improvement. Lab management intends to continue improving emergency response planning and execution for sitewide events by exercising increasingly challenging scenarios over time.

Plutonium Facility: Radiological material is authorized to be staged in several locations within the protected area outside of the Plutonium Facility. Containerized transuranic waste can be staged on an outdoor asphalt pad and material associated with the Offsite Source Recovery Project (OSRP) can be staged in an outdoor transportainer. The Plutonium Facility safety basis credits a specific administrative control (SAC) that prohibits vehicle refueling activities from being conducted within 100 feet of the transuranic waste pad or OSRP transportainer. The intent of this control is to prevent liquid fuel fires from directly impacting the transuranic waste containers or OSRP material.

Recently, an NNSA Facility Representative questioned whether other refueling operations that did not involve vehicles were being conducted near the waste pad or OSRP transportainer that could create the opportunity for liquid fuel fires and violate the intent of the SAC. In evaluating this concern, facility personnel recognized that an underground diesel fuel tank that supplies a pump house for the safety class Plutonium Facility fire suppression system is located approximately 40 feet away from the transuranic waste pad. This roughly 580 gallon tank is refueled about every six months and these operations create the possibility of initiating a liquid fuel fire that could directly impact the containerized transuranic waste staged on the pad. This week, Plutonium Facility management declared a Potential Inadequacy of the Safety Analysis in response to this issue.

Transuranic Waste Operations: The NNSA site office recently approved a revision to the RANT shipping facility Basis for Interim Operation (BIO) and Technical Safety Requirements (TSRs) to incorporate updated details and hydraulic calculations for the fire suppression system (FSS). An assessment of the FSS concluded that the field conditions did not align with system drawings that were used for the hydraulic calculations. The site office approval letter directs LANL to submit an equivalency to National Fire Protection Association (NFPA) Standard 13 within 90 days to resolve a non-compliance with requirements for minimum sprinkler spacing. The BIO notes that the FSS meets NFPA 13 minimum flow density requirements (0.2 gpm/ft^2) despite the non-compliance.

In February, an NNSA Facility Representative identified conflicting requirements in the RANT TSRs for critical lift plans for transuranic waste container handling. The NNSA approval letter also directs a change to the SAC for hoisting and rigging to clarify when critical lift plans are required.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 23, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 23, 2012

Staff members F. Bamdad, T. Chapman, C. March, J. Pasko and R. Verhaagen were onsite this week to review the 2011 update of the Plutonium Facility Documented Safety Analysis (DSA) and Technical Safety Requirements (TSRs).

Federal Management: Recently, NNSA announced the selection of Juan Griego as the LASO Deputy Site Office Manager. Mr. Griego has been acting in this role since August 2011 and was previously the Assistant Manager for National Security Missions.

Plutonium Facility – Safety Basis: LANL continues activities to implement the 2011 DSA and TSRs, which are currently scheduled to be complete by May 25, 2012. The laboratory has also submitted two minor revisions (revision 1.1 and 1.1a) to this safety basis to clarify and correct the DSA and TSRs and to resolve site office comments. In addition, the facility is operating under the Justification for Continued Operations (JCO) for seismic-structural vulnerabilities that will expire on May 11th. LANL has requested site office approval to extend the JCO expiration date to align with the DSA and TSR implementation schedule. All physical upgrades identified in the JCO have been completed and controls on Mezzanine loading and cement silo level are included in the new safety basis. The site office is reviewing the minor safety basis changes and JCO extension request. LANL and subcontractor personnel are also completing a static non-linear analysis of the facility to determine if additional facility upgrades are required.

Weapons Engineering Tritium Facility (WETF): In November 2008, LANL identified a Potential Inadequacy of the Safety Analysis (PISA) because certain tritium containment vessels may exceed their maximum allowable working pressure (MAWP) under accident conditions (i.e. fire). A number of 1980s-vintage tritium-bearing components are stored for surveillance at WETF in credited containment vessels known as Standard Tubs. As a credited containment vessel, the MAWP of Standard Tubs is required to be defined and protected. Since 2008, the WETF facility has been operating under a JCO associated with these containment vessels.

WETF personnel now plan to disposition these vessels by packaging them in Flanged Tritium Waste Containers (FTWCs) and shipping them to Area G for disposal. Earlier this month, LANL requested an extension to the JCO for the Standard Tubs to April 20th to allow completion of the overpacking activity. The activity will include loading, closure, leak checking and over-packing the FTWCs for transport to Area G for disposal. WETF personnel have procured the required equipment, developed procedures and trained operators. A management self assessment was recently completed and WETF personnel plan to begin a contractor readiness assessment on Monday. In addition, the laboratory has completed a system adequacy analysis of the FTWC and requested a safety basis change to use these containers to package existing tritium containment vessels with vulnerabilities (including the Standard Tubs).

To support shipment and disposition of the tritium-bearing Standard Tubs inside FTWCs at Area G, LANL has also completed waste disposal reports and a risk analysis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 30, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending March 30, 2012

Area G: The Area G TSRs credit overburdens as design features to protect low level waste in disposal pits from accident conditions that could cause the material to be dispersed. The design feature requires, “6 inch minimum fill material overburden on exposed low level waste pit layer – operational cover for active pit.” Last week, a site office Facility Representative questioned why an exposed portion of an active low level waste pit at Area G was not covered by an overburden.

Area G personnel had historically interpreted language from the accident analysis in the Area G DSA to conclude that the overburden design feature was only applicable when greater than 500 PE-Ci of low level waste was exposed in an active waste pit. Since far less than 500 PE-Ci was exposed in the pit observed by the Facility Representative, Area G personnel did not believe the overburden was required. This week, upon evaluation, Area G management concluded that the 500 PE-Ci applicability interpretation did not comply with the TSRs as written and suspended low level waste operations until a revision to the TSRs can be reviewed and approved by NNSA.

Radioactive Liquid Waste Treatment Facility – Upgrade (RLWTF-UP) Project: This week the site office provided NNSA-Headquarters a path forward for development and selection of safety basis controls for the RLWTF-UP Project. In July 2010, NNSA provided direction to LANL to re-evaluate options for this project to reduce cost. LANL subsequently recommended separating the transuranic and low-level waste processes into individual structures. The project path forward that includes separate facilities was accepted by NNSA in 2011. The low-level processing operations and common utilities would be located in a less-than-hazard-category 3 facility planned for completion in 2017. The transuranic processing operations would be located in a hazard category 3 nuclear facility planned for completion in 2020.

The path forward notes that LANL will be directed to identify anticipated engineered and administrative safety controls for the transuranic processing facility as part of the safety design strategy. The site office letter also notes that the quantity of transuranic liquid waste that requires processing has been low recently (averaging 6 to 9 Ci/year since 1994). Based on this low processing need, NNSA will also request LANL to perform an engineering study and make recommendations on alternate locations for the transuranic liquid waste processing portion of this project that considers expected mission need along with improved nuclear safety, waste minimization and life-cycle costs. This study may obviate the need to collocate hazard category 3 and radiological operations.

Plutonium Facility: This week, LANL transmitted a positive Unreviewed Safety Question determination to the site office associated with the refueling of an underground diesel fuel tank that supplies a pump house for the safety class Plutonium Facility fire suppression system. The following compensatory measures remain in place for this issue: refueling of the underground diesel fuel tank only when required, refueling operations will be performed under a work package that includes a fire watch and traffic control, training for personnel that perform the refueling operation and ensuring refueling vehicles meet safety basis requirements.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 6, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 6, 2012

Area G – Safety Basis: The Area G safety basis includes a TSR-level control to ensure the inventory of exposed low level waste in active disposal pits does not exceed 500 ²³⁹Pu-equivalent curies (PE-Ci). Surveillances are required to be performed quarterly to verify compliance with this low level waste inventory limit. In September 2011, Area G management declared a TSR violation based on a failure to satisfactorily perform the low level waste inventory surveillance within its required periodicity. The September 2011 violation was based on a discovery that the implementing procedure for the low level waste inventory surveillance directed operators to obtain inventory data from a database that was no longer being updated with real-time low level waste inventory information. The TSR violation resulted from the credited surveillance being performed using inaccurate inventory data. In response to this violation, Area G management identified a corrective action to revise the surveillance procedure to query a different data source that contained accurate low level waste inventory information.

This week, Area G personnel discovered that the key corrective action from the September 2011 TSR violation had not been effectively implemented. Although the low level waste inventory surveillance procedure had been revised, it continued to direct operators to obtain inventory data from the same database that is not updated to reflect accurate low level waste inventory information. As a result, the last two credited quarterly surveillances were again performed using inaccurate inventory data. This discovery prompted Area G management to declare another TSR violation. Based on the repeat nature of this violation, Area G management intends to evaluate its existing corrective actions and issues management process to identify and address weaknesses.

Plutonium Facility - The NNSA site office issued a Condition of Approval for the 2008 Plutonium Facility DSA that required LANL to establish a process to evaluate criticality safety controls for inclusion in the DSA, per DOE-STD-3007. As LANL personnel developed modern and compliant criticality safety evaluations, they have used criteria from the Standard to identify a set of criticality safety controls that will be formally credited in the next annual update of the DSA and TSRs.

This week, LANL personnel performing their annual criticality safety process review discovered a safe storing fissile material that did not appear to comply with the requirements of its Criticality Safety Limit Approval (CSLA) document and associated posting. The CSLA requires the safe to remain upright in a seismic event. Additionally, the safe's ability to remain upright in a seismic event was deemed important enough to be credited as safety significant (per DOE-STD-3007) in the next annual update of the DSA and TSRs. The safe is currently mounted on rolling casters and this configuration has not been analyzed to survive a seismic event without toppling. This discovery led to the declaration of a criticality safety infraction and facility management initiated an extent of condition review to identify any similar situations that may exist in the Plutonium Facility. This issue has also been entered into the New Information process to determine whether a Potential Inadequacy of the Safety Analysis exists. As part of this review, facility personnel will evaluate whether a seismic vulnerability for this safe is covered under existing supplementary safety basis documents that address known Plutonium Facility seismic vulnerabilities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 13, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 13, 2012

Staff member R. Verhaagen was onsite this week.

Plutonium Facility – Fire Suppression System: This week, LANL began construction on upgrades to a portion of the fire suppression system sprinkler piping to meet Performance Category-3 (PC-3) seismic requirements. In response to Board Recommendation 2009-2, NNSA developed a Project Execution Plan (PEP) to complete a set of Plutonium Facility upgrades that ensure mitigated offsite dose consequences do not challenge the DOE Evaluation Guideline. The fire suppression system upgrades are a key component of this effort and are scheduled to be complete in Fiscal Year 2013. The initial upgrades that have started will help LANL validate cost estimates while designs to upgrade other portions of the system continue development. LANL is also developing design packages and upgrade plans for electrical components that will be used to support the safety class/PC-3 active confinement ventilation capability consistent with the PEP submitted to the Board.

Plutonium Facility – Safety Basis: As reported last week, Plutonium Facility personnel recently discovered a material storage safe equipped with rolling casters that was required by its Criticality Safety Limit Approval to remain upright and in position during a seismic event. In accordance with DOE-STD-3007, the safety function of the safe to remain upright in a seismic event has been deemed sufficiently important to criticality safety to be elevated to the TSR-level in the next annual update of the Plutonium Facility safety basis. Facility personnel have identified three other safes that are currently in-service and storing material that have similarly important seismic requirements that are not yet implemented. This week, Plutonium Facility personnel determined that the situation represented by these safes is not explicitly covered under existing supplementary safety basis documents that address known seismic vulnerabilities for safety class and safety significant controls. In response, Plutonium Facility management declared a Potential Inadequacy of the Safety Analysis and implemented compensatory measures to physically restrain the movement of one safe and to prohibit metal storage in the other safes to limit the reactivity of any configuration that could be caused by physical rearrangement of stored materials due to seismic upsets.

Chemistry and Metallurgy Research (CMR) Building: LANL identified a potential criticality safety over-mass condition for a transuranic waste drum at CMR this week. The waste drum was loaded and stored at the facility several years ago with plutonium content recorded by the generator that exceeds the criticality safety limit. During preparations to ship drums to Area G for disposition, facility personnel noted that the generator data for the drum in question identified a plutonium content that exceeded the WIPP waste acceptance criteria but did not initially recognize the potential criticality safety concern. Non-Destructive Assay (NDA) at CMR to evaluate the drum contents indicated significantly lower plutonium content than the generator data. A CMR criticality safety engineer subsequently recognized the potential over-mass condition during a review and appropriate actions were taken to isolate the drum and evaluate the situation. Other corrective actions include the development of a recovery plan to examine and repackage the drum contents and to reconcile the difference in generator data and NDA results.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 20, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 20, 2012

Plutonium Facility: The Plutonium Facility safety basis credits a TSR-level material at risk (MAR) limit of 7500 g Weapons-Grade Pu (WG-Pu) equivalent for individual containers outside of gloveboxes. Plutonium Facility personnel use a software program called MAR Tracker to perform this and other required MAR limit surveillances in the facility. This week, a system engineer discovered an error in MAR Tracker that caused only a small subset of applicable facility containers (roughly 1700 out of 13000 containers) to be checked during the required annual MAR surveillance. This week, facility management declared a TSR violation based on this discovery.

In response to this TSR violation, normal operations have been terminated and the Plutonium Facility has been placed in Standby Mode. Facility personnel have revised the surveillance procedure to allow compliance with container MAR limits to be verified manually, rather than automatically using MAR Tracker, and teams of individuals are working to perform surveillances on all 13000 applicable containers. To date, fifteen containers, all housed in the facility's vault, have been identified with contents that exceed the MAR limit of 7500 g WG-Pu equivalent.

The MAR Tracker error was introduced during software development. To perform surveillances, MAR Tracker imports data from the laboratory's Material Control and Accountability (MC&A) inventory database. The MAR Tracker error resulted from a miscommunication between software developers and security personnel over how to recognize inventory data that corresponded to containers in the MC&A database.

Transuranic Waste Operations: Area G management identified a concern this week with the completion of a TSR surveillance requirement for receipt and placement of low level waste in disposal shafts. The surveillance requires verification that exposed waste inventory is less than 1200 plutonium equivalent curies prior to placement of new waste in a shaft. This surveillance is implemented by a procedure that requires documentation of completion in the waste inventory log book. Although Area G operators noted that the surveillance was completed prior to placement of waste, no log book entries have been made for the surveillance since 2010. As an immediate action, Area G personnel confirmed that all shafts contained less than the inventory limit. The inventory procedure is being revised to address this issue and another low level waste inventory issue identified earlier this.

This week, LANL completed the "red team" review for drum venting operations in Dome 33 of Area G. Red team reviews, which include a senior team of subject matter experts, have been successfully used recently at Area G to assess and improve the state of readiness for startup and restart of activities prior to moving forward with contractor and federal readiness assessments. LANL plans to resume drum venting at Area G later this year in a remote configuration using a containment structure and operator standoff requirements during key venting operations. Drum venting at Area G has not been performed since 2008. The red team completed a thorough review and identified a number of concerns and recommendations in the areas of nuclear safety, operations, maintenance, training and qualification, emergency management, engineering and other areas. Contractor and NNSA readiness assessments are scheduled for May and July, respectively.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 27, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending April 27, 2012

Transuranic Waste Operations: Last week, Area G management discovered that criticality safety controls had not been implemented for Fiberglass Reinforced Plywood (FRP) boxes, as required by the Area G Criticality Safety Program. A Criticality Safety Limit Approval (CSLA) for transuranic waste receipt and staging required FRP boxes with greater than 325 Fissile Gram Equivalents (FGE) to be specially controlled. Area G personnel identified five above-ground FRP boxes and one other oversized container that each held greater than 325 FGE, but did not comply with applicable criticality safety controls. In response, Area G management declared a level 3 criticality safety infraction (indicating a total loss of the safety parameter for mass control) and restricted access to areas where the high FGE containers were staged.

To address this discovery, LANL criticality safety personnel analyzed the existing configurations of the over-massed containers and concluded that no special action was necessary to segregate or isolate the affected containers. Area G management removed access restrictions based on this criticality safety analysis. Also as part of the response to this discovery, laboratory personnel found that the CSLA for FRP box processing operations in Building 412 did not evaluate the potential for FRP boxes to have FGE inventories in excess of 1000 g, which is a known condition for the bounding FRP box. The discovery of this CSLA deficiency prompted facility management to declare a Potential Inadequacy of the Safety Analysis (PISA).

Weapons Engineering Tritium Facility (WETF): This week, LANL identified concerns with the performance of a semi-annual TSR surveillance for the safety significant Halon fire suppression system at WETF. As part of this surveillance, WETF personnel verify that the squib actuator valves have not exceeded their service life (five years). Recent performance of this surveillance indicated that the squib valve had potentially exceeded five years and that the previous surveillance recorded the incorrect manufacturer qualification date, which is the basis for evaluating the service life. Although subsequent information indicated that the squib valve was not beyond its service life, the issue highlighted concerns with the conduct of this surveillance. WETF management is developing corrective actions to improve the procedural performance of this TSR surveillance.

WETF recently transitioned from warm standby to operations mode to support the disposition of four tritium containers (Standard Tubs) that may exceed their maximum allowable working pressure under accident conditions. These containers are being overpacked into Flanged Tritium Waste Containers (FTWCs) that will be transferred to Area G for disposal. Currently one FTWC has been loaded and successfully leaked checked to support transfer to Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 4, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 4, 2012

Plutonium Facility: Plutonium Facility management has submitted for site office review and approval a temporary safety basis modification that would allow three types of containers to be credited with damage ratios of less than one. The temporary safety basis modification package requests that the functional classification of Hagan, SAVY-4000, and 3013 containers be upgraded from their current designation of safety significant to safety class and that damage ratios of 5%, 1%, and 0%, respectively, be credited for these containers based on the results of thermal and mechanical insult testing. Upgrading these container types to safety class with damage ratios much less than one will allow facility personnel to address the recent discovery of 17 containers stored in the vault that exceed the TSR-level individual container material-at-risk limit. Many of these 17 items are already stored in Hagan, SAVY-4000 or 3013 containers, and all but one of the remaining items (a 55-gallon drum) can be overpacked into one of these containers to restore compliance with the TSR limit. LANL personnel intend to capture these three container types as safety class in the 2012 DSA Annual Update and retire the temporary safety basis modification.

Weapons Engineering Tritium Facility (WETF): As discussed last week, LANL is overpacking four Standard Tub containers into Flanged Tritium Waste Containers (FTWCs) for disposal at Area G. Although all containers have now been overpacked, only one of three FTWCs has passed the required leak test. Based on discussions with the vendor, WETF personnel have increased the torque used on the container and will re-perform the leak check on one of the remaining FTWCs early next week.

This week, WETF management declared a Technical Safety Requirement (TSR) violation based on the failure to appropriately perform a TSR surveillance for the battery associated with the safety significant Halon fire suppression system. Based on questions from an NNSA facility representative, WETF personnel concluded that the recently completed surveillance for the battery discharge test was not performed consistent with the description of the surveillance in the bases section of the TSR. In February, WETF completed implementation of a safety basis update that included changes to the TSR bases for this surveillance. The revision includes requirements for a 24 hour discharge period followed by a five minute full fire alarm load test. Previously (and during the most recent surveillance), facility personnel performed the battery discharge test using an accelerated discharge device consistent with a site-wide preventive maintenance procedure. WETF is revising the surveillance procedure to be consistent with the TSR description and developing corrective actions for this issue.

Safety Basis: During last year's Las Conchas fire, aircraft were used as part of the overall wildland firefighting and containment effort. This week, LANL management responded to an NNSA site office request by submitting an evaluation of aircraft crash probabilities for firefighting aircraft. Laboratory analysts concluded that crash probabilities did not exceed 10^{-7} per fight directly over a nuclear facility and therefore no additional controls are necessary to protect LANL nuclear facilities from firefighting aircraft crashes.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 18, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 18, 2012

Weapons Engineering Tritium Facility (WETF): This week, LANL successfully transferred three Flanged Tritium Waste Containers to Area G for disposal. This action reduces the material at risk in WETF and eliminates four containers that were the subject of a November 2008 Potential Inadequacy of the Safety Analysis (PISA) due to overpressure concerns during a fire accident scenario.

Radioactive Liquid Waste Treatment Facility (RLWTF): Last week, RLWTF management declared a PISA based on the discovery that the actual configuration of a portion of the transuranic liquid waste receipt and distribution system did not match the configuration described in the facility's safety basis. Transuranic liquid waste is received from the Plutonium Facility into one of two tanks in an underground reinforced concrete vault adjacent to the RLWTF. According to the RLWTF safety basis, the two transuranic liquid waste receipt tanks would overflow to a sump in the concrete vault and a manually operated pump could be used to transfer liquid from the sump to a portion of the system normally used to receive low level liquid waste. Facility personnel recently discovered that contrary to the safety basis description, the transuranic waste receipt tanks were plumbed to route overflowed material directly into a low level waste receipt tank and that the sump pump in the concrete vault would automatically (vice manually) transfer liquid from the sump to the low level waste receipt system. This configuration could result in an unplanned discharge of transuranic liquid into the low level liquid processing portion of the system.

In response to this discovery, RLWTF personnel have completed physical modifications to cause the two transuranic waste receipt tanks to overflow into the concrete vault sump, as described in the safety basis. Personnel are also in the process of modifying the vault sump pump and associated piping to manually transfer overflowed liquid into the transuranic rather than low level portion of the system.

Transuranic Waste Operations: On Tuesday, LANL submitted the Evaluation of the Safety of the Situation (ESS) to address criticality safety issues for Fiberglass Reinforced Plywood (FRP) box processing operations at Area G. Last month, LANL identified several above-ground FRPs (and one other oversized container) that exceed 325 Fissile Gram Equivalents (FGE) and were not specially controlled in accordance with the applicable Criticality Safety Limit Approval (CSLA). The ESS was written to address credible upset limits for the potential processing of these boxes in Building 412, which was not adequately addressed in the CSLA. The path forward identified in the ESS includes 1) not transferring containers to the processing line (a standing order has been issued) 2) a specific criticality safety evaluation will be performed prior to processing containers with greater than 325 FGE and 3) one box with uncertainty in the assay data that indicated greater than 1000 FGE will be re-evaluated (generator information indicates approximately 350 FGE).

Plutonium Facility: Last week, LANL submitted the ESS for safes that were not anchored consistent with criticality safety requirements. The ESS notes that all safes have now been anchored as required and that the safety basis will be updated to include requirements to anchor these safes in the next annual update.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 25, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending May 25, 2012

Staff members A. Hadjian, J. Kimball, J. Pasko and C. Shuffler were onsite this week to discuss the seismic analysis of the Plutonium Facility structure, systems and components.

Plutonium Facility – Seismic Safety: This week, NNSA and LANL personnel discussed the status and plans for completing the static non-linear seismic analysis of the Plutonium Facility. Following the completion of the Seismic Analysis of Facilities and Evaluation of Risk (SAFER) project review of the Plutonium Facility, LANL completed a series of facility upgrades to address identified vulnerabilities. NNSA and LANL also decided to perform a static non-linear seismic analysis to determine if other upgrades are required to support the safety function identified in the Documented Safety Analysis (maintain confinement integrity) and to identify whether additional collapse mechanisms need to be addressed. The staff expressed concern over certain inputs for this analysis and the details for modeling the service chase roof slab. LANL plans to perform testing this summer to better characterize the seismic performance for the service chase roof slab.

The site office also provided direction to LANL this week noting that the non-linear modeling needs to be completed expeditiously to determine if there are other deficiencies that need to be addressed in the near term. The letter requests a final report on the analysis by September with preliminary results in July and that NNSA be promptly notified if issues arise that delay this schedule. The letter also directs LANL to update the Plutonium Facility Seismic Project Execution Plan to include any additional out-year testing and analyses that are needed to address facility seismic concerns. While it is important to complete this work in a timely manner, NNSA and LANL need to ensure the results adequately evaluate the Plutonium Facility seismic performance to ensure any needed upgrades are identified and pursued.

Plutonium Facility – Safety Basis: On Friday, LANL requested and received approval of a one month delay in the schedule for implementation of the 2011 Documented Safety Analysis and associated Technical Safety Requirements (TSRs). The previously approved schedule for completion of this effort was May 25th. LANL identified issues and concerns with the implementation of the MAR tracker software, which is used to implement TSR controls for material at risk inventories.

Plutonium Facility – K2 Container Disposition Plan: Earlier this year, LANL provided NNSA with a disposition plan for the K2 containers that contain Plutonium-238 material received from Mound in the 1980's. Six of these containers are currently located in the vault water bath. The site office requested a disposition plan for the K2 containers as part of the closeout of a Potential Inadequacy of the Safety Analysis associated with miscellaneous vault water bath containers late last year. This material is particularly difficult to handle and repackage because of the high dose rates involved. LANL provided two options for disposition of this material as transuranic waste at WIPP. The first option would use existing pipe overpack containers to ship the material as contact handled waste. The second option would ship the material as remote handled transuranic waste and requires development of a shielded container. LANL plans to pursue both of these options in parallel with a schedule for completion in the 2018 timeframe. The site office requested LANL to include these plans in the safety basis during the next annual update and to pursue funding for this activity beginning in 2014.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 1, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 1, 2012

Weapons Engineering Tritium Facility (WETF): This week, WETF management declared a Potential Inadequacy of the Safety Analysis (PISA) due to non-conservative oxygen readings for the Oxygen Monitoring System (OMS). The safety significant OMS is used to monitor oxygen concentrations in the Tritium Waste Treatment System Low Pressure Receiver (LPR) and the Tritium Gas Containment System (i.e. gloveboxes). During a review of a 2010 calculation last week, WETF management identified that OMS readings are dependent on pressure at the oxygen sensor and would indicate non-conservative values (i.e. less than the actual oxygen concentration) if the pressure at the sensor fell below the calibration pressure (the OMS is calibrated at atmospheric pressure).

For the LPR, a sample loop that includes a back pressure regulator is used to monitor LPR contents; however, the regulator failed several years ago and has not been repaired or replaced. A manual bypass valve that bypasses the regulator has been used to maintain a back pressure on the oxygen monitor since that time, but there is no surveillance for this pressure and the oxygen monitor's pressure dependence is not addressed in the safety basis. In addition, the setpoint calculation for the OMS does not address pressure uncertainty. Evaluation of this pressure, which is periodically recorded by a facility control system, indicates that the pressure at the sensor has routinely been well below atmospheric pressure. After this issue was recognized last week, the OMS was declared inoperable for both the LPR and glovebox systems and appropriate TSR Limiting Conditions for Operation were entered.

Transuranic Waste Operation: As part of Area G closure activities, LANL plans to startup Fiberglass Reinforced Plywood (FRP) box processing operations in Dome 375 and in the Dome 231 Permacon later this year (box processing is currently performed in Building 412). LANL has constructed a new larger Permacon containment structure in Dome 375 and plans to revise the safety basis to include processing greater than Hazard Category (HC) 2 quantities of waste in this Permacon. Area G personnel plan to perform a concurrent contractor readiness assessment in October for both the Dome 231 and Dome 375 operations prior to processing FRP boxes with greater than hazard category 3 quantities. A federal readiness assessment will be conducted for HC 2 operations in Dome 375.

Safety Basis: Last week, NNSA NA-1 Supplemental Directive Guide 1027, *Guidance on Using Release Fraction and Modern Dosimetric Information*, was formally added to the prime contract for management and operation of LANL. Among other things, this Supplemental Directive uses updated dose conversion factors to modify the threshold inventory values used to determine when a facility must be classified as an HC 2 or 3 nuclear facility, which requires the development of a Documented Safety Analysis. The new inventory threshold values generally allow more radiological material to be present in a facility before it must be classified as HC 2 or 3 (for example, under the new guidance, a facility can contain up to 38g of Pu-239 or 26g of weapons-grade Pu and remain below the HC 3 nuclear facility threshold, up from 8.4g or 6g, respectively). The NNSA site office has requested that laboratory management submit an implementation plan for applying the Supplemental Directive before any changes are made based on the new guidance. Ultimately, several LANL facilities including the Radiological Laboratory and Utility Office Building are expected to attempt to invoke the new inventory threshold values to allow a greater quantity of material to be present in the facility while remaining less than HC 3.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 8, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 8, 2012

Plutonium Facility: On Friday, Plutonium Facility management formally declared the 2011 Documented Safety Analysis (DSA) and associated Technical Safety Requirements (TSR) to be implemented. Prior to declaring implementation, facility personnel closed all pre-implementation findings from an independent Implementation Verification Review (IVR) conducted in May. Chief among the recent actions to close IVR findings was completion of verification and validation activities for changes to the safety-related Material at Risk (MAR) Tracker software and successful performance of all TSR-level MAR surveillance requirements using MAR Tracker. This week's implementation of the 2011 DSA and TSRs retires the 2008 DSA and TSRs and the 2011 Justification for Continued Operation that addresses seismic vulnerabilities of the facility structure.

Federal Oversight: This week, the office of the NNSA Chief of Defense Nuclear Safety (CDNS) completed their biennial review of the Los Alamos Site Office. The CDNS team noted significant improvement in overall performance since the prior review in 2009 with objectives met in all functional areas. Findings were identified in a number of areas; however, significant previous issues identified in 2009 for Maintenance and Startup and Restart of Nuclear Facilities were judged to be adequately resolved. The team also noted that contractor weaknesses in several areas indicate a need for continued strong performance by the site office.

Area G – Safety Basis: This week, the site office responded to the Evaluation of the Safety of the Situation (ESS) and Unreviewed Safety Question Determination (USQD) for criticality safety issues associated with Fiberglass Reinforced Plywood (FRP) box processing and storage at Area G. In April, LANL identified several above-ground FRP boxes that exceed 325 Fissile Gram Equivalents (FGE) and were not specially controlled in accordance with the applicable Criticality Safety Limit Approval document. The USQD performed by LANL was determined to be negative; however, the site office response does not agree with this result because they believe this information could “increase the probability of occurrence of an accident previously evaluated in the facility's documented safety analysis.” The site office concurs with the ESS and requests that LANL re-evaluate the USQD. Consistent with the ESS, LANL will perform a specific criticality safety evaluation prior to processing containers with greater than 325 FGE.

Transuranic Waste Operations: This week, the 1,000th shipment of LANL-generated transuranic waste was sent to the Waste Isolation Pilot Plant in Carlsbad, NM. Also, LANL work to support the Framework Agreement between NNSA and the New Mexico Environmental Department is currently proceeding ahead of schedule in terms of volume shipped, ²³⁹Pu-equivalent curies shipped, and total shipments. To support near-term Framework Agreement work scope, LANL personnel expect to complete field work this month on the installation of a new large Permacon structure in Dome 375 and upgrades to a smaller existing Permacon structure in Dome 231, both at Area G. These Permacons will house FRP box processing lines similar in nature to the processing line currently operating in Building 412 at Area G. This month, LANL personnel also plan to resume drum venting operations in Dome 33, using drums that contain less than Hazard Category 3 quantities of material (i.e. less than 0.52 ²³⁹Pu-equivalent curies).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 15, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 15, 2012

Technical Area-35 (TA-35): This week, LANL identified a number of fuel rods in TA-35 Building 27 that are not consistent with the criticality safety evaluation for the facility. Operations at this building had previously been suspended in late-May due to the discovery of three fuel rods that were not in the facility or institutional tracking systems. Operations remain suspended pending development and implementation of corrective actions, including site office approval of these actions.

TA-35 Building 27 is categorized as a radiological facility per DOE Standard 1027 and conducts detector experimental activities. In 2011, LANL responded to concerns about the hazard categorization of this building because the amount of material inventory exceeds the Standard 1027 threshold based on criticality safety concerns. LANL concluded that the “nature of the process” for activities conducted in Building 27 precludes criticality consistent DOE supplemental guidance for Standard 1027. A criticality safety evaluation and criticality safety limit approval were developed to describe facility activities related to criticality safety and capture the “nature of the process” argument.

Earlier this year, site office personnel identified concerns with the implementation and basis for these conclusions at TA-35. LANL subsequently developed a programmatic improvement plan to address criticality safety implementation for Building 27. However, these latest issues and concerns indicate the need to revisit the building mission, hazard categorization, or strengthen the “nature of the process” arguments for the building. Programmatic operations at TA-35 Building 27 will remain suspended until LANL develops a corrective action plan that is approved by the site office.

Transuranic Waste Operations: The Area G senior readiness review board reviewed closure of Management Self Assessment pre-start findings and recommended start-up of drum venting operations for less than hazard category 3 quantity drums this week. Contractor and federal readiness assessments are scheduled to be performed prior to conducting operations at greater than hazard category 3 quantities.

Radioactive Liquid Waste Treatment Facility (RLWTF): On Wednesday, LANL submitted the Evaluation of the Safety of the Situation (ESS) to the site office for the Potential Inadequacy of the Safety Analysis (PISA) associated with the configuration of the transuranic liquid waste receipt and distribution system. LANL’s evaluation concluded that this issue does not represent an Unreviewed Safety Question. The ESS notes that LANL has completed physical modification to eliminate potential interactions between the transuranic and low level waste systems. Based on submittal of the ESS, RLWTF management will remove operational restrictions that were identified as part of the PISA.

Area G – Safety Basis: This week, the site office approved a revision to the Area G Documented Safety Analysis and Technical Safety Requirements. This revision, which was submitted last week, includes clarifications for the material at risk for exposed waste in pits and shafts and overburden requirements for buried waste. The site office approval identifies a concern with the exposed radioactive waste inventory in active shafts and pits and requests LANL to evaluate using the new information process.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 22, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 22, 2012

Staff members Dunlevy, Futrell, Johnson, Pasko and Sharpless were onsite this week to review the Area G Basis for Interim Operation that is scheduled to be implemented by September 30, 2012.

Transuranic Waste Operations: This week, facility management discovered a significant breakdown in inventory control and material at risk (MAR) tracking for several locations in Area G. The facility uses a software database to track the physical location of transuranic waste inventory and to protect TSR-level MAR limits for defined areas and facilities inside Area G. When moving transuranic waste from one location to another, Area G operators use hand-held barcode scanners to update the location of inventory in the software database to ensure that applicable MAR limits will not be exceeded. A recent inquiry by an NNSA facility representative prompted the discovery of significant discrepancies between inventory information in the database and the actual inventory present in several locations including Pad 10 characterization facilities and the waste storage dome used to house material awaiting characterization on Pad 10. Facility management also discovered that historical inventory records extracted from the database indicate that a TSR-level MAR limit for a characterization facility had been violated on multiple occasions within the past several months. This information led Area G management to declare a TSR violation.

In response, facility management suspended MAR movements within Area G and initiated walkdowns to re-establish an accurate physical inventory of transuranic material in all affected areas. The walkdowns did not identify any instances where the actual MAR in a location exceeded TSR limits. Area G management has allowed MAR movement to resume under a modified inventory tracking and control system that requires positive confirmation that the database was successfully updated after every barcode scanner transaction, as well as, the use of a redundant paper-based tracking system. Using this modified approach, issues have been identified where a barcode scanner indicates that information has been sent, but the inventory database is not updated. Area G personnel continue to investigate the root causes of the inventory control breakdown.

Quality Assurance: The Area G inventory control issue discussed above is the seventh TSR violation in the past 10 months that involve issues with software databases used to implement TSR-level controls in LANL nuclear facilities. The following is a summary of the recent database-related TSR violations: • August 2011 - WETF containerization program pressure limit, • September 2011 – Area G low level waste MAR limit, • December 2011 – Area G tritium MAR limit, • December 2011 – WETF combustible loading limit, • April 2012 – Area G low level waste MAR limit, • April 2012 – Plutonium Facility MAR limit, • June 2012 Area G transuranic waste MAR limit.

Weapons Engineering Tritium Facility (WETF): This week, LANL submitted a Justification for Continued Operation (JCO) to address non-conservative oxygen readings for the Oxygen Monitoring System (OMS) at WETF. In late-May, WETF identified that the OMS readings are dependent on the pressure at the oxygen sensor and declared a Potential Inadequacy of the Safety Analysis. The JCO includes a weekly surveillance to verify that the pressure at affected OMS sensors is within the required range and an annual surveillance to calibrate the pressure instrumentation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 29, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending June 29, 2012

Staff member R. Tontodonato was onsite this week to attend an Integrated Nuclear Planning workshop. During the workshop, personnel from NNSA and LANL discussed the progress and plans for transuranic waste operations and, in particular, the 3706 m³ campaign to disposition higher risk (i.e. combustible and/or dispersible) above-ground transuranic waste at Area G.

Chemistry and Metallurgy Research Building (CMR): Laboratory personnel have been working for years to design, test and install equipment in Wing 9 of CMR to safely retrieve and disposition radiological material from nine large metal confinement vessels currently staged at the Plutonium Facility. Project personnel have now fielded all Confinement Vessel Disposition project hardware in Wing 9, including a Permacon enclosure equipped with fire suppression and HEPA-filtered ventilation, a seismically-qualified confinement vessel support stand, a glovebox workstation that will be mated to confinement vessels, and a robotic arm that will be used to remotely remove material and decontaminate the interior of confinement vessels.

This week, laboratory personnel issued a final report documenting the results of an Implementation Verification Review (IVR) whose primary purpose was to validate the implementation of Confinement Vessel Disposition-related Technical Safety Requirements (TSRs). The IVR identified three pre-implementation findings, all of which were addressed and closed during the review. After successful completion of the IVR, Confinement Vessel Disposition project management had intended to begin formal startup activities including a Management Self Assessment, contractor Operational Readiness Review, and federal Operational Readiness Review. However, these required startup activities appear likely to be deferred to FY13 due to funding issues.

Safety Basis: LANL management has submitted, for NNSA site office concurrence, a technical justification to continue using a deposition velocity of 1 cm/s for accident analysis calculations of unfiltered/unmitigated releases at LANL facilities. The LANL justification argues that non-conservatism associated with the 1 cm/s deposition velocity is offset by over-conservatism in the default values for dispersion coefficients (σ_y and σ_z) used in the MELCOR Accident Consequence Calculation System, Version 2 (MACCS2) computer code employed to calculate χ/Q values.

Weapons Engineering Tritium Facility (WETF): This week, the site office responded to the Evaluation of the Safety of the Situation (ESS) and Justification for Continued Operation (JCO) for non-conservative oxygen readings associated with the Oxygen Monitoring System (OMS). The site office approved the ESS but did not approve the JCO. The LASO letter directs LANL to revise the WETF TSR document so that the low-pressure receiver remains in warm standby until the OMS is declared operable. LANL was also directed to submit a TSR revision that clearly defines the conditions for OMS operability, which should account for pressure sensitivity. The low-pressure receiver will remain in warm standby until the TSR revision is approved and implemented at WETF.

LANL also submitted a revision to the WETF safety basis strategy this week that defines the plan for submittal of an upgraded Documented Safety Analysis and TSRs. The strategy states that the upgraded safety basis will be submitted to the site office for approval by August 15, 2012.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 6, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 6, 2012

Weapons Engineering Tritium Facility (WETF): On Tuesday, WETF management identified that the semi-annual Oxygen Monitoring System (OMS) surveillances are performed after replacement and calibration of the oxygen sensors, which may not be consistent with the Technical Safety Requirements (TSRs). Performance of the surveillance after a new sensor is calibrated does not provide information on the performance of the previous sensor. The TSR surveillance identifies that operators should “VERIFY” OMS performance, which does not allow operator manipulation. Upon discovery, WETF management conservatively concluded that this issue represented a TSR violation and plans to critique the issue on Monday.

Technical Area-35 (TA-35): Last week, LANL submitted a corrective action plan to the site office for recovery from recent criticality safety issues identified at TA-35, including the discovery of three unaccounted for fuel rods in May and identification of fuel rods with active lengths that may exceed the length identified in the criticality safety evaluation in June. The plan includes compensatory actions and a path forward to ensure proper accounting and disposition of the fuel rods; however, it did not incorporate actions required to respond to a recent site office memo on the TA-35 criticality safety issues. The LASO memo requests that LANL evaluate the following three options: 1) deinventory sufficient fuel rods to preclude criticality concerns; 2) upgrade the hazard categorization of certain facilities in TA-35 to hazard category 2; or 3) improve the “nature of the process” arguments that allow these TA-35 facilities to be radiological (i.e. less than hazard category 3) facilities per DOE Standard 1027. The site office did not take action on the LANL corrective action plan and instead requested that LANL incorporate the actions and path forward into a recovery plan that adequately addresses all LASO requested actions. Programmatic operations associated with these fuel rods remain suspended pending LANL development and site office approval of a recovery plan.

Nuclear Safety: This week, the Laboratory Director provided a final response to a September 2011 NNSA site office letter requesting action to improve nuclear safety and operations. In this response, the Director provides the results of laboratory causal analysis of four key identified problem areas: • Why are Technical Safety Requirement (TSR) violations occurring? • Why are criticality safety infractions occurring? • Why are issues and deficient conditions, which should be discovered by LANS personnel, being found by NNSA Facility Representatives and other outside groups? • Why do personnel have difficulty executing procedures and work packages? The LANL analysis rolls up identified deficiencies and causal factors into five judgments of need related to: 1) Strengthening management emphasis on Nuclear Safety Culture, self-discovery, reporting free from fear of retaliation, and continuous improvement; 2) Improving clarity and understanding of roles, responsibilities, authority, and accountability; 3) Enhancing issues management with corrective actions directed at causes rather than symptoms to support continuous improvement; 4) Elevating management attention on the training and qualification program; and 5) Improving effectiveness of technical procedures as tools for workers. In the response, the Director also announced the establishment of a Senior Executive Committee on Nuclear Safety that will be chaired by the Associate Director for Nuclear and High Hazard Operations. This committee will be responsible for addressing the five identified judgments of need and directing future improvements to nuclear safety and operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 13, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 13, 2012

Software Quality Assurance: This week, LANL provided the site office with a plan to evaluate issues and develop an improvement plan for recent software quality assurance issues related to Technical Safety Requirement (TSR) violations. As noted in the June 22nd weekly report, there have been 7 TSR violations in the past year that involve issues with software databases used to implement TSR-level controls at LANL nuclear facilities. The LANL plan includes gathering and evaluating historical data by July 20th and developing an improvement plan by August 17th.

Weapons Engineering Tritium Facility (WETF): This week, WETF management declared a TSR violation related to the facility's credited Pressure Safety Program. WETF TSRs state that components of the safety significant tritium waste treatment system are required to comply with pressure safety provisions in the LANL Engineering Standards Manual. In a number of cases, formal variances to the manual's pressure safety requirements were issued to establish interim compliance while system modifications could be executed to achieve full compliance. Each pressure safety variance has an expiration date and the institutional engineering organization that administers the program issues tags to hang on systems that indicate when variances expire. However, when a single system has multiple pressure safety variances, the variance tag for that system is issued with an expiration date that corresponds to the last expiration date of any individual variance. At WETF, engineers relied on the expiration date on the tag to track compliance with variances. This week, personnel recognized that although they had not reached the expiration dates reflected on any variance tags, at least one individual variance had expired. As a result, the tritium waste treatment system did not comply with TSR-level pressure safety requirements. Facility personnel are conducting an extent of condition review and working to improve the variance tracking and tagging system.

Plutonium Facility: On Tuesday, a Plutonium Facility worker was discovered to have alpha contamination on his left wrist (2,000 dpm) and wrist watch (10,000 dpm) after performing maintenance activities in an Automated Recovery and Integrated Extraction System (ARIES) glovebox. After completion of maintenance activities for the day, the worker alarmed the hand and foot monitor when exiting the room. The responding radiological control technician identified the personnel contamination, contamination on the personal protective equipment of another worker and contamination in the room. Appropriate actions were taken to respond to the personnel contamination and to isolate the lab room.

Plutonium Facility procedures require workers to monitor their hands and arms for contamination after removal from glovebox gloves. The particular glovebox where the maintenance was being performed is equipped with two newer cordless contamination monitoring devices. During the critique for this event, it was identified that these cordless probes are powered by a capacitor that maintains power for a limited time after being removed from the charging cradle on the glovebox. Workers for this maintenance activity had removed the probe and placed it on a nearby table to perform hand monitoring after exiting from the glovebox and were not aware that the probe would become de-energized and inoperable if not returned to the cradle. LANL management is developing corrective actions and plans to communicate a complex-wide lessons learned to ensure other sites are aware of the limitations for this type of cordless contamination monitor.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 20, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 20, 2012

Staff member R. Verhaagen was onsite this week.

Technical Area-35 (TA-35): This week, the site office approved a recovery plan to address the discovery of fuel rods at TA-35 Building 27 and the identification of fuel rods with active lengths that may exceed the length identified in the criticality safety evaluation. The LANL plan details a two phased approach to ensure adequate implementation of the criticality safety program at TA-35 Buildings 2 and 27 including improvements to the “nature of the process” arguments and controls consistent with recent direction from the site office. Phase 1 of the recovery plan includes 1) performing a wall-to-wall inventory of materials and sealed sources in Building 27; 2) ensuring fuel rods are included in accountability and tracking systems; and 3) verifying that the inventory meets criticality safety requirements. LANL is scheduled to have a corrective action plan for Phase 1 by August 13th.

The 2nd Phase of the recovery plan details LANL’s actions to ensure adequate and sustainable implementation of the nuclear criticality safety program at TA-35 Buildings 2 and 27. This effort includes updating the Facility Hazard Categorization and criticality safety evaluation documents, creating a systematic approach to operator training, and implementing improved inventory and access controls. LANL is scheduled to have a detailed implementation plan for Phase 2 by November 22nd. The site office approved the recovery plan subject to several comments, one of which states that programmatic operations involving fuel rods in racks and operations with sources underwater are precluded until completion of Phase 2 activities.

Transuranic Waste Operations: The safety basis for the RANT shipping facility credits a pre-action dry pipe fire suppression system (FSS) as a safety significant control. Preventive maintenance on this system has historically been performed using a generic maintenance work instruction that did not account for differences between RANT’s pre-action dry pipe FSS and more common wet pipe FSSs used elsewhere at LANL. In 2010, personnel using the generic work instruction inadvertently caused the RANT FSS to charge with water during a preventive maintenance evolution. In response, facility management defined a corrective action intended to prevent recurrence. When this corrective action was ultimately implemented in June 2012, facility personnel used an operator aid posting to capture several system manipulation steps necessary to ensure the RANT pre-action system is properly aligned to support maintenance. Personnel involved in developing and posting the operator aid were not aware that the Conduct of Operations Manual prohibits the use of operator aids to alter or contradict procedures. Additionally, one of the steps in the operator aid was incorrect and would actually cause a valve misalignment.

Last week, personnel performing preventive maintenance on the RANT FSS followed the steps on the operator aid and the resulting valve misalignment charged the system with water. In response to this event, facility management had the operator aid removed, directed that appropriate procedures and work instructions be revised to appropriately account for features specific to the RANT FSS, and chartered the development of continuing training to strengthen Conduct of Operations awareness and understanding for transuranic waste operations personnel and management.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 27, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending July 27, 2012

Staff member R. Verhaagen was onsite this week.

WCRR Repackaging Facility – Safety Basis: This week, WCRR repackaging facility management declared a Technical Safety Requirement (TSR) violation based on the failure to perform a required surveillance within its prescribed frequency. The WCRR TSRs require a weekly combustible loading surveillance to be performed in and around outdoor transportainers used to stage transuranic waste drums awaiting processing or shipment. This surveillance requirement, which came into effect in January 2012, is implemented as a part of the performance of facility rounds. Prior to January 2012, all of the TSR-level surveillance requirements implemented via rounds applied only to the interior of the WCRR building and no rounds-based surveillances were tied to the outside transportainers or the yard. As a result, operations personnel had historically not performed rounds when material at risk was removed from the WCRR building because no rounds-based surveillances were required when the building was in cold standby mode.

Problems with the WCRR drum lift have caused facility operations to be suspended and the building to be placed in cold standby mode for much of the last six weeks. Following past practice, operations personnel did not perform rounds while the WCRR building was de-inventoried and in cold standby mode. However, material at risk was present in the transportainers, meaning the associated combustible loading surveillance was required to be performed. This resulted in the weekly transportainer combustible loading surveillance to be missed on several occasions in June and July. In response, facility management is evaluating the extent of condition and developing corrective actions.

Weapons Engineering Tritium Facility (WETF): In July 2010, WETF successfully completed an NNSA Operational Readiness Review allowing the facility to restart programmatic tritium gas handling activities after an extended operational suspension. WETF personnel had been pursuing restart of the balance of the facility in a phased approach and planned to perform both contractor and federal readiness assessments in September and October 2012, respectively, to support tritium gas transfer operations from the function tester glovebox to the load-in glovebox. However, based on the time elapsed since the last gas transfer and function test operations (over 1 year), LANL is now proposing to include these operations as part of the upcoming readiness assessments. The LANL Joint Evaluation Team met this week to discuss the readiness plans for these operations and recommended both federal and contractor readiness assessments. LANL is revising the readiness assessment Plan of Action to be consistent with this approach. WETF management plans to resume programmatic tritium operations in November following successful completion of the readiness assessments.

Area G - Readiness: On Tuesday, the site office approved the LANL Plan of Action for the performance of the drum venting contractor readiness assessment that is scheduled to start on Monday. The site office manager has been delegated as the startup authorization authority for this activity. In June, Area G personnel completed a management self assessment and began venting drums with less than hazard category 3 material quantities. The readiness assessment team will observe venting operations with these type drums next week. A federal readiness assessment is also scheduled to be performed in September prior to beginning hazard category 3 operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 3, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 3, 2012

Mr. Broderick was out of the office this week.

Federal Oversight: On Wednesday, the site office sent a letter to LANL management on nuclear safety culture and operations. Earlier this month, LANL identified that the static gauge pressure for the fire suppression system at the RANT shipping facility drops below the Technical Safety Requirement (TSR) lower pressure limit (i.e. the surveillance requirement) under certain conditions of domestic water usage. Facility management entered the New Information Process to evaluate whether this issue constitutes a Potentially Inadequacy in the Safety Analysis; however, no compensatory actions were taken to preclude pressure drops and normal operations continued. The site office letter notes that allowing conditions such as this to continue can lead to “normalization of deviation” and that lack of immediate action is not consistent with LANL commitments to nuclear safety culture. As noted on July 6th, the laboratory recently established a senior executive committee on nuclear safety that will be responsible for directing improvements in nuclear safety and operations.

Weapons Engineering Tritium Facility (WETF): Last week, LANL submitted a significant update to the WETF Documented Safety Analysis (DSA) and TSRs along with the Fire Hazards Analysis, Upgrade Safety Basis Strategy and the Inputs, Methods and Assumptions document. Although LANL has revised and updated the previous WETF safety basis, this update represents a significant revision to the WETF DSA and TSRs. The revised safety basis document includes an inventory limit of 250 grams of tritium (including holdup) and the following safety class structures, systems and components: DOT Type B shipping package, facility structure, pressurized gas flow restrictors, qualified containment vessels, oxygen monitoring system and the wet pipe sprinkler system. The site office is currently reviewing this submittal package. LANL will develop an implementation plan within 30 days of the site office approval of the DSA and TSRs.

Facility Hazard Categorization: LANL recently requested site office approval to use NA-1 SD G 1027, *Guidance on Using Release Fraction and Modern Dosimetric Information Consistently with DOE STD 1027-92* for the Technical Area-48 RC-1 building, which is a radiological facility (i.e. material quantities less than hazard category 3 per DOE STD 1027-92). The submittal includes a revised facility hazard categorization document to demonstrate that RC-1 remains below hazard category 3 quantities using the NNSA guidance document. Consistent with direction from the site office, LANL has completed an impact assessment and programmatic implementation plan for use of this guidance. Site office approval of this request will allow LANL to increase material inventories in support of increased throughputs for the LANL Medical Isotope Program. LANL plans to pursue use of the NNSA guidance for other radiological facilities on a case-by-case basis with site office approval when there is a mission need.

Area G – Readiness: On Monday, LANL began the contractor readiness assessment for the drum venting system at Dome 33 in Area G. Field observations including conduct of an emergency drill were completed this week. The team plans complete their review and outbrief the results to site management next week. A federal readiness assessment is scheduled for September.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 10, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 10, 2012

Plutonium Facility: On Thursday, Plutonium Facility management declared two Potential Inadequacies of the Safety Analysis (PISAs) associated with the 2011 Documented Safety Analysis (DSA) post-seismic accident scenario. The first PISA is associated with the potential for a post-seismic fire in the facility basement. As part of the DSA evaluation, LANL performed a probabilistic analysis to determine the likelihood of a fire following a seismic event based on historical information. The evaluation identified a probability of a post-seismic fire per facility square foot. When using this value for the Plutonium Facility, the DSA only used the laboratory area and did not include the basement area.

The second PISA is associated with the leak path factor used for the accident scenario. The software calculation used as the technical basis for the leak path factor included material involved in both a spill and a fire that provides an integral result; however, the DSA uses different leak path factors for the contribution from a fire and spill. Both of these issues were identified by the Board's staff during a review of the DSA earlier this year and communicated to NNSA by Board letter on June 18, 2012.

Safety Basis: This week, the site office provided direction to LANL on use of deposition velocities for nuclear facility safety basis calculations. Previously, LANL recommended continued use of 1 cm/sec despite this value being non-conservative (the site specific calculation for the Transuranic Waste Facility Project was 0.4 cm/sec) because of other conservatism in safety basis calculations. The site office directed LANL to use a deposition velocity of 0.4 cm/sec for the Transuranic Waste Facility Project and to submit a resource loaded plan to identify reasonably conservative dispersion parameters for other facilities and projects in December.

Sealed Sources: Building 214 in Technical Area 36 is a radiological (i.e. less than Hazard Category 3) facility used to perform instrument calibration activities. A number of sealed sources are not counted against Building 214's radiological material inventory for facility hazard categorization purposes based on the sealed source exclusion provision of DOE-STD-1027. This week, facility management discovered that two cesium sources and one americium-beryllium source may not meet all applicable requirements to be excluded from the facility's inventory because these sources have exceeded their manufacturer-specified recommended working life. Adding these previously excluded sealed sources to the facility's inventory caused the Hazard Category 3 threshold to be exceeded. In response, facility management suspended affected operations and began executing proceduralized actions to address the inventory limit violation.

The Building 214 issue was discovered as part of an on-going extent of condition review that was prompted by a similar discovery in a Technical Area 16 facility in late May 2012. In response to the Technical Area 16 event where a facility exceeded its material inventory limit (and the Hazard Category 3 threshold) because two sealed sources were found to no longer meet inventory exclusion requirements, laboratory management took positive action to perform a systematic and thorough extent of condition review and to evaluate laboratory processes for tracking and managing sealed sources. This week's discovery at Building 214 underscores the importance of both successfully completing the extent of condition review and ultimately improving the laboratory's process for managing sealed sources that are excluded from facility inventory limits.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 17, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 17, 2012

This week, Board members Peter Winokur, Jessie Roberson, Joseph Bader and John Mansfield were onsite along with staff members Timothy Dwyer, Daniel Ogg, Richard Schapira, Matthew Duncan, John Pasko and Richard Verhaagen to meet with NNSA site office and LANL personnel. The Board had detailed discussions with site personnel on the Plutonium Facility, the Chemistry and Metallurgy Research Building, Transuranic Waste Operations (including Area G closure activities), the Weapons Engineering Tritium Facility, LANL design and construction projects and emergency preparedness. The Board also toured the Radiological Laboratory, Utility and Office Building and the Plutonium Facility. Mr. Broderick was out of the office on Thursday and Friday.

Weapons Engineering Tritium Facility (WETF): This week, a WETF subject matter expert identified a non-conservative error in the software spreadsheet used to complete the monthly Technical Safety Requirement (TSR) surveillance for combustible loading in the facility. As a part of calculating the average combustible loading for a series of rooms, the spreadsheet does not include combustibles from one of the required rooms. The TSR surveillance limit is not exceeded if the combustibles for that room are correctly included in the combustible loading calculation. WETF management declared a significance category 2 management concern for this issue in part because a software quality issue was identified for this same spreadsheet in December 2011 and corrective actions did not identify the additional error (see site rep weekly 12/9/11).

Both software spreadsheet errors (i.e. the one identified this week and the one in December 2011) were caused by a change that occurred in November 2011. The combustible loading spreadsheet is graded as the second highest level of safety-related software; however, verification and validation (V&V) reviews failed to identify either error. In addition, extent of condition reviews performed in December 2011 that included additional V&V of the software spreadsheet did not identify the additional error introduced in November. WETF management identified corrective actions that include a line-by-line review of combustible loading spreadsheet calculations and an evaluation of the WETF software quality assurance program. As noted on July 13th, LANL is also reviewing recent software quality assurance issues related to TSR violations across the site and is scheduled to submit an improvement plan to the site office this month.

Plutonium Facility: This week, Plutonium Facility management declared a Potential Inadequacy of the Safety Analysis (PISA) based on structural/seismic issues with shelves and racks in two vault rooms. During performance of the In-Service Inspection (ISI) for design features in the vault, the system engineer identified a number of missing and loose bolts and screws. During evaluation of these issues, the system engineer identified that the SAFER seismic analysis of four vault rooms was not consistent with the actual field configuration. Subsequent seismic evaluations identified structural issues in two rooms that represent a PISA and need to be resolved. Three locations in these two rooms will require minor structural upgrades to resolve this issue. Plutonium Facility management is also reviewing the SAFER analyses to determine why these issues were not identified during the seismic review.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 24, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 24, 2012

Chemistry and Metallurgy Research (CMR) Building: On Tuesday morning, CMR personnel identified a significant amount of liquid on the floor in the basement of Wing 5. Appropriate actions were taken to contact the operations center. CMR Industrial Hygiene and Radiation Protection personnel responded to isolate the area and evaluate the situation. Based on the size of spill, the facility incident command was established and LANL Emergency Response personnel were called to respond. CMR management also suspended all activities involving liquids in Wing 5 laboratories. Hazmat and facility personnel were able to contain the spill area and confirmed that actions to cease liquid activities stopped the source of the leak. No personnel contamination occurred during this event and spread of contamination outside of controlled areas has not been identified. Cleanup activities commenced on Tuesday and have continued throughout the week.

CMR uses acid drain lines that transfer low-level radioactive liquid waste from individual laboratory rooms to a collection system in the basement that then routes the liquid waste to the Radioactive Liquid Waste Treatment Facility in TA-50. The acid drain line system is known to have significant material condition issues that have resulted in leaks and contamination of basement areas in the past. Although investigation continues, CMR personnel believe that a backup of liquids in a portion of this system caused the leak into the basement. In 2009, facility personnel systematically wrapped and bagged all system flanges because of leak and contamination issues. In addition, CMR management planned to perform periodic surveillances on the bagged flanges. Based on discussion with CMR personnel, these periodic inspections have not been performed as was intended; however, facility management noted this week that they plan to re-evaluate the need to inspect the wrapped flanges (see site rep weekly 2/27/09).

Plutonium Facility: This week, the site office provided additional direction to LANL on the performance of seismic static non-linear analysis for the Plutonium Facility. The letter identifies that additional seismic evaluation is required to address 1) the impact if the service chase roof joints are released and 2) the effect of modal-based loading versus common direction loading currently being used. LANL is directed to perform additional sensitivity runs at the next opportunity that does not delay current efforts and to obtain LASO concurrence with any work-scope that extends into FY 2013. The laboratory is also directed to include longer-term analytical and upgrade work-scope in the Project Execution Plan associated with Recommendation 2009-2, which is scheduled to be updated in November. The Board's staff will continue to review modeling and analysis work to ensure that technically defensible seismic analysis is completed and used for safety basis evaluations and potential upgrade decisions.

Transuranic Waste Operations: This week, the contractor readiness assessment team reported the results of their review of the Drum Venting System in Area G. The team identified three pre-start items in the areas of operations, engineering and safety basis and two post-start findings for Environmental, Safety and Health. Area G personnel are developing corrective action plans for these issues. The federal readiness assessment that was to start next week has now been delayed to late-September.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 31, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending August 31, 2012

Brett Broderick completed his assignment as a site representative at LANL this week. DNFSB staff member Richard Verhaagen will report to LANL in September.

Los Alamos Neutron Science Center (LANSCE): On August 24th, LANL personnel identified beta-contamination on the skin and clothing of a worker in a LANSCE experimental area. Subsequent surveys conducted by radiological control technicians on August 25th identified significant contamination at multiple locations at the Lujan Center experimental area. Based on the extent of contamination, the LANSCE facility operations director requested assistance from LANL emergency management and the Radiological Assistance Program (RAP) was notified. At approximately 1630 on Saturday afternoon, the emergency management incident command declared an operational emergency and the Emergency Operations Center was activated.

Surveys performed by LANL and RAP team personnel identified beta-contamination, Technetium-99 (Tc-99), outside LANL property at multiple homes and automobiles and on the skin and clothing of personnel who had worked in these areas. Additional RAP team support was requested and deployed to complete survey and decontamination efforts in multiple offsite locations. LANL and RAP team monitoring of LANSCE personnel that may have been in the area of the contamination continued throughout the week. All affected personnel will perform a special bioassay.

Based on the type of contamination and all information available, LANL management has stated that the contamination does not pose health risks to workers or the public. A senior level investigation was initiated by the laboratory director this week. In addition, NNSA NA-1 directed establishment of an Accident Investigation Board (AIB) in accordance with DOE Order 225.1B that will investigate the event “identifying all relevant facts, determining direct, contributing, and root causes of the event, developing conclusions, and determining the judgments of need to prevent recurrence.” The AIB investigation will start on Tuesday and provide a final report to NA-1 by the end of September.

Plutonium Facility – Seismic Safety: On Wednesday, Plutonium Facility management declared a Potential Inadequacy of the Safety Analysis (PISA) based on static non-linear seismic analysis of the Plutonium Facility. The results indicate that the probability of failure for certain structural components do not meet the performance goals identified in the safety basis. LANL will evaluate this information using the Unreviewed Safety Question process to determine the safety basis impact and the need for additional controls.

Engineering: This week, the engineering services division identified that most concrete used at LANL since May 2011 did not meet the ASTM C33 specification requirements for coarse aggregate. Concrete placements were suspended pending resolution of this issue. Non-conformance reports have been issued for concrete used during this period. Notably, the drag strut repair at the Plutonium Facility was performed during this period and LANL is evaluating the potential impact.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 7, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 7, 2012

Los Alamos Neutron Science Center (LANSCE): On Tuesday, the NNSA Accident Investigation Board (AIB), in accordance with DOE Order 225.1B, received an in-brief from LANL personnel and began their investigation into the recent LANSCE contamination event involving Technetium-99. The investigation will continue next week and the team will provide a final report to NA-1 by the end of September.

LANL also continued recovery plan activities this week. All known areas of contamination outside of Technical Area-53 have been decontaminated. Detailed surveys are being conducted for the Lujan Center Experimental Area and other contaminated areas at LANSCE to develop and execute decontamination plans.

Plutonium Facility – Seismic Safety: This week, LANL concluded that the Potential Inadequacy of the Safety Analysis (PISA) identified last week based on the results of the static non-linear analysis did represent an Unreviewed Safety Question. LANL is preparing an Evaluation of the Safety of the Situation for submittal to the site office for this issue. The static non-linear analysis has also been communicated to the peer review team. LANL personnel will be meeting with this team later this month to discuss the results and any peer review comments.

Chemistry and Metallurgy Research (CMR) Building: CMR management declared a Technical Safety Requirement (TSR) violation this week based on an obstructed sprinkler head in the Wing 9 basement. The obstructed sprinkler head was identified in October 2011 and a non-conformance report was written for the issue; however, no operability determination was performed at that time. After the issue was recognized by the CMR engineering manager earlier this week, an immediate operability determination was performed and the sprinkler head was determined to be inoperable. Appropriate actions were taken to enter the TSR Limiting Condition of Operation for the affected area. A work order was written to remove the obstruction and CMR management exited the Limiting Condition of Operation following execution of the work.

CMR personnel conducted an extent of condition review and concluded that other non-conformance reports did not impact TSR Limiting Conditions of Operation. In addition, the LANL procedure for non-conformance reports has changed recently to drive evaluation of potential safety basis impacts that should help preclude similar issues in the future.

Transuranic Waste Operations: LANL recently submitted a safety basis change to the site office to allow an increase in the material at risk (MAR) for sort, segregate and size reduction (SSSR) activities at Area-G. The change will increase the MAR limit from 2.5 to 18 plutonium equivalent curies (PE-Ci). In addition, the safety basis change does not include plume meander in the consequence evaluation consistent with comments from the site office. Approximately 70 above-ground waste containers at Area G that cannot be remediated at the WCRR repackaging facility (e.g., fiberglass reinforced boxes and large metal containers) exceed the 2.5 PE-Ci SSSR MAR limit. The safety basis change will allow LANL to process approximately 2/3 of the 70 transuranic waste containers.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 14, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis
SUBJECT: Los Alamos Report for Week Ending September 14, 2012

Electrical Safety: In the last week, there have been three separate electrical safety issues at LANL. First, a Physical Chemistry and Applied Spectroscopy post-doctorate employee received two minor shocks from a metal mounting rod last Friday. The employee was evaluated by occupational medicine and released with no restrictions. Subsequent investigation identified a mixer located on the same mounting rod with an intermittent line voltage short that caused the issue. LANL also determined that the mixer was not listed by a Nationally Recognized Testing Laboratory or approved for use as required by LANL procedures. As part of the extent of condition review, other chemistry division electrical equipment is being reviewed to ensure they are either listed or approved per LANL procedures.

Second, during installation of an oven at Technical Area-55 last weekend, two LANL employees received a minor shock. The two employees were evaluated by occupational medicine and released with no restrictions. The electrical safety officer subsequently identified that one of the three phases from the 480 volt line connection had shorted to the oven during the installation process. Finally, a LANL worker in Technical Area-16 opened a 480 volt disconnect and verified zero energy without the required Lock-Out/Tag-Out and personnel protective equipment. No personnel were injured during this activity; however, these activities were not covered by a work package and were not consistent with LANL hazardous energy control requirements. These three events highlight the need to maintain NNSA and LANL focus on work control and electrical safety.

Weapons Engineering Tritium Facility (WETF): On Tuesday, WETF management declared a Technical Safety Requirement (TSR) violation based on the expiration of a pressure safety variance in December 2011. In January 2012, the variance in question was replaced by three separate variances that effectively resolved the issue at that time. The expiration of the variance was identified by WETF engineering as part of the extent of condition review for previously identified TSR violations due to variance expirations. The extent of condition review for these type issues is now complete at WETF.

Radioactive Liquid Waste Treatment Facility (RLWTF): In 2009, LANL completed a low level liquid waste connection to the Waste Management Risk Mitigation (WMRM) tanks to provide 250,000 gallons of emergency storage capacity. Earlier this year, LANL decided to use a portion of this storage capacity for low level liquid waste influent storage to replace ageing RLWTF tanks that do not meet regulatory requirements. Physical modifications to support this configuration are expected to be complete later this month. RLWTF management plans to conduct appropriate readiness activities and begin using the WMRM tanks later this year.

Facility Hazard Categorization: This week, the site office approved a LANL request to use NA-1 SD G 1027, *Guidance on Using Release Fraction and Modern Dosimetric Information Consistently with DOE STD 1027-92* for the Technical Area-48 RC-1 building. The approval is contingent on validated implementation of key facility controls in the hazard analysis. The site office also directed LANL to obtain site office concurrence for use of this guidance for other LANL radiological facilities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 21, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending September 21, 2012

Plutonium Facility: This week, LANL submitted the Evaluation of the Safety of the Situation (ESS) to the site office for the Unreviewed Safety Question associated with the Plutonium Facility structural performance (see site rep weekly dated 8/31/12). Recent static non-linear seismic analysis indicates that the probability of failure for certain structural components do not meet the Documented Safety Analysis (DSA) performance goals (i.e. probability of failure of 1.4×10^{-4} versus 1×10^{-4}). The ESS references DOE-STD-1020 that permits “using natural phenomena hazard exceedance probability of twice the value specified for new design” (i.e. 2×10^{-4}) for existing structures that are close to meeting the criteria. LANL recommends site office approval of continued operations at the Plutonium Facility under this ESS, and intends to update the performance goal in the DSA to 2×10^{-4} .

No operational restrictions are identified in the ESS; however, the document does acknowledge that this probability of failure applies not only to loss of confinement (the safety basis credited function) but also to potential facility collapse mechanisms. Facility collapse could result in offsite dose consequences well in excess of that postulated in the DSA. LANL plans to develop engineering designs to brace and strengthen Plutonium Facility structural elements. The designs will be prioritized based on capacity margin calculations and cost of proposed upgrades. Conceptual designs will be summarized and submitted to NNSA as part of the Recommendation 2009-2 Project Execution Plan update in early November. The site office is currently reviewing the ESS.

The seismic analysis peer review team met with LANL personnel early this week to discuss comments and questions on the recently completed analysis. Comments will be incorporated into the final report and drive follow-up evaluations, as appropriate. In addition, LANL will perform additional analysis in FY 13 to ensure the seismic results are appropriately bounding as directed by NNSA.

Software Quality Assurance (SQA): This week, LANL submitted a SQA improvement plan to the site office to address weaknesses identified through an analysis of SQA issues related to Technical Safety Requirements (TSR) violations (see site rep weekly dated 7/13/12). The analysis identified 11 instances of SQA issues causal to TSR violations that occurred from August 2006 to the present. The improvement plan identified five SQA areas of concern, including: requirements determination; configuration management; validation and verification; software interfaces; and training. Additionally, the team that conducted the analysis concluded that knowledge of software quality management policies and procedures, including roles and responsibilities, is a weakness that directly contributes to these five areas of concern. The improvement plan includes a number of action items that will be implemented at LANL nuclear facilities and will be monitored and managed by LANL’s Associate Director for Nuclear and High Hazard Operations.

Transuranic Waste Operations: The site office completed the closure verification for all pre-start issues and approved the corrective action plan for post-start issues identified in the contractor readiness assessment for the Area G drum venting system this week. Based on these activities, the site office transmitted the notice to proceed memorandum for conduct of the federal readiness assessment. The review is expected to start on Monday.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 28, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending September 28, 2012

Performance Execution Plan (PEP): On September 11, 2012, LASO and LANL jointly approved the Fiscal Year 2013 Strategic PEP for management and operation of LANL. Consistent with direction from NNSA HQ, this new PEP is radically different than previous years' plans in that it is shorter, more subjective, and contains considerably less detail and specificity. Objective performance measures have been replaced with both critical factors and applicable site specific outcomes that will be assessed in the aggregate to establish performance ratings for each objective.

The LANL strategic PEP contains five performance objectives supported by 12 site specific outcomes, some of which are identical to outcomes in other NNSA site PEPs. Some site specific outcomes unique to Los Alamos include: mature the NNSA Plutonium (Pu) Strategy and effectively implement funded FY 2013 elements; successfully execute Pu Oxide production efforts and achieve Surplus Fissile Materials program objectives; achieve program commitments negotiated under the January 2012 Framework Agreement including disposition of 1,800 m³ of Area G legacy waste; complete seismic/structural analyses, and any necessary facility upgrades, for the Plutonium facility in accordance with an NNSA list to be approved no later than the end of the first quarter; and demonstrate long-term site planning activities to enable a sustainable and viable National Laboratory. Of note, LANL must achieve a rating of "very good" or better in each performance area and experience no significant safety or security incidents during the performance period in order to earn the award term incentive.

Transuranic Waste Facility (TWF) Project: This week, NNSA conducted an Independent Project Review of the TWF Project to determine if requirements for critical decision-2, *Approve Performance Baseline*, have been met. The review focused on the following areas: technical; cost, schedule and risk; management and acquisition; environment, safety, health and quality assurance; and commissioning. The team concluded that the project has achieved 90 percent design as defined by NNSA guidance and LANL engineering standards; however, several comments and recommendations were identified that require project action prior to critical decision-2, including resolution of nuclear safety issues identified in the Board letter dated June 11, 2012. The TWF project is scheduled to submit a revised safety basis strategy and Preliminary Documented Safety Analysis to the site office for approval in early October. Currently, approval of critical decision-2 is planned for December.

Weapons Engineering Tritium Facility (WETF): In July, WETF personnel declared the Tritium Gas Handling System interlock inoperable and entered the appropriate safety basis limiting condition of operation. This interlock remains inoperable and the safety basis would have required the facility to enter cold standby for the affected area on September 30th. The site office approved a LANL request for a temporary safety basis change this week to eliminate the requirement to enter cold standby for the affected area. In August, the site office agreed that cold standby (versus warm standby) is not always the safest operational state and directed LANL to revise the safety basis to eliminate the cold standby mode. This revision is scheduled for submittal in October. WETF personnel continue facility restart activities to support resumption of programmatic work. Currently, contractor and federal readiness reviews are scheduled in December 2012 and January 2013, respectively.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 5, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending October 5, 2012

Radioactive Liquid Waste Treatment Facility – Upgrade Project (RLWTF-UP): Last week, LANL submitted a revision to the Safety Design Strategy (SDS) for the RLWTF-UP to the site office for approval. In 2011, NNSA approved a contractor proposal to separate the transuranic and low-level waste processes into individual structures. Low-level liquid waste processing will be conducted in a radiological facility (i.e., less than hazard category 3) planned for completion in 2017. Transuranic liquid waste processing will be conducted in a hazard category 3 nuclear facility planned for completion in 2020. The updated SDS reflects this separation and also incorporates previous comments from the site office. LANL is currently conducting a siting study for the transuranic facility to determine the optimum separation from the radiological facility. Critical decision-2, *Approve Performance Baseline*, is currently planned for December, 2012, for the low-level waste portion of the project.

Work Planning and Control. There have been several issues with LANL work planning and control this week. Two of the more significant failures to properly control work included:

At PF-4, construction personnel removed the automatic closing mechanism from an operable safety class confinement door while reinstalling trim. The PF-4 safety basis requires the confinement doors to be capable of closing automatically via this automatic door closure device. The trim work had not been authorized on the plan of the day and had not been released by the PF-4 operations center. Contributing to this unauthorized maintenance, the integrated work document for door modifications did not specify a sequence to complete door restoration and operability testing.

At the Chemistry and Metallurgy Research facility, electricians preparing to perform corrective maintenance on an elevator installed their lockout/tagouts (LO/TO) on the incorrect power isolation. An independent verifier (IV) identified the breaker specified on the LO/TO did not match the current location of the LO/TO. Instead of stopping work and informing management as required, the electricians removed their LO/TO to reinstall it on the specified circuit breaker. The electricians once again hung their LO/TO on an incorrect power isolation, but this time the IV did not identify the discrepancy when he reviewed the LO/TO. No work was performed on energized equipment before the discrepancy was discovered. Contributing to this issue, instructions in the integrated work document did not direct workers where to install the LO/TO, but rather relied on an attachment to communicate this important information.

Area G Drum Venting System (DVS) Federal Readiness Assessment (FRA). On Thursday, the FRA team presented their outbrief for the DVS readiness assessment. In total there were 18 pre-start findings, 14 post-start findings, and 48 observations. The FRA team concluded that the contractor had not successfully demonstrated readiness for hazard category 2/3 drum venting operations in Area G. This conclusion was based in large part on the number and severity of the findings. Many of the findings were attributed to inappropriate TSR control selection and development, and a reliance on specific administrative controls vice engineered controls. The final assessment report is expected to be issued next week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 12, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending October 12, 2012

Area G 3706 Campaign: In FY 2012, LANL removed 920 m³ of the highest risk above ground solid transuranic (TRU) waste from TA-54, Area G, under the first year of the 3706 campaign. This inventory included 23,075 PE-Ci of TRU waste and exceeded the performance goals of 800 m³ and 22,500 PE-Ci. The FY 13 performance goals are to remove a campaign cumulative volume of 2600 m³ and a campaign cumulative 33,739 PE-Ci. Achieving these goals will keep the project on pace to meet the framework agreement commitment to remove the 3706 m³ of above ground TRU waste by June 30, 2014.

In order to achieve the FY 2013 performance goals, the box lines in domes 375 and 231, and the drum venting system (DVS) in dome 33 will have to be fully operational. Fire suppression system upgrades and a federal readiness assessment (FRA) are required prior to commencing operations in dome 375. Fire suppression system upgrades, ventilation system commissioning, and a contractor readiness assessment are required prior to commencing box line operations in dome 231. Corrective actions from the DVS FRA (see 10/5/12 weekly) will have to be identified and closed prior to commencing Hazard Category 2/3 DVS operations in dome 33.

Work Planning and Control: LANL continues to experience problems with work planning and work control as noted in last week's report. For example:

At a radiochemistry laboratory, a known previously contaminated cask located outside of the building was intentionally opened with a forklift without a specific integrated work document or radiological work permit in place. The work was done in the open air outside of a controlled area because it was believed that the cask was clean based on one individual's recollection from nearly 20 years ago. The lid was replaced when the radiological control technician detected the presence of contamination inside the opened cask.

At an environmental, safety and health analytical laboratory, workers removing ducting from a furnace were exposed to ash containing perchlorate and nitric acid. The development of the work scope for this job did not identify these contaminants as a potential hazard, and as such no controls (i.e. respirator protection) for this hazard were employed.

The Associate Director for Nuclear and High Hazard Operations has recognized this trend of poor performance in planning and controlling work, and is emphasizing this as a focus area with his facility operation directors.

Criticality Safety Improvement Plan: On September 28, 2012, LANS submitted a revised, *Los Alamos National Laboratory Nuclear Criticality Safety Program Improvement Plan*, to the site office for review and approval. This is the sixth revision to the document since it was issued in March, 2006. This most recent revision updates the status of program implementation at important facilities and updates progress on planned nuclear criticality safety evaluations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 19, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending October 19, 2012

Staff members T. Chapman, J. Deplitch, M. Helfrich and J. Pasko were onsite this week to review the LANL Emergency Management Program. The staff conducted field walk-downs of emergency response capabilities and plans at the Plutonium Facility, the Chemistry and Metallurgy Research Building, Area G and the Weapons Engineering Tritium Facility.

Plutonium Facility – Seismic Safety: On Thursday, the site office directed LANL to complete an addendum to the Plutonium Facility safety basis to address the Unreviewed Safety Question (USQ) associated with the facility structural performance. The site office did not take action on the LANL submission of an Evaluation of the Safety of the Situation (ESS) for this USQ. Instead the site office requested that a safety basis addendum be developed and submitted for approval that addresses the steps identified under *Exigent Circumstances* in the DOE memorandum dated September 17, 2012, concerning *Adequate Protection*. These steps were identified by DOE for “an unusual situation ... where no viable control strategy exists to prevent or mitigate the consequences in one or more of the accident scenarios from exceeding the EG [Evaluation Guideline].” The site office also provided specific comments on the ESS to be addressed in the safety basis addendum and requested completion of this action concurrent with submittal of the seismic project execution plan (due November 7th) provided there was no schedule impact and no later than November 14th regardless.

Plutonium Facility – Criticality Safety: This week, Plutonium Facility management declared a Potential Inadequacy in the Safety Analysis (PISA) based on criticality safety concerns for vault rooms B and I. These rooms had been operating under a Justification for Continued Operations (JCO) since 2007 because criticality safety evaluations included a neutron poison (boron) with inadequate documentation that the boron was present. Without the poison, criticality safety controls were not adequate to prevent criticality under all normal and credible abnormal conditions. In September, LANL completed a new criticality safety evaluation that did not include the boron and exited the JCO; however, a separate calculation for the interaction between floor and drawer locations was identified this week that assumes the presence of boron. Plutonium Facility management suspended operations and entered mode 2 for these vault rooms pending resolution of the PISA. Identification of this issue was prompted by questions from site office personnel.

Weapons Engineering Tritium Facility (WETF): WETF management declared a Technical Safety Requirement (TSR) violation based on the failure to meet overpressure protection requirements for the Tritium Waste Treatment System (TWTS), Tritium Gas Handling System (TGHS), and the Hot Inlet System (HIS). The failure to meet the TSR requirements stemmed from inadequate historical calculations of over-temperature setpoints for these systems that did not include uncertainty calculations in their determination. TWTS over-temperature setpoints were found not to comply with the ASME Boiler and Pressure Vessel Code as required by the TSRs for overpressure protection. TGHS and HIS over temperature setpoint calculations could not be shown to comply with institutional engineering standards applicable at the time these calculations were made. Updated setpoint determinations that included uncertainty calculations revealed that the original setpoints were not protective of a credited operating parameter contained in the deflagration limit calculation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 26, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending October 26, 2012

Los Alamos Neutron Science Center (LANSCE): In August, LANL identified a release of contamination at the Lujan Center experimental area at LANSCE and the subsequent spread of contamination to multiple offsite locations (see 8/31/12 report). LANL and other response teams aggressively responded to the spread of contamination, retrieved contaminated items and performed decontamination as required. Although the contamination levels found offsite exceeded DOE's release criteria, NNSA and LANL management have stated that contamination did not pose health risks to the workers or public. Based on the significance of this event, NA-1 directed establishment of an Accident Investigation Board (AIB) in accordance with DOE Order 225.1B. The AIB completed their investigation in September and NA-1 recently released the report.

The AIB concluded that LANSCE personnel lost positive control of a Technetium (Tc-99) sample from January 2012 until the time of the event. The investigation indicates that the Tc-99 sample container was re-used in August 2012 (likely on August 20th), which caused the initial spread of contamination. The AIB report notes that the accident "was (and its recurrence is) completely preventable." The team identified 14 Judgments Of Need (JONs) including the following: 1) establish effective engineering and administrative controls to ensure radioactive samples are identified and controlled; 2) establish clear roles and responsibilities for controlling samples and participating in experiments; 3) establish formal processes for managing material in radiological storage cabinets; 4) ensure personnel understand and comply with management processes; 5) revise work control process to ensure that work remains consistent with the reviewed and approved scope; and 6) address inadequacies in both site office and LANL oversight activities.

LANL plans to implement phased corrective actions with the first phase focused on the Lujan Center and the second phase to include other LANSCE facility areas. For the first phase (Nov 2012 to Feb 2013), LANL will implement interim corrective actions that address the JONs identified by the AIB for a portion of the Lujan Center flight paths (experimental flight paths in the area of most significant contamination will remain shut down). The scope and implementation of these corrective actions will be assessed by an independent laboratory committee. The second phase will include permanent corrective actions at LANSCE for the 2013 run cycle (July 2013).

Area G Drum Venting System (DVS): The site office transmitted the final report for the federal readiness assessment (FRA) of Area G, Dome 33 DVS operations (see 10/5/12 weekly). The review team concluded that the project had not demonstrated readiness to commence Hazard Category 2/3 operations based on the volume and severity of the findings. The site office has requested a corrective action plan be submitted by November 1, 2012, and a report on the immediate actions taken and the performance improvement approaches selected to close the prestart findings by November 19, 2012. In response to the report, Area G management has entered the New Information process to evaluate whether: the Technical Safety Requirements (TSR) protect the drum venting material at risk limits; the DVS chamber can be credited as a blast-mitigation device; the Unreviewed Safety Question process has been effective in ensuring TSR controls are properly implemented; and certain specific administrative controls apply to unvented drums that are overpacked. Following the completion of the corrective action plan, LASO plans on conducting a limited scope FRA to evaluate closure of the prestart findings.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 2, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director

FROM: R.T. Davis and R.K. Verhaagen

SUBJECT: Los Alamos Report for Week Ending November 2, 2012

The site representatives were out of the office. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 9, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending November 9, 2012

Board member S. Sullivan and Board staff member R. Tontodonato visited the Los Alamos National Laboratory to discuss current operations and to walkdown select defense nuclear facilities.

Weapons Engineering Tritium Facility (WETF) – Disciplined Operations: WETF continues to experience issues with formality of operations as restart preparations move forward. Over the past few weeks a number of engineering and safety basis issues have been discovered by both facility personnel and the NNSA Facility Representative (FR) assigned to oversee WETF operations, including:

- Facility engineering personnel discovered two new pressure safety Technical Safety Requirement (TSR) noncompliances.
- A TSR violation was declared when the FR identified approximately 20 WETF procedures that had been approved and issued without having been evaluated through the Unreviewed Safety Question process against the currently implemented Documented Safety Analysis.
- The FR identified that a Limiting Condition for Operation action statement had not been entered within the required timeframe.

This week, in response to this continuing trend of poor formality of operations, the site office communicated concerns with disciplined operations at WETF to LANL management. The site office noted that disciplined facility operations continue to be undermined with configuration management, pressure safety, safety basis implementation and operational readiness issues. The correspondence included an outline of significant events that have occurred over the past two years. Although the site office commended WETF operations for being transparent in their identification and reporting of these issues, they noted that the number and repetitive nature of the events indicate that extent of condition reviews and corrective actions have been less than adequate.

In an effort to improve disciplined operations at WETF, the site office directed LANL to provide a briefing that outlines the continued programmatic need for WETF operations, additional resources needed to successfully resume facility operations, and steps needed to bring WETF into compliance with its safety basis. The corrective action plan is expected to establish commitments that will ensure appropriate resources are applied to resolve technical issues, achieve readiness, and enable safe and sustainable operations in a timely, effective, and efficient manner.

Plutonium Facility – Safety Basis: LANL submitted three Evaluations of the Safety of the Situation to the site office for approval to address recent Potential Inadequacies of the Safety Analysis associated with the following: 1) non-conservative leak path factor associated with the seismic/fire accident scenario; 2) post-seismic fire in the basement; and 3) vault room shelving seismic requirements. The first two issues were identified by the Board's staff during a review of the Documented Safety Analysis earlier this year and communicated to NNSA by Board letter on June 18, 2012. For the leak path factor issue, an immediate action remains in effect to limit the material at risk for heat source plutonium in two rooms close to the exit doors. LANL is also implementing upgrades to the vault room shelving in question (planned for this month) to meet performance category 3 seismic requirements. LANL concluded that the post-seismic fire in the basement does not represent an Unreviewed Safety Question.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 16, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending November 16, 2012

Area G Drum Venting System (DVS): On Tuesday morning, DVS personnel discovered burned radioactive waste tags on a transuranic waste drum in the DVS area caused by failure of a heater. The heater element failed and hot metal dropped onto the waste drum and tags, which caused the tags to smolder. Subsequent investigation by Area G management identified that manufacturer recommendations on exclusion of combustible materials below these heaters were not being followed. DVS personnel have removed combustibles from beneath the heaters and a standing order has been issued to require a combustible standoff distance. Area G personnel noted that approximately half of the ten heaters of this type used in Dome 33 (the DVS dome) fail on an annual basis. LANL plans to replace the current heaters with a safer design identified by engineering personnel. Area G personnel are completing extent of condition reviews, a lessons learned and other corrective actions for this event.

Plutonium Facility – Seismic Safety: This week, the site office forwarded an update to the TA-55 Project Execution Strategy to NNSA-HQ that addresses seismic upgrades at the Plutonium Facility in response to Board Recommendation 2009-2. This revision includes plans for seismic upgrades of eight basement captured columns in Fiscal Year (FY) 13 and roof girders in FY 14. These upgrades address issues identified in the initial static non-linear seismic analysis that resulted in the declaration of a Potential Inadequacy of the Safety Analysis in August (see 8/31/12 site rep report). For FY 13, the plan also includes developing the critical decision 1 package for the Safety Class, Performance Category-3 active confinement ventilation system and continuing seismic upgrades for the fire suppression system (planned for completion in FY 14). LANL continues additional analysis and testing to ensure the seismic results are adequately bounding as directed by NNSA.

Criticality Safety: LANL recently provided the site office with a corrective action plan to strengthen and improve the criticality safety program and to respond to findings identified by a recent NNSA Criticality Safety Support Group (CSSG) assessment. The plan includes specific actions to address the following two findings in the CSSG report: 1) ownership and monitoring of the nuclear criticality safety program is less than adequate; and 2) inability to close outstanding criticality issues in a timely manner. Actions include hiring a new criticality safety group leader, appointing the Principal Associate Director for Operations and Business (Beard) as the chairman of the nuclear criticality safety committee, strengthening line management ownership and responsibilities, establishing facility-specific and programmatic metrics, establishing responsibilities and expectations to track and close issues in a timely manner, and re-validating criticality safety work priorities.

The CSSG team also identified an opportunity for improvement associated with the loss of LANL nuclear criticality staff. Based on further attrition in this group since the CSSG review, corrective actions to address staffing issues were included in the corrective action plan. In addition, LANL identified the following near-term compensatory measures: 1) establish and communicate the highest priority for limited criticality safety resources (support floor operations); 2) identify resources outside the criticality safety group within LANL that could respond to upset conditions and issues; 3) accelerate training and qualification of contractor staff; and 4) provide an option for an extended work week for criticality safety staff.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 23, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending November 23, 2012

Plutonium Facility – Seismic Safety: LANL recently submitted a safety basis addendum to the site office that addresses the Unreviewed Safety Question associated with facility structural performance (see 10/19/12 weekly). Static non-linear seismic analysis performed by LANL earlier this year indicates that the probability of failure for multiple structural components exceeds the performance goal identified in the safety basis. The safety basis addendum identifies a worst case offsite consequence of approximately 900 rem for a seismic collapse scenario that includes spill, impact and fire release mechanisms. The addendum does not identify new controls or compensatory measures that mitigate the potential consequences for this accident scenario.

LANL has developed conceptual design upgrades for two vulnerable structural components, the basement captured columns and facility roof girders. The addendum indicates that upgrades for these components will be complete in FY 13 and FY 14, respectively. The LANL submittal provides responses to the steps identified under Exigent Circumstances in the DOE memorandum dated September 17, 2012 on Adequate Protection. Consistent with the DOE memorandum, NNSA will “specify a senior level of DOE approval authority for these circumstances, including a Program Secretarial Officer or higher (when appropriate) in consultation with its Central Technical Authority and the Office of Health, Safety and Security.”

Weapons Engineering Tritium Facility (WETF): WETF engineers continue to identify pressure safety issues as a result of extent of condition reviews. Most recently, the following four noncompliances with pressure safety Technical Safety Requirements (TSRs) were identified: 1) compensatory measures for some pressure safety variances do not meet requirements; 2) some system components do not have adequately sized pressure relief devices installed; 3) some system components do not have any pressure relief device installed; and 4) preventative maintenance for some system pressure relief devices is not performed. Facility engineers noted during the critique that extent of condition reviews were almost complete and that all WETF systems will have been fully evaluated to ensure they meet pressure safety requirements in the very near future.

Area G Drum Venting System (DVS): LANL submitted, and the site office approved a Corrective Action Plan supporting the Federal Readiness Assessment (FRA) of DVS operations at Area G (see 10/26/12 weekly). In response, the site office developed and approved a plan of action for a limited scope FRA to evaluate closure of the initial prestart findings. This limited scope FRA will evaluate a select number of core functions based on performance during the original FRA and is scheduled to commence on December 10, 2012.

Certification Requirements Assessment: Earlier this month the Technical Area 55 (TA-55) Facility Operations Director declared a TSR noncompliance based on the failure of control room operators to meet all requirements for their two year re-qualification. In response, the site office has informed LANL that they will be conducting an assessment of certification requirements for operators and supervisors at TA-55. The assessment is scheduled to commence on December 3, 2012, with the overall objective of ensuring the respective Nuclear Facility Training Programs are effectively implemented.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 30, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending November 30, 2012

Kevin Smith recently announced that he will be leaving LANL as the site office manager to become the new manager of the Office of River Protection at the Hanford site. Juan Griego will be acting in his place until a new site office manager is assigned.

Transuranic Waste Operations – Safety Basis: In March 2012, the site office manager approved a major revision to the safety basis for transuranic waste operations at Technical Area-54, the Area G Basis for Interim Operation (BIO). This document will replace the current safety basis that was originally approved in 2003. Following approval, LANL moved forward with implementation plans for the new document; however, there have been significant delays and Area G management now estimates that implementation will not be complete until the second half of Fiscal Year 2013. In the interim, LANL is developing a safety basis strategy (expected in January 2013) that details plans to revise the Area G BIO to improve and simplify this new safety basis. These changes, which will be reviewed and approved by the site office, are expected to help simplify implementation at Area G.

The site office also provided direction to LANL this week to address and respond to the Board letter dated November 19, 2012, that identifies inconsistencies in the Area G BIO. LANL is requested to evaluate the issues identified and enter the Potential Inadequacy of the Safety Analysis process where appropriate and to provide a response on all issues to the site office by December 21st.

Activity-level Work Planning Oversight: This week, the site office Assistant Manager for Field Operations issued direction to all Field Operations personnel regarding their responsibilities for oversight of activity-level work planning. This direction cited DNFSB/TECH-37 and the Accident Investigation Board's report for the contamination event at the Los Alamos Neutron Science Center as examples of the importance of proper and diligent oversight of work at the activity level. The direction requires that all Facility Representative Team personnel complete at least one monthly operational awareness assessment of facility work at the experimental or activity level. These assessments are to be aimed at all aspects of planning and executing the activity being observed, including: work document development and review; coordination of work scheduling; pre-job briefings; work release; performance of work; work package closeout; and post-job brief. This direction also requires all Safety Engineering Team personnel to consider and incorporate this strategy into their formal assessments and operational awareness activities as appropriate.

Weapons Engineering Tritium Facility (WETF): In response to a series of formality of operations issues and recent site office direction to make improvements in this area (see 11/9/12 weekly), the WETF Facility Operations Director (FOD) determined that corrective actions have not been effective at ensuring the desired level of reliable nuclear operations. Based on this determination, the FOD declared the lack of effective corrective actions to be a recurring event and issued an Occurrence Report identifying this fact. Senior LANL management have indicated that the root causes associated with these recurring issues and adequate resources to address them need to be identified and in place prior to completing startup preparations. WETF management is developing a plan for how corrective actions and startup preparations will be integrated.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 7, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending December 7, 2012

Criticality Safety: As a part of LANL compensatory measures to help mitigate the risks associated with the reduction of qualified criticality safety staff (see 11/16/12 weekly), the Associate Director for Nuclear and High Hazard Operations recently communicated guidance and criticality safety priorities to LANL Responsible Associate Directors. The priorities for criticality safety resources are (in order of importance): 1) emergency response; 2) event response (infractions); 3) field support (requests for clarification from floor personnel); 4) procedure reviews; 5) annual process walk-downs; and 6) requests for new criticality safety evaluations. Facility operation supervisors and criticality safety officers are directed to emphasize with operators the need to follow criticality safety limit approvals and that if questions arise, response from criticality safety personnel will be a high priority.

Plutonium Facility – Criticality Safety: Two criticality safety related issues were identified at the Plutonium Facility this week. On Monday, workers identified liquid in a glovebox used to stage plutonium metal and oxide. Appropriate immediate actions to back-off and contact the operations center were taken. Operations personnel with criticality safety staff input developed a path forward to remove the materials from the glovebox and address the liquid. Subsequent investigation indicates that the liquid came from a legacy liquid cooling system associated with a furnace. The furnace and cooling system have not been used in over a decade; however, the system was not removed or placed out-of-service such that a limited amount of liquid remained in the system. Other similar legacy furnaces are being evaluated as a part of the extent of condition review for this issue.

Also this week, Plutonium Facility personnel identified approximately 450 grams of plutonium oxide holdup that was released into two gloveboxes during replacement of glovebox HEPA filters. These HEPA filters are used as housekeeping filters (i.e. not credited as a safety component) in the glovebox ventilation system. The filters are replaced as needed but the replacement periodicity varies depending on the operation in the glovebox and is not rigorously controlled. For the gloveboxes in question, there is a significant amount of plutonium oxide processing that has been performed for several years, however, the informal installation dates identified for one of the filters was 1991. Currently, the criticality safety evaluation for operations in these gloveboxes excludes evaluation of the filter because only limited contamination is expected. As part of the corrective actions, criticality safety will determine if additional evaluation is required. Plutonium Facility management is also pursuing an extent of condition review for other housekeeping filters, re-evaluating the program for filter replacement, and will determine if periodic non-destructive assay is appropriate for these type filters.

Plutonium Facility - Certification Requirements Assessment: The site office presented to LANL the preliminary results of the assessment of certification requirements for operators and supervisors (see 11/23/12 weekly). The assessment team concluded that the Plutonium Facility “does not have a compliant certification program for Operations Center Operators and Supervisors in accordance with DOE Order 426.2, *Personal Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities.*” This conclusion was based on a number of failures of the certification program to meet the requirements of the order. In response to these assessment results, facility management declared a Technical Safety Requirement violation for failure to ensure adequate manning by certified personnel and suspended operations in the Plutonium Facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 14, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending December 14, 2012

Weapons Engineering Tritium Facility (WETF): Since the discovery of oxygen in-leakage into the WETF hot-inlet system (HIS) in October, 2010, WETF has operated under a Justification for Continued Operation (JCO). Because the source of in-leakage has been difficult to identify and repair, the JCO has been repeatedly extended, with the most recent extension expiring on December 1, 2012. In lieu of extending the JCO, LANL submitted to the site office an Evaluation of the Safety of the Situation (ESS) declaring the HIS inoperable and concluding that with this action WETF is in a safe configuration. The ESS requires that the operational restrictions on the HIS not be removed until the in-leakage is repaired and the HIS is adequately implemented as safety significant.

In response, the site office concurred that because the HIS contains only trace quantities of tritium, the system is safe provided it is completely locked and tagged out. As such, the site office directed LANL to immediately lockout and tagout the tritium sources to the HIS. The site office noted that allowing the JCO to expire without correcting the problems in a timely manner was another example of less than disciplined operations at WETF (see 11/9/12 weekly). Additionally, the site office directed LANL to address the HIS issues and perform a contractor readiness assessment prior to making appropriate recommendations on future operations to the site office manager for approval.

Plutonium Facility – Criticality Safety: LANL submitted an ESS to the site office for approval that addresses a criticality safety issue for storage of fissile materials in vault rooms B and I. Based on questions from site office personnel in October, LANL identified that the Criticality Safety Evaluations (CSEs) for these two rooms did not adequately address the potential for interaction effects between drawer and floor storage locations (see 10/19/12 weekly). Plutonium Facility management suspended operations in vault rooms B and I. These restrictions remain in place. The criticality safety issue was subsequently declared an Unreviewed Safety Question.

The ESS recommends establishing a Technical Safety Requirement (TSR) level control for the minimum spacing between drawer and floor locations. LANL is also pursuing a new CSE for these vault rooms that will appropriately analyze interaction effects. In the interim, LANL recommends approval of the ESS that will allow resumption of vault room B and I operations with the spacing control implemented as a TSR level control. The site office is reviewing the ESS.

Transuranic Waste Facility (TWF) Project: The site office recently provided direction to LANL on the Safety Design Strategy (SDS) and the Preliminary Documented Safety Analysis (PDSA). LANL is requested to re-submit the SDS and PDSA documents in early-2013 to address site office issues including the following: 1) clear description and justification of differences between the Area G and TWF safety basis; 2) re-evaluation of material at risk limits (the site office believes the waste storage building material limits could be reduced by a factor of 2 or 3); 3) include a safety class engineered control that prevents large vehicle impact; and 4) evaluation of safety implications and life-cycle impacts of elevating waste storage containers, fire suppression system and lightning protection system (including support systems) to safety class. The TWF project design is approximately 90% complete.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 21, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending December 21, 2012

Area G Drum Venting System (DVS): A limited scope Federal Readiness Assessment (FRA) for DVS operations was completed this week. The scope of the FRA was to verify closure of core requirements and pre-start findings from a previous FRA that concluded the contractor had not successfully demonstrated readiness for Hazard Category 2/3 drum venting operations in Area G (see 10/5/12 weekly). The limited scope assessment team recommended that upon adequate closure of their one pre-start finding and site office approval of corrective actions for the three post-start findings, the startup of Hazard Category 2/3 drum venting operations be authorized in Area G. The one pre-start finding identified that facility operators, waste operators, and shift operations supervisors were not qualified in compliance with DOE Order 426.2.

The heaters in Dome 33 with a high failure rate and a failure mechanism that includes dropping hot metal from the failed heating elements have yet to be replaced (see 11/16/12 weekly). One compensatory measure in place includes marking exclusion zones beneath the heaters to prevent personnel injury and to prevent another fire in the dome. During the walkdown of Dome 33 in preparation for the DVS FRA, it was observed that there were combustible materials beneath grating and around tanks within multiple exclusion zones. The contractor has committed to clean out the combustible materials and aggressively pursue replacement of the current heaters with a safer design.

Plutonium Facility – Control Room Operator and Supervisor Certifications: On December 10th, 2012, the site office approved a LANL request for a six month extension of certification of Technical Area (TA)-55 operations center operators and supervisors following the discovery that the certification program was not compliant with DOE Order 426.2 (see 12/7/12 weekly). The LANL request identified compensatory measures that include the development of a TA-55 Operations Center Certification/Qualification improvement process. A condition of approval identified by the site office included requesting the Principal Associate Director of Operations and Business to examine the causes and perform an extent of condition review of the non-compliances. LANL is currently performing a preliminary evaluation of all certified positions to identify potential similar issues. A plan for additional extent of condition reviews that could potentially extend to qualification programs at other LANL facilities, such as Area G DVS operations, is being developed.

Chemistry and Metallurgy Research (CMR) Building – Confinement Vessel Disposition Project: Laboratory personnel continue startup preparations in CMR Wing 9 to support retrieval and disposition of radiological material contained in nine large metal confinement vessels currently stored at TA-55. LANL recently completed a detailed evaluation of startup preparations and status (similar to the red team reviews performed at Area G). This review identified concerns with the amount of floor practice time for facility workers, procedures (including the Integrated Work Document), and the technical baseline (e.g. incorrect quality assurance levels for some credited safety components). CMR personnel are working on corrective actions to resolve these issues. Earlier this month, LANL conducted an Implementation Verification Review for the safety basis associated with the confinement vessel disposition project. Readiness activities and preparation will continue in 2013 with the contractor and federal operational readiness reviews scheduled for March and June, respectively.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 28, 2012

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending December 28, 2012

The Los Alamos National Laboratory was on winter break this week. The site reps were out of the office. This report is filed for continuity purposes.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 4, 2013

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending January 4, 2013

Plutonium Facility – Seismic Safety: The site office recently provided comments to LANL on the safety basis addendum associated with inadequate structural performance identified in October 2012 (see 11/23/12 weekly). The safety basis review team that is evaluating the addendum includes subject matter experts from LASO, the NNSA Albuquerque Complex, and DOE-Headquarters. The review team provided 20 comments on the addendum that require correction or resolution. The site office memo directs LANL to resubmit the addendum along with a completed comment resolution document by January 18, 2013.

Area G – Safety Basis: LANL has submitted a revised safety basis strategy for Technical Area-54, Area G Basis for Interim Operations (BIO) and Technical Safety Requirements (TSR) to the site office for review and approval. In March 2012, the site office approved a BIO and associated TSRs to replace the current safety basis that was approved in 2003. However, due to a focus of resources on accelerating material at risk (MAR) reduction efforts through the 3706 Campaign, BIO implementation has been delayed to the second half of 2013. This new safety basis strategy proposes to revise the currently approved BIO and associated TSRs to account for the significant reduction in above-ground material at risk as a result of 3706 Campaign waste removal efforts. In addition, the revised BIO and TSRs will address issues identified in the Board letter dated November 19, 2012, that identified deficiencies in the BIO. LANL recently submitted its response to the Board's letter to the site office for review.

LANL expects to submit the revised BIO and TSRs to the site office for approval in April, 2013. This submittal date will facilitate implementation of the BIO and TSRs by September 30, 2013. In order to reduce risk while operations continue as the implementation of the BIO is delayed, LANL is proposing several actions including: relocating MAR to locations more distant from the site boundary; removing several high MAR containers in addition to those of the 3706 Campaign; and paving roads within Area G to eliminate the need for the large gasoline powered water truck currently used for dust suppression.

Los Alamos Neutron Science Center (LANSCE): In December, LANL completed initial corrective actions to support resumption of operations in the Lujan Center, ER-2 flight paths. The Lujan Center flight paths in ER-1 and ER-2 have been shut down since a release of contamination occurred in August 2012. In September 2012, NNSA's Accident Investigation Board (AIB) identified 14 Judgments of Need (see 11/2/12 weekly). The initial corrective actions to support restart of operations in ER-2 address issues identified by the AIB. Operations in ER-1 (the location of the most significant contamination) are not expected to restart until the next beam cycle (July 2013).

The site office has also increased their operational awareness of LANSCE activities during the decontamination and recovery phase including a walk-down of the sample management procedures and processes by the Assistant Manager for Field Operations. ER-2 flight path operations are expected to restart this month and continue through the end of this beam cycle (February 2013). LANL plans to implement additional permanent corrective actions at the Lujan Center and other LANSCE facilities prior to the start of the next beam cycle.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 11, 2013

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending January 11, 2013

Weapons Engineering Tritium Facility (WETF): In November 2012, LANL submitted an Evaluation of the Safety of the Situation (ESS) to address hot inlet system (HIS) oxygen in-leakage issues (see 12/14/12 weekly). At that time, LANL declared the HIS inoperable. The ESS identifies operational restrictions to ensure tritium is not introduced into the HIS and concludes that the system is in a safe configuration for air in-leakage. In December, the site office concurred that the HIS is safe, provided the system is completely locked and tagged out per LANL requirements, and directed such actions. LASO also directed conduct of a contractor readiness assessment and that the HIS remain locked and tagged until approved by the site office manager.

In December, WETF personnel completed the actions and implemented the controls identified in the ESS and directed by the site office. However, based on questions from the facility representative this week, LANL identified that an Implementation Verification Review was not conducted as required by site procedures to ensure controls were appropriately implemented. Additionally, because the ESS controls were not specifically approved by the site office, questions concerning the status of its controls are also being evaluated.

Area G – Safety Basis: The site office responded to the safety basis strategy submitted by LANL for the Technical Area-54, Area G Basis for Interim Operations (BIO) (see 1/4/13 weekly). The site office response generally agreed with the approach proposed by LANL, but cautioned that the proposed scope of and schedule for the revision was aggressive and could jeopardize timely implementation of the revised BIO. The site office directed LANL to revise the scope of the revision to ensure implementation by September 30, 2013. The site office also directed that when limiting the scope, certain revisions must be made, to include: addressing issues identified in the Board's letter dated November 19, 2012; addressing issues identified in the site office's review of the currently approved BIO; and ensuring deposition velocity is reasonably conservative as directed in a previous site office memorandum to LANL.

Plutonium Facility – Emergency Preparedness: In response to direction from NNSA headquarters, the site office has accelerated plans for a table top emergency exercise for a Plutonium Facility collapse scenario in response to a significant seismic event. An extensive series of table top exercises is planned for February 26, 2013. The site office and LANL are working closely together to select challenging scenarios to ensure preparedness of both site personnel and several outside agencies likely to respond to such an event.

Cognizant System Engineer (CSE) Program: This week, LANL submitted its response and corrective actions to the site office's Fiscal Year 2012 assessment of the CSE program. The assessment found that progress continues to be made in achieving a mature and effective CSE program at LANL. The assessment also identified two findings: 1) CSE required training curricula does not meet all requirements of DOE Order 420.1B; and 2) tracking of corrective actions in response to site office assessments of the CSE program is not fully effective. Corrective actions are being maintained and tracked through the LANL Performance Feedback and Improvement Tracking System.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 18, 2013

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending January 18, 2013

Area G – Work Planning and Control: A Radiological Controls Technician (RCT) assigned to source check an area radiation monitor in the High Energy – Real Time Radiography facility in Area G opened a vial containing a liquid Europium-152 (Eu-152) source and emptied its contents on to an equipment cabinet. The RCT mistakenly thought the vial contained a sealed source. The source was actually comprised of 0.53 mCi of Eu-152 suspended in a hydrochloric acid solution. Approximately 1 milliliter of liquid was poured out of the vial contaminating the RCT and a local area in the facility. Actions taken after the spill of material prevented contamination from being spread outside the facility.

In addition to the fact that the RCT did not know that the source being used was in a liquid form, there were a number of work planning and control issues that contributed to this event. Some of the identified issues included: no procedure existed for performing the source check activity; no pre-job brief specific to the activity of conducting the source check was conducted; word of mouth was used to identify the required source for the check; the RCT did not stop when he initially could not get the correct reading on the radiation monitor; and not all of the controls specified in the radiological work permit were followed. Additionally, issues that paralleled the release of contamination event at the Los Alamos Neutron Science Center (LANSCE) in August 2012 were identified. As a result, the Associate Director of Nuclear and High Hazard Operations has directed an additional investigation be performed by managers involved in the investigation of the LANSCE event.

Plutonium Facility – Criticality Safety: Based on questions from site office personnel, a criticality safety infraction was identified in the Plutonium Facility when workers placed containers on a cart that were too small to be restrained by an interference plate. This plate is designed to ensure containers remain in their location during a seismic event as required by the criticality safety limit approval (CSLA). During the critique of the event it was determined that controls that were identified as safety significant in the CSLA were not elevated to the safety basis documents as would have been appropriate. In response to this discovery, the New Information process has been entered and use of the carts has been suspended until appropriate criticality safety controls are implemented.

Safety Basis: The site office granted LANL extensions on the following three significant safety related documents this week to “ensure the necessary quality deliverables and management review”: 1) the PF-4 safety basis addendum to address structural performance (now due February 1st); 2) the final report on the PF-4 service chase joint mock-up testing (now due February 15th); and 3) the Area G safety basis changes to support higher material at risk box line operations (now due January 31st). The site office letter requests LANL to ensure that results from the PF-4 service chase joint testing are appropriately factored into the ongoing alternate seismic analysis.

The site office also recently provided extensive comments to LANL on the August 2012 submittal of the RANT shipping facility Documented Safety Analysis update. The site office identified 66 comments that require correction or resolution and requested LANL to resubmit the safety basis documents in 90 days.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 25, 2013

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending January 25, 2013

Federal Oversight: Earlier this month, the DOE Office of Health, Safety and Security's (HSS) Office of Enforcement and Oversight released a report on LANL's corrective action effectiveness. The HSS review team in conjunction with a site office assessment team evaluated LANL's corrective actions to address safety system oversight and other assessment findings. The HSS report agreed with the site office conclusion that the LANL process did not ensure effective implementation of corrective actions. The report also notes that previous HSS issues had not been adequately resolved. The HSS forwarding memo states that the "weaknesses call into question the current state of key aspects of the contractor's assurance system...."

Transuranic Waste Operations: LANL recently removed their sole supplier for transuranic waste drums from the approved vendors list based on failure to meet all applicable sections of the nuclear quality assurance standard NQA-1. In October 2012, a Joint Supplier Evaluation Program audit of the vendor was completed and findings were communicated that included failure to meet sections 200 through 900 of NQA-1. The vendor response in November indicated that action would not be taken on implementation of these sections, which resulted in the supplier being removed from the approved vendor list earlier this month. LANL has not noted any significant receipt inspection or performance problems with drums received from this vendor.

This week, LANL entered the site's new information process to evaluate potential safety basis impacts for nuclear facilities that use transuranic waste drums. A recently received inventory of drums is being held until a commercial grade dedication process can be developed and applied to verify that the drums meet applicable safety basis performance requirements. LANL is also evaluating options including continued use of the commercial grade dedication process as an avenue to procure drums from this sole source vendor.

Area G High Energy – Real Time Radiography (HE-RTR): This week, LANL performed decontamination activities at the HE-RTR facility to address the release of Europium-152 from a source that occurred last week (see 1/18/13 weekly). On Thursday, the decontamination was sufficient to release the facility to operations. Area G personnel also located a solid source (versus the liquid source that was released last week) to test the area radiation monitors. LANL is developing a lessons learned document to capture the work planning and control issues associated with this event. In addition, a senior team from the Associate Director of Nuclear and Hazard Operations continues to investigate this event and the corrective actions.

Transuranic Waste Facility (TWF) Project: Based on direction from the site office, LANL is performing engineering studies to evaluate the safety basis strategy for the TWF Project Fire Suppression System, Lightning Protection System and metal containers. The Preliminary Documented Safety Analysis will be revised based on the engineering studies and comments from the site office (currently scheduled to be submitted in March). Last week, LANL submitted a revised aircraft crash frequency analysis based on feedback from the site office. The project had previously been scheduled for Critical Decision-2 evaluation by the Energy Systems Acquisition Advisory Board in December 2012 but this decision has been delayed by NNSA-Headquarters.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 1, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending February 1, 2013

Plutonium Facility – Seismic Safety: This week, LANL submitted a revision to the Plutonium Facility safety basis addendum on the exceedance of seismic performance goals to the field office for review and approval. The revision was submitted to address comments in a memo from the field office on the initial submission of the addendum in November 2012 (see 1/4/13 weekly). The analysis in the addendum identifies a bounding offsite dose consequence of approximately 940 rem for the seismic accident followed by a structural collapse and fire.

In addition to committing to perform structural modifications to reduce the probability of structural collapse by the end of the 2014 calendar year, the addendum identifies four compensatory measures that will be taken while the exigent circumstances identified in the addendum are addressed. These compensatory measures include: reducing the material at risk limit for the laboratory floor; reducing the material at risk limit for the vault; crediting newly-analyzed heat source safety-class containers; and removing one kilogram of heat source plutonium from the first floor by the end of calendar year 2013. The addendum identifies that implementation of these compensatory measures will reduce offsite dose consequences approximately 30% to 60% depending on safety basis assumptions. A NNSA safety basis review team is evaluating the addendum.

Plutonium Facility – Safety Basis: The field office responded to a request by LANL to revise the Documented Safety Analysis and Technical Safety Requirements to address issues with the certification and manning of control room operators and supervisors (see 12/21/12 weekly). In particular, the revision proposed reducing manning requirements and eliminating the requirement for supervisors and operators to be certified. Due to the significance of the activities these personnel are required to perform in order to ensure safety of the facility, the field office did not approve the requested revision. Plutonium Facility operations center operators and supervisors received a 6 month certification extension approved by the field office in December 2012 while LANL upgrades the training and certification process to meet DOE Order 426.2 requirements.

Area G – Startup Activities: There are a number of startup activities ongoing and upcoming in Technical Area-54, Area G. These activities will directly support LANL's efforts to meet commitments of the 3706 campaign to disposition above ground solid transuranic waste. This week, the contractor commenced a checklist readiness assessment of the Dome 231 box repackaging line to allow Hazard Category 3 operations. This review is scheduled to be complete next week.

For the Dome 375 box repackaging line, the fire suppression system passed required hydrostatic testing this week. Following successful completion of ventilation and fire suppression system installation and testing, the facility will move into a series of startup reviews culminating in a federal readiness assessment to support up to and including Hazard Category 2 repackaging operations.

Finally, the contractor submitted a corrective action plan for the federal readiness assessment of drum venting system operations in Dome 33. Following field office approval of the corrective action plan, completion of the necessary pre-start corrective actions, and authorization by the field office to commence operations, Hazard Category 2 drum venting activities will commence.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 8, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending February 8, 2013

Plutonium Facility – Criticality Safety: This week, Plutonium Facility management declared a Potential Inadequacy of the Safety Analysis (PISA) based on failure to capture criticality safety controls associated with facility transfer carts in the safety basis. LANL had previously declared a criticality safety infraction when containers that were too small to be restrained by an interference plate were identified on these carts, which defeated the control in the criticality safety limit approval (see 1/18/13 weekly). During investigation of the infraction, LANL noted that the criticality safety documents specified the transfer cart controls for inclusion in the safety basis consistent with requirements in DOE-STD-3007 and site procedures; however, no action had been taken to capture these controls in the safety basis. Facility management declared a PISA on Tuesday and terminated normal operations in the facility to remove criticality safety postings and segregate these carts. Following these actions, the Plutonium Facility was returned to normal operations; however, lack of these carts significantly impacts the ability to move nuclear material in the facility. LANL is pursuing safety basis changes to appropriately capture the criticality safety controls and return the carts to service.

Weapons Engineering Tritium Facility (WETF) – Work Planning: During the closeout review of a work package, a work planner identified that an independent verification of a lockout/tagout had not been performed as required. The facility operations director convened a critique that identified work planning improvements for independent verification were necessary to remove ambiguity and to ensure the appropriate checks were completed. These improvements included requiring all lockout/tagouts at WETF to have an independent verification, and that all required independent verifications be procedural steps in the integrated work document vice relying on the lockout/tagout attachment to direct this action.

Area G – Permacon Box Repackaging: A contractor readiness assessment of Permacon box repackaging line operations in Dome 231 of Area G was completed this week. The assessment was performed to ensure readiness for Hazard Category 3 (HC-3) operations in this facility. The assessment team concluded that the facility demonstrated adequate readiness for operations, and that following closure of the one pre-start finding HC-3 box repackaging operations could be performed safely and compliantly.

Area G – Safety Basis: LANL requested a temporary safety basis modification this week to allow disposition of three sealed tanks in the Sort, Segregate and Size-Reduction areas at Area G. The current Area G safety basis does not allow opening of sealed containers due to the potential for the presence of hydrogen. The temporary safety basis change proposes using the following Specific Administrative Controls consistent with the controls used at the WCRR Repackaging Facility: 1) use of non-sparking tools to loosen the lid/flange bolts sequentially; 2) stopping all spark-generating operations while the tank opening is elevated above the horizontal plane – spark generating activities shall not resume until hydrogen levels at the tank opening are measured and demonstrated to be less than 4%; and 3) workers and tanks must be grounded. The LANL request notes that additional sealed containers are expected to be identified that require remediation and notes that a formal change to the safety basis will be requested in the next 60 days.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 15, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending February 15, 2013

Weapons Engineering Tritium Facility (WETF): Following investigation into elevated tritium levels in a storage area, WETF personnel identified that a safety class tritium container (AL-M1) was leaking. AL-M1 containers are used to capture and store tritium in the Tritium Waste Treatment System (TWTS). After these containers are loaded in the TWTS, they are stored at WETF pending further processing or disposition. LANL believes the maximum allowable working pressure for this particular AL-M1 was exceeded due to pressure buildup from tritium decay and radiolysis of water. This is the second AL-M1 that has developed such a leak within the last few years. Both leaking AL-M1s are currently being stored in a fume hood to mitigate the potential for tritium release.

There are currently twelve loaded AL-M1s stored at WETF. Calculations performed to determine when the remaining canisters will exceed their maximum allowable working pressure indicate that this is possible within the next few years. To preclude additional potential leaks and to disposition the currently leaking containers, all AL-M1s will be overpacked into Flanged Tritium Waste Containers and transported to Technical Area-54, Area G for disposal. In order to perform the overpacking activity, the WETF facility will have to be placed in operations mode which is expected to occur in the next few weeks. LANL is also evaluating the feasibility and safety basis changes needed to support packaging and removal of these and other legacy tritium containers in warm standby mode.

Criticality Safety: This week, LANL began a focused training program (“boot camp”) to provide an intensive learning environment for new criticality safety staff. The program consists of nine modules including: nuclear theory; criticality safety calculation methods; ANSI/ANS, DOE and LANL criticality safety standards and requirements; criticality safety evaluations; and criticality alarm and detection systems. This program along with on-the-job training and performance demonstrations will provide a mechanism for achieving full qualification as a LANL criticality safety analyst. Conduct of the boot camp is part of the LANL corrective action plan for improving the nuclear criticality safety program (site rep weekly 11/16/12).

Plutonium Facility: The field office approved a revision to the Plutonium Facility Documented Safety Analysis and Technical Safety Requirements (TSRs) to address the Potential Inadequacy of the Safety Analysis identified last week associated with facility transfer carts. The safety basis change adds a new safety-significant TSR control for the transfer carts consistent with the nuclear criticality safety evaluation. Plutonium Facility personnel are in the process of implementing the safety basis change to resolve this issue and resume use of the carts.

Technical Area-35 (TA-35): As a part of the corrective actions to address issues with the criticality safety program at TA-35, LANL submitted an update to the Facility Hazard Categorization (FHC) this week. In 2012, a number of criticality problems were identified at TA-35 including fuel rods in Building 27 with active lengths that exceed the length identified in the criticality safety evaluation. Subsequently, LANL updated the criticality safety evaluation to include an inventory reduction for fuel rods to preclude a credible criticality accident scenario. The updated FHC is intended to strengthen controls to ensure “nature of the process” arguments are maintained and consistent with DOE-STD-1027 requirements.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 22, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending February 22, 2013

Transuranic Waste Facility (TWF): LANL submitted a revised Safety Design Strategy (SDS) to the field office this week to resolve comments from NNSA and issues identified in the Board's June 11, 2012 letter. As part of this submittal, the TWF project team performed evaluations and calculations for material at risk (MAR), the lightning protection system, metal containers (e.g. transuranic waste drums) and the fire protection system. Based on the MAR evaluation, LANL proposes to reduce the building MAR limit from 4550 plutonium equivalent-curies (PE-Ci) to 3200 PE-Ci, which reduces the overall facility MAR by approximately 30%. The revised SDS also captures waste storage containers as safety class and calls for a safety significant dry-pipe fire suppression system with passive freeze protection. In addition, the SDS captures the use of safety class vehicle barriers to preclude impact from large vehicles. Following field office review and approval of the SDS, the TWF project is expected to receive Critical Decision-2.

Criticality Safety: Last week, LANL submitted a revision to the corrective action plan and compensatory measures to strengthen the nuclear criticality safety program. This revision updates the previous plan from November 2012 and incorporates comments from the field office. The submittal letter highlights LANL senior leadership, including the laboratory director, involvement and commitment to improving the nuclear criticality safety program. The training boot camp for criticality safety analysts discussed last week continues. LANL also provided an update on the criticality safety program metrics this week. An assessment using these metrics will be performed quarterly and communicated to LANL and field office management.

Area G Drum Venting System (DVS): Following the review and approval of the corrective action plan submitted by LANL in response to the limited scope Federal Readiness Assessment conducted in December 2012, the field office authorized startup of Hazard Category 2/3 drum venting operations in Dome 33. LANL commenced Hazard Category 2/3 drum venting operations this week, representing the first drums to be processed by the DVS for the 3706 campaign.

A spot check of Dome 33 revealed that the problematic heaters with a high failure rate and a failure mechanism that includes dropping hot metal from the failed heating elements have yet to be replaced (see 11/16/12 weekly). Additionally, combustible materials that were previously identified within the heater exclusion zones had not all been removed. Site rep discussions with Area G management revealed that the work to remove the remaining combustibles is in planning; in the meantime the heaters in this area will be de-energized and tagged out. The site reps were also informed that the cognizant system engineer has identified a safer heater design and there is a management push to get the problematic heaters replaced.

Area G – Sort, Segregate, and Size Reduction (SSSR): The field office approved the temporary safety basis modification to disposition the three sealed tanks discovered during SSSR operations in Area G (see 2/8/13 weekly). Following the implementation of safety basis requirements and a verification review, LANL vented all three tanks this week in preparation for size reduction and disposal activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 1, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending March 1, 2013

Emergency Preparedness: On Tuesday, LANL conducted a series of four tabletop emergency exercises at the emergency operations center to evaluate and preplan site actions in response to a significant seismic event at Los Alamos (see 1/11/13 weekly). Participation from LANL and local, state, and federal agencies included approximately 60 personnel. These personnel represented senior field office and LANL management, Los Alamos Fire and Police Departments, local Tribal Organizations, New Mexico National Guard, New Mexico Department of Homeland Security and Emergency Management, Los Alamos Medical Center, and others.

The four scenarios presented to the participants included a collapse of the Plutonium Facility following an earthquake, and a progression of three scenarios following a significant earthquake that included the collapse of the Chemistry and Metallurgy Research Building, followed by the collapse of the WCCR Repacking Facility and finally the collapse of the Plutonium Facility. After a description of the scenario and pertinent data, the participants were divided into three groups including: strategic; response; and public information. Each group then developed solutions to three focus areas that included: rescue; communication/notification; and transportation/evacuation. Following a tabletop evaluation of options and challenges in each focus area, the groups gathered to present their solutions and options.

Conduct of this tabletop exercise highlights the challenges that LANL and the surrounding area would face during a significant seismic event because of the isolation and limited avenues for evacuation. These discussions and lessons learned will be captured in an after action report that will be used to improve procedures and processes for responding to a significant seismic event.

Transuranic Waste Facility (TWF): This week, the field office approved the Safety Design Strategy (SDS) for the TWF project that was recently submitted by LANL (see last week's report). LANL is scheduled to submit a Preliminary Documented Safety Analysis for the project in March that is consistent with the SDS.

Federal Oversight: The facility representatives (FR) for the field office continue to provide important federal oversight at LANL facilities. This week, FRs at both the Weapons Engineering Tritium Facility (WETF) and Area G identified safety issues. At WETF, the field office FR identified a maintenance work package that had conflicting information relative to the need to install a lock-out/tag-out (LOTO) for completion of the maintenance work activity. Although the LANL subject matter expert had reviewed the activity and concluded the LOTO was not required, the work instruction was not revised to remove this requirement. Instead, an email stating that the LOTO was not needed was attached to the work package.

At Area G, the field office FR identified that an operations center operator had not completed all required training and was not qualified to stand watch. This issue was identified on the backshift and resulted in a TSR violation due to failure to meet the safety basis minimum staffing requirements. Field office oversight at Area G is very important right now as LANL potentially increases the pace of operations to meet commitments for disposition of transuranic waste as part of the 3706 campaign.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 8, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending March 8, 2013

Area G – Below-Ground Transuranic (TRU) Waste Disposition: In response to a commitment in the Framework Agreement with the New Mexico Environment Department addressing TRU waste in Area G, LANL has developed a schedule for disposition of the below-ground waste requiring retrieval. The plan includes pacing milestones that will achieve removal of 2,395 cubic meters of TRU waste from Trenches A-D, Pit 9, corrugated metal pipes, and multiple shafts containing hot cell liners, tritium packages and 55 gallon waste drums, by September 30, 2018. The waste contained in these locations represents approximately 110,000 Plutonium Equivalent Curies (PE-Ci) of material at risk (99.9% of retrievable below-ground TRU waste). The plan is paced such that the amount of below-ground waste that is accumulated above-ground is minimized.

The remainder of the below-ground waste is contained within 33 shafts that house approximately 3.4 cubic meters of TRU waste containing approximately 97 PE-Ci of material at risk. The estimated cost and complexity of retrieval are both expected to be very high. As such, LANL has committed to complete an evaluation of the necessity to retrieve the waste contained within these shafts by September 30, 2015. If it is determined that retrieval of the TRU waste from the shafts is necessary, LANL plans to commence these activities in FY 2020 and last through FY 2022.

Technical Area-35 (TA-35): This week, LANL completed a Management Self Assessment (MSA) of TA-35 Buildings 2 and 27 to evaluate implementation of conduct of operations and the nuclear criticality safety program. The MSA was intended to help management evaluate improvements as part of the recovery plan for previous criticality safety issues and was focused on programs that support “nature of the process” controls and arguments for hazard categorization consistent with DOE-STD-1027. LANL recently submitted a revised Facility Hazard Categorization (FHC) that is currently under review by the field office. Activities at TA-35 Buildings 2 and 27 support training programs including nondestructive assay training for International Atomic Energy Association inspectors.

The MSA review team identified 12 findings and 2 observations primarily related to conduct of operations and training including issues in the following areas: lock-out/tag-out program; caution tag implementation; procedural compliance; training; conduct of management observation and verification reviews; building accountability; and operator aids. LANL is working on corrective actions that address the specific issues along with extent of condition reviews to ensure systemic programmatic issues are addressed. LANL is also continuing recovery plan actions and will implement controls identified in the revised FHC following field office approval.

Criticality Safety: LANL completed their quarterly assessment of the criticality safety program metrics last week as part of their overall program improvement plan. The report documents the increase in backlog of criticality safety work due to staffing issues and reiterates the group’s focus on ensuring safe operations in the field. Next week, the Criticality Safety Support Group (CSSG) will be at LANL to assess the program with a focus on capability and capacity of the current LANL criticality safety staff to support nuclear operations. The team will also be looking at the corrective action plan developed in response to the 2012 CSSG review at LANL.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 15, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending March 15, 2013

Plutonium Facility – Seismic Safety: This week, the field office submitted a memorandum to NNSA-HQ recommending that the Deputy Associate Administrator for Infrastructure and Operations approve the Safety Evaluation Report (SER) for the Plutonium Facility safety basis addendum associated with seismic performance. In January, LANL submitted an updated addendum to address review team comments and respond to the steps identified under Exigent Circumstances in the DOE memorandum dated September 17, 2012. The NNSA review team, which included subject matter experts from the field office, the NNSA Albuquerque Complex, and DOE Headquarters, developed the SER that concludes LANL adequately addresses the Exigent Circumstances for the potential post-seismic collapse. The SER also concludes that with implementation of the identified near-term risk reduction measures, the Plutonium Facility can continue to operate safely without any undue risk to the public while longer-term structural modifications are completed.

The near-term risk reduction measures proposed by LANL in the safety basis addendum include: 1) reducing the material at risk (MAR) limit for the laboratory floor; 2) reducing the MAR limit for the vault; 3) crediting newly-analyzed safety-class containers; and 4) removing one kilogram of heat source plutonium from the floor by the end of calendar year 2013. The field office memorandum notes that they plan to provide LANL with the following safety basis direction following NNSA-HQ approval: completion of items 1-3 above within 30 days; accelerated completion of item 4 above by October 1, 2013; completion of structural upgrades to resolve currently identified deficiencies (i.e. strengthen roof girders and captured columns) by March 1, 2016; and accelerated disposal and robust packaging of excess MAR including a plan for FY 13 activities within 30 days. Although the field office intends to direct completion of facility upgrades by March 2016, the LANL safety basis addendum and current schedule indicate the repairs will be complete by the end of calendar year 2014.

Area G – Safety Basis: LANL submitted a letter to the field office providing a scope of proposed changes for the approved, but not yet implemented, Area G Basis for Interim Operations (BIO) for review and approval (see 1/11/13 weekly). The proposed changes are categorized under four objectives including: reflect reduced above ground MAR limits based on waste disposition efforts; support of 3706 campaign goals; improve confidence level for successful and timely BIO implementation; and respond to previous comments (including those in the November 19, 2012, Board letter). When approved, these proposed changes will be made with the continued goal of having the BIO implemented by the end of FY13.

Chemistry and Metallurgy Research (CMR) Building – Confinement Vessel Disposition (CVD) Project: Following a series of startup delays, the CVD project Management Self Assessment is scheduled to commence on March 18, 2013. Due to the length of time that has elapsed since the start of the project, a System Adequacy Analysis (SAA) has been drafted to evaluate whether items procured as far back as 2002 meet quality assurance requirements that have changed over this time period. This SAA and a criticality safety evaluation for shipping the confinement vessels from their current storage location in Technical Area-55 to CMR will have to be completed prior to commencing operations. The current plan targets June 2013 for operational start-up, with the goal of completing one confinement vessel this fiscal year.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 29, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending March 29, 2013

Area G – Conduct of Operations: Area G management is taking a number of actions aimed at improving their conduct of operations as activities in Area G ramp up and operations continue around the clock. These actions include: assigning a second deputy facility operations director; taking a safety pause to reiterate safety and compliance over production; re-emphasizing key elements of good conduct of operations; assigning compliance representatives to observe operations; and scheduling a corporate assist assessment. Further, the management self assessment scheduled as part of the startup preparations for Dome 375 Sort, Segregate, and Size Reduce activities has been delayed one week in order to allow the time to properly execute these conduct of operations improvement actions.

Plutonium Facility: This week, the Associate Director for Plutonium Science and Manufacturing (ADPSM) directed completion of a 90 minute safety pause over the next week for First Line Managers and team leaders to cover radiological contamination issues. There has been a noticeable increase in skin and laboratory contamination events over the last few months (including three continuous air monitor alarms this week). The safety pause will communicate some of the causes involved in these events along with actions and expectations for improving the current trend. In addition to the safety pause, ADPSM is emphasizing self-monitoring, housekeeping, glove breach issues, and the sharps program to improve Plutonium Facility radiological performance.

Safety Conscious Work Environment (SCWE) Training: EM and NNSA SCWE experts conducted three all day SCWE training courses at the field office. This training was prompted by a commitment in DOE's implementation plan for Board recommendation 2011-1. To date, this course has been delivered 40 times across the complex reaching nearly 1000 trainees. The training session was highly interactive and was attended by senior LANL personnel including the lab director and field office manager.

Criticality Safety: The field office recently provided direction to LANL on nuclear criticality safety noting that NNSA is concerned about the insufficient staffing of fully-qualified criticality safety engineers to support the site's current and planned fissile material operations. The letter identifies that LANL is taking actions to address the staffing situation but that it will take more than a year to achieve a mature criticality safety program. Based on the current situation, the field office provided specific direction including the following actions:

- Curtail work on new or significantly revised Criticality Safety Evaluations unless specifically approved by the field office.
- Submit and obtain field office concurrence with the planned time-utilization for qualified criticality safety staff and subcontractors with specific justification for activities not focused on event response, field operations support or training/qualification.
- Submit and obtain field office concurrence with a ranking of fissile material operations based on maturity and level of confidence in the evaluation basis.
- Obtain near-term criticality safety expertise that can provide mentoring to new staff, review complex analytical deliverables and advise senior management on new staff qualifications.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 5, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending April 5, 2013

Chemistry and Metallurgy Research (CMR) Building – Confinement Vessel Disposition

(CVD) Project: LANL completed the Management Self Assessment (MSA) for the CVD project startup this week (see 3/15/13 weekly). The MSA team identified eight pre-start findings, most of which were related to training inadequacies, integrated work document and procedural compliance deficiencies, and non-conservative radiological work practices. The MSA team concluded that CVD operations adequately demonstrated readiness for the planned Contractor Operational Readiness Review once all pre-start findings have been resolved and the 14 post-start findings have approved corrective action plans. The Contractor Operational Readiness Review is scheduled to begin the week of April 29, 2013 with a subsequent NNSA Operational Readiness Review scheduled to begin in June 2013.

Area G – Dome 375 Box Repackaging Line: LANL commenced an MSA for the box repackaging line in Dome 375 this week. Within Dome 375 there is a large Permacon containment enclosure measuring 48 feet in width and 110 feet in length. This containment enclosure, with HEPA-filtered ventilation and automatic fire suppression, will be used to sort, segregate, and size reduce (SSSR) transuranic waste for repackaging and shipment to offsite disposal facilities.

The startup of the SSSR activity in Dome 375 is crucial to meeting commitments of the 3706 campaign as it will allow LANL to process the largest fiberglass reinforced plywood waste boxes in Area G, some of which are nearly 40 feet in length. Following successful completion of the MSA, and follow-on Contractor and Federal Readiness Assessments, boxes containing up to Hazard Category (HC)-2 quantities of transuranic waste will be processed within this facility. Startup of HC-2 activities are currently planned for August 2013.

Weapons Engineering Tritium Facility (WETF): LANL recently returned WETF to operations mode (previously in warm standby mode) in accordance with the Technical Safety Requirements. Certain gloveboxes that did not pass leak testing remain in warm standby. With this mode change, WETF personnel are moving forward on plans to overpack AL-M1 tritium containers (including the leaking AL-M1 containers noted in the 2/15/13 site rep report) into Flanged Tritium Waste Containers for disposition at Area G. Because of the length of time since previous tritium gas handling operations, LANL is pursuing readiness reviews to support restart of tritium transfer, function test, and processing activities. The MSA to support these activities is scheduled to begin this month followed by Contractor and Federal Readiness Assessments in May 2013 and June 2013, respectively.

Transuranic Waste Facility (TWF): The field office approved extending the schedule for submittal of the Preliminary Documented Safety Analysis for the TWF Project this week from March 2013 to July 2013. TWF project personnel plan to use this time to implement changes in the safety basis approach that are detailed in the safety design strategy approved by the field office earlier this year (see 2/22/13 site rep report). The project also recently received approval of Critical Decision-2, *Performance Baseline*.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 12, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending April 12, 2013

The field office announced that Geoff Beausoleil will be assigned as the acting Field Office Manager for 60 days while a permanent manager is being identified. Mr. Beausoleil is currently the Sandia Field Office Manager and was previously the Deputy Manager at the Pantex Site Office.

Plutonium Facility – Seismic Safety: This week, the field office provided LANL with the Safety Evaluation Report (SER) for the safety basis addendum associated with facility seismic performance (see 3/22/13 site rep weekly). The SER was approved by the NNSA Deputy Associate Administrator for Infrastructure and Operations. The field office transmittal letter includes direction for the contractor to “prudently accelerate disposal and robust packaging of excess material-at-risk.” LANL is directed to provide a plan within 30 days on FY13 objectives for this acceleration and the impact on offsite dose calculations. Other compensatory measures, including material-at-risk limits and qualification of a new robust container, are scheduled to be complete within 30 days. NNSA also continues to pursue the alternate static nonlinear analysis.

Criticality Safety: LANL recently published the results of its Criticality Safety Officer (CSO) Program Assessment at Technical Area-55, the Chemistry and Metallurgy Research Building, and Area G. Numerous concerns in the program were self-identified that will be resolved to help strengthen the CSO Program and ultimately the LANL Nuclear Criticality Safety Program. The identified deficiencies included: insufficient CSO staffing; no established training and qualification programs; limited definition of CSO duties and responsibilities; and insufficient CSO operational oversight and field support. LANL is developing corrective actions to address these deficiencies. LANL also continues to pursue broader corrective actions consistent with the criticality safety corrective action plan.

Area G – Dome 375 Box Repackaging Line: This week, LANL completed the Management Self Assessment for the box repackaging line in the Dome 375 Permacon (see last week’s report). LANL is expecting to move on to its next phase of startup activities with a contractor readiness assessment beginning on April 22, 2013.

Safety Basis: On Tuesday, LANL declared a site-wide Potential Inadequacy of the Safety Analysis (PISA) for nuclear facilities because of increased airport traffic at the Los Alamos County Airport. As part of the safety basis, LANL nuclear facilities evaluate the frequency of aircraft crash in accordance with DOE-STD-3014. A recent increase in commercial flights at the airport prompted LANL to review the airport traffic data that is part of the input information for the DOE standard evaluation. In addition to the new commercial flights, review of airport logs indicates an increase in other flight traffic. Based on this information, LANL declared the PISA and will complete an unreviewed safety question for each nuclear facility. Currently, no compensatory measures have been identified. Initial evaluation indicates that the RANT shipping facility, which previously had an aircraft crash probability just below the cutoff frequency, may now require inclusion of an aircraft crash scenario and associated controls in the safety basis. LANL also plans to evaluate this information for the Transuranic Waste Facility Project.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 19, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending April 19, 2013

Criticality Safety: LANL paused activities associated with 17 fissile material operations (FMOs) this week at the Plutonium Facility, Area G and within the Packaging and Transportation Division because outstanding field office comments and issues have not been appropriately resolved. A Criticality Safety Support Group assessment completed in April 2012 concluded that LANL demonstrated an inability to close outstanding criticality issues in a timely manner. As part of the corrective action plan for the assessment, LANL performed an extent of condition review to identify if there are legacy issues identified in the criticality safety database. The extent of condition review revealed 17 FMOs where the field office had identified high-level (the most significant) issues with the associated criticality safety evaluations (CSEs), some dating back to 2007, that have not been resolved. A critique on the issue identified that no formal, documented process previously existed to manage field office comments on CSEs. LANL is working to formalize the process and to determine the path forward for each of the 17 paused FMOs.

LANL also completed their evaluation of all FMOs across the site (approximately 500) to determine the confidence level ranking based on the technical basis for the CSE and other factors. In addition to the 17 FMOs identified above, LANL concluded that another 17 FMOs had low confidence (“red”) technical basis that needs to be addressed.

Weapons Engineering Tritium Facility (WETF): This week, LANL commenced a Management Self Assessment to support the restart of tritium transfer, function test and processing activities. The assessment team identified that a two-year re-qualification examination for operators may have been compromised because the examinations were available through the WETF online document management system for nearly a month prior to being administered. Most of the operators had taken a written examination within the required two year time frame and remain qualified. However, an operator that had performed surveillances within the past week had not taken an examination within the past two years and as such could not be considered qualified. As a result, WETF management declared a technical safety requirement non-compliance. Plutonium Facility and Area G management declared TSR non-compliances for similar qualification issues within the last four months (see the 11/23/12 and 3/1/13 weekly reports).

Plutonium Facility: Operators identified two General Purpose Heat Source (GPHS) items contained in a Plutonium Facility glovebox that were bulging due to an apparent internal pressure build-up. The encapsulated GPHS is credited in the safety basis with providing safety-class confinement (damage ratio of zero) for heat source-plutonium (HS-Pu). When discovered, facility management declared the bulging heat source items inoperable, entered a limiting condition for operation based on the potential for exceeding glovebox material limits, and recalculated the inventory in the glovebox using a damage ratio of one (accounting for all of the HS-Pu). The recalculation showed that no material limits were violated. Facility and program personnel are evaluating the history of the bulging items and have entered the new information process as they develop their plan to resolve the over-pressure condition.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 26, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending April 26, 2013

Staff members M. Horr and B. Sharpless were onsite this week to observe the Contractor Readiness Assessment (CRA) of oversized container Sorting, Segregating, Size-Reducing, and Repackaging activities in Area G, Dome 375. The staff observed field operations and interviews conducted by the CRA team. Based on feedback from the staff, the CRA team is revising their implementation plan (IP) to include specific criteria for each IP core requirement as required by the LANL readiness procedure. The CRA is scheduled to continue through the end of next week.

Weapons Engineering Tritium Facility (WETF): LANL continues to struggle with achieving sustainable tritium processing capability at WETF, which is needed to support de-inventory activities. The following items highlight recent issues with restarting WETF tritium operations:

- **Management Self Assessment (MSA):** This week, the MSA team completed their review of tritium operations and concluded that WETF is not ready for operations. The team identified that the current gap between the WETF operational readiness status and that required for a Hazard Category 2 Nuclear Facility is too large to recommend startup. From a high level standpoint, the MSA team concluded that there were significant issues associated with the organization structures, work processes (including the backlog of unresolved issues) and plant equipment. In addition to a number of readiness prerequisites that were not met, the team identified 15 pre-start and 14 post-start findings.
- **Safety System Oversight (SSO) Review:** The field office recently completed a SSO review of contractor-approved conduct of engineering variances and alternate methods (mostly related to pressure safety issues at WETF). The review identified five findings including a significant concern with the LANL review and basis for approving variances. The SSO team concluded that many variances: 1) are not compliant with ASME pressure safety requirements; 2) potentially constitute unreviewed safety questions based on the need for compensatory measures and/or operating restrictions; and 3) were inappropriately approved by the LANL Site Chief Engineer. LANL and WETF personnel are reviewing the assessment report.

Criticality Safety: This week, LANL completed a review of the adequacy of closed corrective actions taken in response to previous criticality safety assessments. This review was performed as part of the corrective action plan to strengthen and improve the criticality safety program and to respond to findings identified by an April 2012 NNSA Criticality Safety Support Group (CSSG) assessment (see 11/16/12 weekly). Among other things, the review identified: 1) that 12 issues tracked to closure in the LANL Performance Feedback and Improvement Tracking System lacked sufficient closure documentation; 2) 103 comments received from the field office should be reopened due to insufficient evidence that necessary changes to criticality safety technical documents had been made; and 3) several Criticality Safety Evaluation Documents with comments questioning their adequacy that had not been resolved in a timely manner. LANL is currently working to prioritize all issues that have been identified with the criticality safety program in order to focus available resources on implementing effective corrective actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 3, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending May 3, 2013

Weapons Engineering Tritium Facility (WETF): Last week, the field office provided LANL with comments on the proposed safety basis that was submitted last year. The current safety basis has not been substantially updated since 2002. The comments identify numerous deficiencies including an overreliance on administrative versus engineered controls, inadequate fire protection controls, and issues with the hazard analysis methodology. The field office memo directs LANL to document the planned disposition of all stored tritium including identification of legacy materials and justification for continued storage of this material at WETF. In addition, LANL is directed to submit a path-forward to upgrade the safety basis in a manner that is integrated with mission requirements, projected inventory needs, and appropriate assurance of continued safe operations.

Area G – Dome 375 Box Repackaging Line: LANL completed its contractor readiness assessment (CRA) for Sorting, Segregating, Size Reduction and Repackaging (SSSR) activities in Area G, Dome 375. The CRA team concluded that once the four identified pre-start findings have been closed and corrective actions have been developed for nine post-start findings, Hazard Category (HC) 3 SSSR operations can be safely and compliantly performed in the Dome 375 box repackaging line. One pre-start finding identified that there is a limited ability for the supervisor, who is stationed outside the SSSR enclosure, and workers within the enclosure to communicate. This was also identified by the Board's staff during their recent visit (see 4/26/13 weekly).

Chemistry and Metallurgy Research (CMR) Building – Confinement Vessel Disposition (CVD) project: This week, LANL commenced the Contractor Operational Readiness Review (ORR) for the CVD project. This Contractor ORR is a prerequisite to the Federal ORR currently scheduled to begin the first week of June that will evaluate the readiness of the CVD project to commence HC 2 operations. This startup activity is necessary to clean out and disposition the confinement vessels currently stored in Technical Area-55 (TA-55).

Conduct of Critiques: The Associate Director for Nuclear and High Hazard Operations recently emphasized with Facility Operations Directors the importance of conducting high quality critiques. This emphasis included reiterating expectations for critiquing all anomalous events, conducting critiques in a timely manner, and ensuring the appropriate personnel, including the involved workers, attend scheduled critiques.

Criticality Safety: Consistent with the corrective action plan, the laboratory completed criticality safety assessments at LANL nuclear facilities this week. The review teams identified 3, 4, and 6 findings for TA-55, CMR, and Area G, respectively. In all cases, the assessment teams concluded adequate implementation of the Criticality Safety Program with the exception of identified findings. Notably, one of the findings at Area G identified that supervisors and operations center personnel did not have an adequate understanding of criticality safety requirements. Area G management paused operations based on this finding and conducted appropriate training to resolve this issue. The assessment team also identified findings related to criticality safety staff formally reporting issues to management and the lack of a formal process to track and close criticality safety issues.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 10, 2013

MEMORANDUM FOR: S. A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending May 10, 2013

Chemistry and Metallurgy Research (CMR) Building – Confinement Vessel Disposition

(CVD) Project: This week, LANL completed the Contractor Operational Readiness Review (CORR) for the CVD project. The CORR team concluded that following adequate closure of their 15 pre-start findings, CVD operations could be safely executed. The team also identified 11 post-start findings and 13 observations. Although there were a significant number of findings, the team lead noted that operators and supervisors demonstrated excellent process knowledge and conduct of operations. The review team also concluded that the pre-starts did not represent indications of systemic failures in CVD operations.

Criticality Safety: The LANL Nuclear Criticality Safety Committee (NCSC), chaired by the Principal Associate Director for Operations and Business, met this week to review the status of the corrective action plan, results from recent evaluations and assessments, and progress on criticality safety analyst training and qualification. The committee decided to move forward with selection and inclusion of criticality safety experts (both internal and external to LANL) as part of the NCSC, which is consistent with a recent recommendation from the DOE Criticality Safety Support Group.

Safety Basis: LANL submitted an Evaluation of the Safety of the Situation (ESS) to the field office associated with increased airport traffic at the Los Alamos County Airport (see 4/12/13 weekly). An Unreviewed Safety Question (USQ) for the RANT shipping facility was identified based on the increase in flight traffic causing the frequency of the aircraft crash scenario to cross the threshold from beyond extremely unlikely to extremely unlikely. The evaluation did not identify USQs for other LANL nuclear facilities. In accordance with DOE-STD-3014-2006, *Accident Analysis for Aircraft Crash into Hazardous Facilities*, the RANT Documented Safety Analysis (DSA) must now include an aircraft crash as a design basis accident vice the beyond design basis accident recognized in the current DSA. The ESS identified that LANL will update the DSA to include an aircraft crash as a design basis accident in the next annual DSA revision.

Weapons Engineering Tritium Facility (WETF): This week, LANL began overpacking AL-M1 tritium containers into Flanged Tritium Waste Containers for disposal at Area G. Some of these AL-M1s have a history of leaking and others have been identified as having the potential to leak in the future (see 2/15/13 weekly). Disposal of the AL-M1s represents the first of many activities needed to de-inventory excess tritium currently stored in WETF.

WETF personnel identified expired calibrations for subcomponents associated with the safety significant environmental chamber over temperature protection system (ECOPS). The system was declared inoperable and the appropriate limiting condition of operation was entered. The calibration was checked as satisfactory during the previous annual inspection of the ECOPS last fall; however, WETF personnel did not capture the calibration expiration date to drive the due date for the next surveillance as required by the procedure (the subcomponent has a calibration periodicity of 18 months). During a critique of this event, WETF management identified actions to improve the surveillance procedure and perform an extent of condition review.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 17, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending May 17, 2013

Plutonium Facility: This week, LANL provided the field office planned actions for FY 13 to prudently accelerate disposal and robust packaging of excess material at risk. The field office requested this action as part of the approval of the Plutonium Facility safety basis addendum associated with facility seismic performance. LANL commits to robustly repackage and dispose of specific quantities of weapons grade plutonium currently stored in the vault. Although the actions do not significantly reduce potential offsite dose consequence that are evaluated in the safety basis for a challenging seismic accident scenario, the effort will continue to improve the vault storage configuration and provide additional space to relocate material from the laboratory floor.

Technical Area-48 Radiochemistry Laboratory (RC-1): On Wednesday, a worker at RC-1 was splashed with a small amount of uranyl nitrate solution (depleted uranium) when a glass sample container in a hood over-pressurized and burst. Immediate actions were taken to wash the worker's hands and face at an eye wash station. The worker was transported to occupational medicine and was subsequently released with no restrictions. Whole body surveys and nasal smears taken following the event did not identify personnel contamination.

Although similar experiments had been conducted in RC-1, this new activity involved multiple glass containers with limited headspace and varying molar concentrations of nitric acid. The potential for a pressurization hazard was identified in the Integrated Work Document (IWD) and action was taken to vent the containers during the initial stages of the experiment. However, the samples were left in a sealed configuration for an extended period of time when the activity was interrupted. Shortly after the worker returned to the area and relocated the sealed containers to a hood, the overpressure event occurred, breaking 9 of the 11 glass containers. RC-1 management is pursuing corrective actions including lessons learned, improvements in the IWD, and evaluation of engineered containers that will release pressure.

Plutonium Facility – Safety Basis: This week, the field office provided comments to LANL on their proposed annual updates to the Technical Area-55 Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR). The field office directed LANL to revise the DSA and TSRs to incorporate resolution of the provided comments within 90 days of their receipt.

Area G – Lightning Protection System: Sorting, Segregating, Size Reduction and Repackaging activities were paused this week in domes 375 and 231. The pause was due to facility personnel identifying that scaffolding had been erected within the specified arc flash standoff distance without proper bonding to the lightning protection system. This was contrary to an administrative control for combustible loading that is an element of the fire protection program.

Radiological Laboratory, Utility, and Office Building (RLUOB): LANL began their Management Self Assessment (MSA) this week to evaluate the startup of radiological operations at RLUOB. The MSA is scheduled to complete next week. Further startup activities will follow to provide additional less than Hazard Category 3 analytical chemistry capabilities at RLUOB.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 24, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending May 24, 2013

Staff members D. Kupferer, J. McComb, and J. Plauue were on site this week to conduct a review of criticality safety. The review focused on site-wide and facility specific Criticality Safety Program implementation, impacts on limited criticality safety staffing resources, and federal oversight.

Plutonium Facility – Criticality Safety: Over the past week the Plutonium Facility has experienced a number of criticality safety infractions and process deviations. Several of these issues were self-identified and conservative action was taken to respond, critique, and develop corrective actions. However, these infractions and deviations indicate potential conduct of operations and Criticality Safety Evaluation (CSE) issues that emphasize the need for LANL to continue criticality safety improvements.

- During a system walkdown, the Board’s staff identified material located within a workstation that was not allowed by the CSE. This infraction was due, in large part, to inconsistent understanding of criticality safety requirements regarding the boundaries of the workstation and failure to follow good work practices as prescribed in the CSE. Because this is one of multiple infractions that have occurred in this particular room over the past few months (including inconsistent interpretation of requirements between facility and criticality safety personnel), operations have been paused in this room while operators and criticality safety personnel ensure limits specified in CSEs and postings are clear and well understood.
- A criticality control mass limit was exceeded in a vault location. Workers identified that two containers intended to be stored in certain locations had been inadvertently swapped when initially moved to the vault. This transposition resulted in one location exceeding the mass limit prescribed in the CSE.
- A process deviation occurred when liquid level was discovered in a trap tank sight glass for a wet vacuum system. Liquid is not normally expected to be located in this portion of the system. The CSE requires that if liquid is discovered that the source be located and the liquid be returned to the source. The source of the liquid has yet to be determined and the liquid could not be returned to its source regardless due to the system configuration. During review of this issue, Plutonium Facility personnel identified that the system configuration differed from the CSE description.
- During an extent of condition review, liquid was identified in another wet vacuum trap tank sight glass. The source of this liquid has yet to be determined as well.

Plutonium Facility – Personnel Contamination: A Plutonium Facility worker was identified with skin contamination after removal of a temporary foam plug used during a glovebox pressure test. Nasal smears following the discovery of contamination were positive. The foam plug was installed over an existing temporary plug that had been installed more than a decade ago but was not sufficiently airtight to allow the pressure test to pass. During this activity, the two plugs adhered to each other such that when the new plug was removed the old plug was removed as well resulting in the spread of contamination. Facility management is conducting an extent of condition review to determine whether additional “temporary” plugs are being used as contamination boundaries.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 31, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending May 31, 2013

Plutonium Facility – Criticality Safety: Operations remain paused in the room where the Board’s staff identified a criticality infraction during their recent on-site criticality safety review (see 5/24/13 weekly). Operators, engineers, criticality safety and facility operations personnel are walking down each operation within this room to ensure that the criticality safety controls are clearly understood and adequately captured in procedures and postings. Additionally, the walkdowns are being used to verify that procedures can be followed as written and reflect the work as it is actually performed.

Radiological Laboratory, Utility, and Office Building (RLUOB): This week, LANL completed their Management Self Assessment (MSA) to commence radiological operations with less than Hazard Category 3 nuclear materials at RLUOB. The team identified 6 pre-start findings and 4 post-start findings during the review; however, the manageable list of open issues at the start of the MSA included a number of items that the team considered pre-start findings. The MSA team recommended that radiological operations be authorized following closure of all pre-start findings.

During RLUOB construction, a limited number of laboratory rooms included installation of analytical chemistry equipment. The other laboratory rooms have support services (e.g. electrical, water, air) stubbed off and the rooms are empty. As part of the overall plutonium strategy to support analytical chemistry requirements and closure of CMR in 2019, LANL plans to install additional capability in the vacant laboratory rooms and increase the material limit to 38 grams Pu-239 equivalent consistent with the NNSA supplemental guidance on DOE Standard 1027.

Area G – Safety Basis: The field office provided comments from their review of LANL’s revised submission of the Area G Basis for Interim Operations (BIO) and Technical Safety Requirements (TSR). The field office directed LANL to incorporate resolution of these comments within 30 days to support implementation of the BIO and TSRs by September 2013.

Lightning Protection Systems: The field office conducted an assessment of LANL’s Lightning Protection System Program from November 2012 to January 2013. The assessment identified eleven findings, two observations, and one noteworthy practice. The assessment team noted that it was particularly concerned with the lack of rigor placed on maintenance of lightning protection systems and noted instances of system deficiencies that have been identified but not corrected for several years.

Area G – Dome 375 Box Repackaging Line: This week, the field office issued its implementation plan for the Federal Readiness Assessment (FAR) of Hazard Category 2 Sort, Segregate, Size Reduction and Repackaging Operations at Area G Dome 375 (see 4/5/13 weekly). The FRA is currently scheduled to commence on July 8, 2013.

Safety Basis: In January, LANL provided the field office with a safety basis improvement plan to address issues in staffing, training, and qualification and to improve the overall quality and timeliness of safety basis submittals. The field office provided comments on the scope and details of the plan and requested resubmittal of this document in December 2013. Although improvements have occurred in some areas, LANL continues to struggle with the quality of safety basis documents (see 5/3/13 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 7, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending June 7, 2013

Plutonium Facility – Criticality Safety: LANL continues to evaluate fissile material procedures and operations in the room where operations were recently paused (see 5/24/13 and 5/31/13 weeklies). As part of the review this week, Plutonium Facility workers identified two containers stored in a safe that do not comply with criticality safety limits. Appropriate actions were taken to secure the room, inform criticality safety personnel, and conduct a critique. The criticality safety limit approval includes an operational requirement that container outside diameter be greater than 6.5-inches to protect spacing assumptions in the criticality safety evaluation. This requirement is also identified on the posting. During the critique, operators noted that they were focused on the mass limits when storing items in the safe. A criticality safety infraction was declared for two containers that were identified with an outer diameter of less than 6.5-inches.

In addition to the ongoing review of activities for this specific laboratory room, LANL management is also developing a corrective plan that includes an extent of condition review for other areas of the Plutonium Facility. On Friday, the field office provided direction to LANL on improving the criticality safety program implementation and operational performance. The memorandum forwards the Criticality Safety Support Group report from their March 2013 assessment and a summary of issues from the recent Board staff review in May 2013. LANL is requested to review this information along with the results of the extent of condition review at the Plutonium Facility and provide a path forward on improving criticality safety.

Plutonium Facility – Conduct of Operations: During the conduct of a surveillance test procedure plutonium facility personnel recognized that performance of the procedure was not being accomplished as written. The affected operation has been paused until the procedure can be walked down and revised by operators and supervisors to ensure it can be performed as written and accurately describes the work activity.

Weapons Engineering Tritium Facility (WETF): Recently, the WETF function tester glovebox unexpectedly experienced a sharp increase in tritium levels. Levels in the glovebox peaked at approximately 3000 millicuries per cubic meter. The glovebox system functioned as required to purge the glovebox and the tritium was recovered by the Tritium Waste Treatment System (TWTS). There was no release of tritium to the environment. However, tritium levels in the glovebox remained elevated indicating a continuing release. Subsequent investigation identified that a previously tested item that was being stored in the glovebox was the source of the tritium release. WETF personnel plan to overpack the item in the near future; however, the oxygen monitoring system associated with the low pressure receiver in the TWTS is required to be operational to support introducing the overpack into the glovebox. These repairs are on-going.

Area G – Dome 375 Box Repackaging Line: The field office has approved the corrective action plan from the Dome 375 Sort, Segregate, Size Reduction and Repackaging (SSSR) Contractor Readiness Assessment (CRA). LANL has closed all of the pre-start findings from the CRA. Following these actions, the field office approved the startup of Hazard Category 3 SSSR operations in the Dome 375 box repackaging line.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 14, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending June 14, 2013

Staff members M. Horr, T. Hunt, and J. Pasko were on site this week to review the conduct of operations in Technical Area-54, Area G. The staff team evaluated the implementation of conduct of operations elements prescribed in DOE Order 422.1, *Conduct of Operations*, and local LANL requirements, and focused on Sorting, Segregating, Size Reduction, and Repackaging activities.

Plutonium Facility – Criticality Safety: The LANL Deputy Director provided the field office with an action plan to improve conduct of operations and criticality safety this week at the Plutonium Facility. The action plan stems from recent infractions identified in a specific laboratory room by field office and DNFSB staff personnel. The plan includes the following actions: 1) pause of operations in the room (complete); 2) process walkdown of all glovebox operations and activities in this room (complete); 3) identify requirements for resuming operations (due 6/15/13); 4) issue memo to facility workers restating requirement for verbatim compliance to procedures (complete, discussed below); 5) evaluate extent of condition by performing process walkdowns for 13 other process operations at the Plutonium Facility (due 6/28/13); 6) review all assessments and evaluations of Plutonium Facility operations over last 12 months to ensure appropriate corrective actions have been identified (due 6/21/13); 7) develop a comprehensive operations improvement plan based on walkdowns and assessment review (due 7/5/13); 8) assess the effectiveness of the operations improvement plan (1st quarter FY14); and 9) perform a facility centered assessment of criticality safety at the Plutonium Facility (1st quarter FY14).

On Thursday, the Associate Director for Plutonium Science and Manufacturing issued a memo to workers on procedure adherence requirements stating that “two of the most critical elements of safe operations are that written technical procedures define the proper operational parameters and controls and that those procedures are followed as intended.” The memo reiterates that technical procedures (including reference and use every time) are to be followed as written, without exception, and that work should be paused if a procedure step is confusing or difficult to understand.

Weapons Engineering Tritium Facility (WETF): This week, WETF personnel entered a limiting condition of operation (LCO) for the oxygen monitoring system in the Tritium Waste Treatment System (TWTS). The LCO was entered after it was discovered that a pump associated with the oxygen monitoring system had been inadvertently secured while performing corrective maintenance on the TWTS. The pump was secured due to ambiguous language in an attachment to the integrated work document in use that directed the TWTS be shut down. During the critique, it was identified that the operators were unaware that shutting down the TWTS would secure this pump and require entry into the LCO condition. WETF management is pursuing corrective actions to clarify the work documents.

Chemistry and Metallurgical Research (CMR) Facility – Confinement Vessel Disposition (CVD): The field office conducted an ancillary review of the CMR Documented Safety Analysis and Technical Safety Requirements that generated comments related to the CVD project. Comments identified an inadequacy in the design of the safety significant sphere rotation brake system and incomplete performance criteria to ensure the confinement safety function of the CVD workstation/glovebox is satisfied. As a result the Operational Readiness Review scheduled for June 17, 2013, has been delayed until these issues can be resolved.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 21, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending June 21, 2013

On Wednesday, the staff conducted a teleconference with NNSA and LANL personnel to follow-up on Plutonium Facility criticality safety topics.

Criticality Safety: This week, LANL responded to the recent field office request to evaluate and provide a path forward on the following items: 1) summary of DNFSB staff issues identified during the May 2013 review; 2) final report from Criticality Safety Support Group March 2013 assessment; and 3) the ongoing extent of condition reviews at the Plutonium Facility. In addition to the action plan communicated last week, LANL plans to develop a criticality safety roadmap by October 2013 that integrates improvement actions into a comprehensive “get well” plan. The roadmap will include actions to address criticality safety compliance issues identified by past self-assessments and independent assessments, including the DNFSB staff review.

On Thursday, the chairman on the site Nuclear Criticality Safety Committee (NCSC) held a special meeting to discuss plans for conduct of a criticality safety program assessment, which is scheduled to be complete by the end of July, and NCSC membership. Based on discussion during the meeting, the criticality safety group will evaluate the current subjective status in each of the assessment areas identified in DOE Standard 1158, *Self-Assessment Standard for DOE Contractor Criticality Safety Programs*, to determine the most effective areas to focus this assessment. The committee is also moving forward to select internal and external candidates for membership on the NCSC. Based on questions and discussion during the staff visit in May, the NCSC is putting together a study group to determine the LANL institutional positions on inclusion of criticality safety controls into procedures, container labeling, and improvements to the annual fissile material operation walkdowns.

Plutonium Facility – Criticality Safety: LANL paused operations in a facility glovebox based on concerns identified by the field office criticality safety subject matter expert. The current location of tape demarking a pass through lane in the glovebox would not allow compliance with criticality safety limit approval controls. Because the pass through lane has not been used recently, no criticality safety infraction was declared. Plutonium Facility personnel are pursuing a path forward to correct the situation and resume operations, and are developing a lesson learned package.

Weapons Engineering Tritium Facility (WETF): This week, LANL submitted its schedule to resolve field office comments on proposed changes to the WETF Documented Safety Analysis and Technical Safety Requirements (see 5/3/13 weekly). The submission also included a description of a draft project execution plan to dispose of legacy tritium items currently being stored in WETF. These items include: 1) legacy items from closure of various sites that retain no programmatic interest; 2) bulk tritium gas with no programmatic use; and 3) tritium recovered during operation of the Tritium Waste Treatment System. The disposition of this legacy tritium is important as it constitutes nearly half of the tritium inventory in the facility and has been the source of tritium leaks in the past. The execution plan will identify funding sources and facility systems necessary to process the legacy tritium for disposition. LANL intends to use the Integrated Nuclear Planning process to determine whether a partial facility restart aimed solely at legacy tritium disposition is appropriate versus a full facility restart that would also allow resumption of programmatic operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 28, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending June 28, 2013

Staff members P. Foster and A. Gwal were on site this week to review the Technical Area 55 electrical distribution system and the LANL electrical safety program.

Plutonium Facility – Criticality Safety: On Thursday, the Laboratory Director paused programmatic activities at the Plutonium Facility. The pause was directed based on issues identified during procedural and criticality safety reviews and findings from recent assessments. The Director communicated to all LANL personnel the importance of ensuring procedures and operational processes are being executed appropriately. Additionally, the memorandum emphasized the importance for employees to raise concerns and for leaders to take action on those concerns. The Principal Associate Director for Weapons Programs and the senior management team have been tasked to evaluate the way work is executed and to determine what process and procedure improvements are needed as well as determining a path forward to continuous improvement. Individual operations at the Plutonium Facility will be resumed once necessary updates and enhancements have been achieved.

The procedure and criticality safety implementation reviews that led, in part, to the pause of operations continued this week at the Plutonium Facility. These reviews have identified a number of procedural issues and the need for clarification and improvement of criticality safety controls. As a part of this review, Plutonium Facility personnel also identified a safe drawer with dimensions that are not in compliance with the Criticality Safety Limit Approval (CSLA). The drawer dimensions are identified as an engineered feature that should have been verified as a part of implementing the CSLA. This issue resulted in a criticality safety infraction.

Stage 3 Fire Restrictions: Due to the ongoing drought and the current extreme fire danger level in the area, LANL has entered stage 3 fire restrictions. Entering stage 3 fire restrictions limits activities that increase the risk of starting a fire and have a direct impact on LANL explosives testing. Additionally, access to most recreational areas for walking, hiking, jogging, biking and similar activities is prohibited. The fire restrictions are currently expected to be in effect through August 3.

Safety Basis: LANL submitted a revised Evaluation of the Safety of the Situation (ESS) following a site-wide assessment for new air service between Los Alamos and Albuquerque (see 5/10/13 weekly). The revised ESS indicates that the increased air traffic resulted in positive Unreviewed Safety Questions for Technical Area 55, the RANT shipping facility, Area G, and the Nuclear Environmental Sites. The ESS indicates that there is not an imminent hazard associated with the increase in air traffic in the vicinity of LANL and that the affected DSAs will be updated as necessary to reflect this increased risk during the next annual update.

Area G – Safety Basis: In March 2012, the field office approved a major revision to the Area G safety basis to replace the current safety basis that was originally approved in 2003. However, this document was not implemented in the field. Instead, LANL developed a strategy to revise the new safety basis to account for the reduction of material at risk and to improve and simplify the document. This week, LANL re-submitted this new safety basis to the field office for approval. Following field office approval, LANL plans to implement the new safety basis by the end of the fiscal year.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 5, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending July 5, 2013

Plutonium Facility – Criticality Safety: Based on direction from the Laboratory Director, fissile material operations at the Plutonium Facility remain paused this week. On Monday, the Associate Director for Plutonium Science and Manufacturing (ADPSM) provided the following guidance and clarifications to Plutonium Facility programmatic personnel:

- All programmatic operations that involve nuclear materials are paused until further notice.
- Material movement and process operations required to place nuclear materials in a safe and stable configuration are allowed but require specific approval from the Principal Associate Director for Weapons Programs.
- Facility support activities (e.g. surveillances, glove changes, filter changes, and removal of low-level waste) are permitted but must be approved by the TA-55 Facility Operations Director (FOD).
- Laboratory construction, reconfiguration, and cleanout activities with no potential to impact the configuration of nuclear materials are allowed with the approval of the TA-55 FOD.
- Laboratory construction, reconfiguration, and cleanout activities with the potential to impact the configuration of nuclear materials are paused; however, release of individual activities with a specific duration may be approved based on rigorous evaluation and justification that includes approval by the Laboratory Director.
- Walkdowns of Plutonium Facility laboratories and processes to evaluate procedures and criticality related controls are permitted provided they can be performed without affecting the safe and stable configuration of nuclear materials.
- Tours of the facility and individual laboratories are permitted.

The memorandum notes that all requests to resume normal operations must be approved by the Laboratory Director and that ADPSM is developing a formal process to obtain this approval.

Area G – 3706 Campaign: Area G personnel recently announced that they successfully completed removal of above ground, non-cemented transuranic (TRU) waste from Area G to meet the FY 2013 3rd quarter goals of the 3706 campaign. This keeps the project on pace to meet commitments in the framework agreement with the state to remove 3706 m³ of above ground, non-cemented TRU waste from Area G by June 30, 2014.

Chemistry and Metallurgical Research (CMR) Facility – Confinement Vessel Disposition (CVD): CMR personnel continue startup activities in CMR Wing 9 to support retrieval and disposition of nuclear materials contained in nine large confinement vessels currently stored at TA-55. LANL submitted proposed resolution of comments generated during an ancillary review of the CVD project safety basis (see 6/14/13 weekly) to the field office for review and approval. This resolution includes a CMR Documented Safety Analysis/Technical Safety Requirement page change to address field office concerns. Following field office approval of the page change and successful completion of an implementation verification review, the project will proceed with the Federal Operational Readiness Review, which is currently scheduled to commence in August 2013.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 12, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending July 12, 2013

Criticality Safety: The Laboratory Director's pause of fissile material operations in the Plutonium Facility remains in effect. A senior management team, with the active involvement of the Laboratory Director, continues to work on developing a resumption plan. Plutonium Facility personnel continue their process walk-downs to revise and validate procedures and criticality safety-related controls. These walk-downs have identified additional process deviations and criticality safety infractions. For example:

- A Criticality Safety Limit Approval (CSLA) specified a certain type of container could be stored in a specified location. The procedure used to move the containers had been updated to identify an additional type of container for use, but did not receive a review by Criticality Safety Analysts (CSA). As a result containers that had not been approved on the CSLA or evaluated in the associated Criticality Safety Evaluation Documentation (CSED) were being stored in this location.
- Multiple safe drawers have been discovered with dimensions that are not in compliance with the engineered features specified on the CSLA. This is primarily due to the ambiguous term "nominally" being used by the CSLA and CSED to identify dimensions.
- Five solution tanks were found to have different actual volumes than that specified on the CSLA. Again, this was complicated by the use of the term "nominally" by the CSLA and CSED to identify volumes.

This week, LANL submitted a report on the time-utilization of qualified CSAs to the field office for review. The report identifies that the qualified CSAs spent over 85% of their time during the past eight weeks providing floor support for fissile material operations and assisting with the extent of condition review ongoing in the Plutonium Facility. The report states that due to the time being spent assisting with efforts in the Plutonium Facility little progress is being made on performing Criticality Safety Evaluations needed to support other activities.

Fire Restrictions: The Laboratory and surrounding areas have received a significant amount of rainfall over the past week. As such, all fire restrictions (see 6/28/13 weekly) have been lifted.

Safety Basis: LANL recently submitted a revision to the Unreviewed Safety Question (USQ) institutional procedure. In addition to resolving previous field office comments, the revision clarifies the USQ integration with the LANL New Information process. Notably, the procedure now requires LANL to determine whether a Potential Inadequacy of the Safety Analysis exists within nine working days of entering the New Information process.

Radioactive Liquid Waste Treatment Facility (RLWTF): RLWTF management identified that a required quarterly surveillance (due 7/6/13) associated with facility HEPA filters was not completed as required by the safety basis. The surveillance was successfully completed on Monday with no additional issues identified. RLWTF personnel are developing corrective actions to improve surveillance tracking.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 19, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending July 19, 2013

Plutonium Facility – Seismic Safety: On Thursday, the field office forwarded the DNFSB letter dated July 17, 2013 on Plutonium Facility seismic safety to LANL for action. The field office memorandum requests LANL support for developing and communicating the schedule for the Plutonium Facility alternate seismic analysis.

Plutonium Facility – Criticality Safety: The Associate Director for Plutonium Science and Manufacturing provided the Laboratory Director with a corrective action plan for criticality safety issues identified at the Plutonium Facility that supersedes the previous action plan (see 6/14/13 weekly) and includes the following:

- Immediate Actions (within 30 days): 1) actions to maintain Plutonium Facility operability and compliance; 2) compensatory actions to ensure operations do not impact criticality controls; and 3) deliberate resumption of operations with minimum potential to challenge criticality controls.
- Short-Term Actions (by the end of September): 1) increase number of certified criticality safety analysts (CSAs); and 2) deliberate resumption of operations with low potential to challenge criticality controls and high programmatic impact.
- Mid-Term Actions (by the end of December): 1) further increase pool of CSAs; 2) deliberate resumption of operations with modest potential to challenge criticality controls and high programmatic impact (e.g. FY 13 deliverables); and 3) identify opportunities for continuous improvement of criticality safety.
- Long-Term Actions (extend beyond 2013): 1) deliberate resumption of additional operations; 2) continue comprehensive operational improvements; and 3) independent evaluation of criticality controls and conduct of operations.

Although the majority of the Plutonium Facility programmatic operations remain paused, the Laboratory Director approved limited resumption of heat source plutonium operations this week. Plutonium Facility personnel also continue to walk-down and evaluate facility operations that are paused. These focused efforts continue to identify criticality safety issues and improvements that are appropriately evaluated and dispositioned.

The field office forwarded the DNFSB letter dated July 15, 2013 on LANL criticality safety to the Laboratory Director for action. The field office memorandum requests LANL action by the end of July 2013 to support response to the Board letter, revise the resumption plan (i.e. the plan detailed above) to addresses identified issues, and provide a resource loaded schedule for resumption activities.

Transuranic Waste Facility (TWF) Project: This week, LANL submitted a revision to the Preliminary Documented Safety Analysis (PDSA) to the field office for approval. The TWF Project will provide enduring LANL capability to stage and characterize transuranic solid wastes and is needed to replace Area G transuranic waste capability. Based on resolution of comments with the field office, the project team revised the PDSA to include a dry pipe fire suppression system and larger vehicle barriers. An Independent Project Review is scheduled for December 2013 to support critical decision-3 in February 2014.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 26, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending July 26, 2013

Staff member L. Lin was on site this week to walkdown LANL defense nuclear facilities.

Plutonium Facility – Criticality Safety: Plutonium Facility personnel identified several criticality safety issues associated with a recent construction activity in the 400 area.

- Work Release – the Associate Director for Plutonium Science and Manufacturing provided guidance on the facility pause that requires Laboratory Director approval to conduct construction activities with the potential to affect the configuration of nuclear materials (see 7/5/13 weekly). The release of this activity was approved by the Facility Operations Director (FOD) as having no potential to affect the configuration of nuclear materials despite the Integrated Work Document (IWD) identifying interface with systems potentially containing 300 gram per liter fissile material solutions. Subsequently, the FOD provided additional guidance on the pause of construction and maintenance activities that could potentially interface with piping and systems that contain fissile material solutions.
- Criticality Safety Evaluation (CSE) – during the critique, facility personnel identified that no CSE was performed for this activity as required by LANL procedures. The IWD for the construction activity was reviewed and approved by the criticality safety group in January 2013; however, the need for completing a CSE was not recognized.
- Criticality Control Implementation – the IWD for this activity required engaging criticality safety for the catch bag design and use of a catch bag with a volume of less than 1 gallon to contain solutions encountered. The actual catch bag being used was approximately 1.4 gallons.

Chemistry and Metallurgy Research Building – Confinement Vessel Disposition (CVD) Project: LANL submitted a corrective action plan for the previously completed CVD contractor Operational Readiness Review (ORR) to the field office for review and approval (see 5/10/13 weekly). The request identified that actions taken to correct the 15 pre-start findings from the contractor ORR have been completed and all other findings have been entered in LANL's performance feedback improvement and tracking system. Actions that must be completed prior to conducting a federal ORR and subsequent startup include: 1) field office approval of a recently submitted safety basis page change; 2) contractor Independent Verification Review of the approved page change; and 3) resolution of technical issues identified by a field office ancillary review (see 6/14/13 weekly). The federal ORR was recently delayed and is now scheduled for September 9, 2013.

Fire Protection: The field office directed LANL to perform a review and develop corrective actions for two recent instances of the Los Alamos Fire Department (LAFD) having difficulty accessing lab facilities to respond to alarms. In one instance, a lightning strike caused a loss of power at the Los Alamos Neutron Science Center which resulted in hot alarms being received by LAFD prompting their response. Upon arrival at the facility, responders were unable to open the access gate due to the loss of power and the absence of manual instructions for opening the gate. In a second instance, a hot alarm was received from a facility in Technical Area-3 that required LAFD response; however, the crew had to wait for the FOD to arrive with the facility keys in order to gain access. The field office has requested the report to be submitted within 14 days.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 2, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending August 2, 2013

Weapons Engineering Tritium Facility (WETF): LANL submitted a proposed safety basis improvement plan for WETF restart activities to the field office for review and concurrence. The plan is designed to support completion of both Contractor and Federal Readiness Assessments in September and October of this year respectively. The letter from the Associate Director for Nuclear and High Hazard Operations that transmitted the plan acknowledges that there are open NNSA comments on the currently submitted but not approved safety basis, but notes that effectively addressing all NNSA issues will delay startup. The letter suggests that the plan balances safety basis improvements versus expediting risk reduction through restart this calendar year. The plan identifies facility activities (repairs, modification, and testing) and proposed safety basis improvements that must be completed prior to facility restart.

The plan commits to develop a Project Execution Plan (PEP) for disposal of legacy waste items that have accumulated in WETF over the years. These items originated from work that has been done in WETF as well as from closure of tritium-capable facilities at LANL and other DOE sites. The disposition of these legacy items is essential to reducing risk in the facility as it represents nearly half of the WETF tritium inventory, and some of these legacy items have leaked tritium in the recent past (see 2/15/13 and 6/7/13 reports). The PEP will identify the strategies, timelines, program management approach, resources, and budget requirements necessary to dispose of the legacy items. LANL has established a multi-disciplined project team comprised of personnel from Operations, Waste Management, and Programs to develop and manage this project.

Area G – Safety Basis: This week, the field office completed a Safety Evaluation Report (SER) and approved the Area G Basis for Interim Operation and associated Technical Safety Requirements. This safety basis, which was submitted in April 2013 and resubmitted in June 2013 to resolve field office comments, is based on a new Hazard Analysis that provides clear linkage to control selection and includes significant reduction in overall Area G material-at-risk inventory limits. The safety basis also addresses issues identified in the Board letter dated November 19, 2012. The field office approval identifies that not all safety basis comments have been adequately resolved and provides six directed actions including the following four actions that require a proposed resolution by October 2013:

- Identify Specific Administrative Controls for Safety Management Programs where risk reduction (i.e. frequency and consequence) is applied in the hazard analysis.
- Remove plume meander from atmospheric dispersion modeling for the fire accident scenarios.
- Use conservative damage ratios for seismic events or provide adequate justification for the damage ratios selected.
- For the forklift propane tank puncture and resulting blowtorch scenario, evaluate the consequences in the accident analysis to appropriately derive required controls.

The other two directed actions involve use of DOE-STD-3009 control selection hierarchy and resolution of additional field office comments by the next annual update. Two members of the NNSA safety basis review team provided minority opinions that did not recommend approval of the Area G safety basis. LANL plans to implement this safety basis at Area G by the end of September 2013.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 9, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending August 9, 2013

Criticality Safety: This week, LANL submitted a revision to its system description SD130, *Nuclear Criticality Program*, to the field office for review and approval. The revision to SD130 has been approved by the Laboratory Director and is aimed at relieving the Nuclear Criticality Safety Group (NCSG) from the burden of having to review procedure changes that are editorial in nature. This will allow LANL's limited NCSG resources to more effectively use their time to perform the numerous criticality safety evaluations and procedure change reviews they have been charged with as a result of procedure walkdowns during the Director's pause in Plutonium Facility operations. The revision also defines what constitutes an editorial change and clarifies that it is the responsibility of the Operations Responsible Manager to ensure procedures impacting criticality safety are reviewed by the NCSG prior to use. Although additional changes to SD130 are planned, this revision was expedited in order to support Plutonium Facility resumption activities.

LANL also submitted its assessment report of 3rd quarter FY13 Nuclear Criticality Safety Program metrics to the field office for review. The assessment aims to measure continuous program improvement, efficient utilization of limited NCSG resources, and alignment of NCSG and Associate Director, Nuclear and High Hazard Operation (ADNHHO) work priorities. The report identified that the criticality safety staff has seen a decrease in their workload during this quarter, but anticipates a large increase in their workload for the 4th quarter as annual process walkdowns come due. Additionally, the assessment concludes that the metrics show an increased alignment of work priorities between ADNHHO and the NCSG.

Plutonium Facility: Plutonium Facility management declared a Potential Inadequacy in the Safety Analysis following a field office assessment of the facility Instrument Air System that identified a less than adequate surveillance procedure. A surveillance performed to ensure the Facility Control System will secure ventilation in certain upset conditions does not perform a complete System Function Test as required by the Technical Safety Requirements.

Chemistry and Metallurgy Research (CMR) Building – Confinement Vessel Disposition (CVD) Project: The field office approved a page change to the CMR safety basis that addresses comments from a field office ancillary review of the CVD project (see 6/14/13 weekly). This approval represents the first of three actions that must be completed prior to commencing a Federal Operational Readiness Review and subsequent startup (see 7/26/13 weekly). The Independent Verification Review of the page change is scheduled to begin August 21, 2013.

Weapons Engineering Tritium Facility (WETF): The field office transmitted a letter to ADNHHO directing action on multiple outstanding WETF recommendations for safety basis changes. The letter identified that safety basis deficiencies are contributing to the inability of WETF to resume operations in order to reduce its legacy tritium inventory and to support its national security mission. The letter directs LANL to resolve safety basis issues identified by the field office and notes that a "step-improvement" in the WETF safety basis is needed to support startup activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 16, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending August 16, 2013

Staff members J. Plaue and R. Tontodonato were onsite this week.

Criticality Safety: This week, LANL submitted a letter requesting relief from previous field office direction on time utilization of qualified Criticality Safety Analysts (CSA). Current field office direction limits CSAs to spending up to 15% of their time working on new or significantly revised Criticality Safety Evaluations (CSE). In addition, work on specific CSEs must be approved by the field office. The remaining 85% of the CSA's time is to be spent supporting emergency response, event response, and field support. The request for relief argues that because of the pause of fissile material operations in the Plutonium Facility, the day-to-day field support by CSAs can be reduced. The CSAs will instead use this additional time to train and qualify newly hired CSAs, and to work on CSEs required to support the resumption of activities in the Plutonium Facility. As such, the letter requests relief from the 15% constraint for working on new or significantly revised CSEs and relief from obtaining field office approval to work on specific CSEs. The CSAs will continue to place priority on emergency/event response and technical support to programmatic operations.

Plutonium Facility personnel continue their process walk-downs to revise and validate procedures and criticality safety-related controls. These walk-downs continue to identify process deviations and criticality safety infractions. This week, facility personnel discovered the arrangement of items in two safes did not match the arrangement as specified by their associated Criticality Safety Limit Approval (CSLA). Additionally, a number of safes were found to have dimensions that did not meet the requirements specified by the CSLA engineered controls.

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL completed a Management Self Assessment this week at RLWTF to evaluate use of the Waste Mitigation Risk Management (WMRM) tanks for influent low-level waste storage and use of a new chemical feed system. The MSA team identified 6 pre-start findings, 10 post-start findings, and 5 observations. Following closure of the pre-start findings, LANL plans to use two of the six 50,000 gallon WMRM tanks for influent low-level waste storage.

The WMRM Project was originally intended to establish 300,000 gallons of low-level liquid waste storage under emergency conditions (e.g. wildland fire conditions); however, the project was halted in 2007 due to significant project management and quality assurance issues. In 2009, LANL completed a tie-in to the low-level waste system and additional actions to allow use of the WMRM tanks to provide 250,000 gallons of emergency storage capacity. Since 2009, facility upgrades have been performed including installation of mixing pumps for the 2 tanks that will be used for influent storage and piping runs to feed the low-level waste processing system from the WMRM tanks. Completion of this project will allow LANL to discontinue use of older single shell tanks that are currently used for influent storage. Other actions are being taken to eliminate use of all single shell tanks and piping.

LANL has also completed the Zero Liquid Discharge (ZLD) Project that provides a natural evaporation capability for RLWTF purified water discharge and eliminates the need for an evaporator. The ZLD capability will be used after approval of a new wastewater discharge permit.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 23, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending August 23, 2013

This week, DNFSB Chairman Peter Winokur, Vice Chairman Jessie Roberson, Member John Mansfield, and Member Sean Sullivan were onsite along with staff members David Jonas, Steven Stokes, and John Pasko to meet with NNSA field office and LANL personnel. The Board had detailed discussions with site personnel on the Plutonium Facility (including the status of the programmatic pause, criticality safety improvements, and seismic safety), the Chemistry and Metallurgy Research Building, Transuranic Waste Operations, the Transuranic Waste Facility Project, the Weapons Engineering Tritium Facility, and emergency preparedness. The Board toured the Plutonium Facility and the Weapons Engineering Tritium Facility.

Nuclear Startup and Readiness Program: This week, the field office transmitted a report of its assessment of the LANL Nuclear Startup and Readiness Program. The assessment was conducted from July 9 – 18, 2013, and evaluated LANL's program against DOE Order 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities*. The assessment team concluded that the LANL Nuclear Startup and Readiness Program is adequately implemented, effective, and sustained. The team identified seventeen observations and the following three findings: 1) the LANL readiness procedure does not require documentation of team member training, experience, qualification, independence, or availability (this is a repeat of a previous finding that was not addressed); 2) lack of a 1 year notification for some startup/restart activities as required by DOE Order 425.1D; and 3) late submittal of a Plan of Action for a startup activity.

Plutonium Facility – Safety Basis: The field office approved a LANL request to extend the due date for re-submittal of the annual revision to the Technical Area-55 Documented Safety Analysis (DSA) and Technical Safety Requirements (TSRs). The revision was initially submitted in September 2012, but the field office directed LANL to revise the DSA and TSRs to incorporate a number of field office generated comments by August 13, 2013 (see 5/17/13 weekly). The request for extension cited the complexity of the necessary changes as well as a number of other issues being addressed by senior safety basis analysts as factors in the delay of the re-submittal.

The Potential Inadequacy in the Safety Analysis that was declared by Plutonium Facility management for an inadequate surveillance of the facility Instrument Air System (see 8/9/13 weekly) has been declared an Unreviewed Safety Question. LANL will submit an Evaluation of the Safety of the Situation for this issue.

Emergency Exercise: On Thursday, LANL conducted an evaluated emergency exercise that simulated a significant release of hydrochloric acid and personnel injuries at the Sanitary Effluent Reclamation Facility due to a malevolent act. The exercise included participation from federal, state, and county representatives. LANL will complete an after action report that evaluates performance and identifies opportunities for improvement.

Transuranic Waste Operations: As part of the 3706 campaign, LANL completed packaging a number of corrugated metal boxes (CMBs) into ten drum overpacks for shipment to the Waste Isolation Pilot Plant. The remaining CMBs require remediation prior to disposition.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 30, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending August 30, 2013

Plutonium Facility – Criticality Safety: In the August 15, 2013, letter to the Board from the Acting Administrator, NNSA committed to complete a causal analysis for recent criticality safety infractions. This week, a LANL causal analysis team held its kickoff meeting. The team consists of laboratory personnel from outside of the Plutonium Facility and is led by the Deputy Associate Director for Chemistry, Life, and Earth Sciences. During the meeting, the team concluded that its first course of action will be to clearly develop the scope of the assessment. The team plans to conduct document reviews, walkdowns of all areas where criticality infractions have occurred, and personnel interviews. The team expects to have the final report completed and briefed to the Laboratory Director by October 4, 2013. NNSA has committed to report the outcome of the causal analysis to the Board in a subsequent status report.

Plutonium Facility – Resumption Status: The Laboratory Director’s pause of fissile material operations at the Plutonium Facility remains in effect. Last week, in accordance with the Associate Director for Plutonium Science and Manufacturing memorandum on resuming operations during the pause, the Laboratory Director was briefed on and approved the release of an integrated work document for preparing small quantity fissile material samples to be tested at Sandia National Laboratory. The work on the sample preparations commenced this week. This activity represents the first programmatic operation (other than activities to achieve and maintain safe and stable facility status) at the Plutonium Facility since the June 27, 2013, pause.

The current highest priority for resumption is to revise, and have the Director approve, 29 Plutonium Facility support processes. These processes control the movement, measurement, disposition, receipt, and shipment of nuclear materials. Although the Director had previously approved limited resumption of heat source Plutonium operations (see 7/19/13 weekly), operations have yet to be performed because these support processes have not yet been approved. The LANL resumption approval process also now requires verification of the seven criteria identified in the NNSA letter to the Board dated August 15, 2013.

Conduct of Operations: LANL recently issued a Conduct of Operations Maturity Plan to improve implementation of DOE Order 422.1, *Conduct of Operations*, at both the facility and institutional level. The plan addresses specific gaps between the order and institutional/facility implementation. In addition, the plan identifies other upgrades and improvements in part based on a review of recent events that involved issues with conduct of operations including: criticality safety implementation at the Plutonium Facility; spread of contamination events at the Los Alamos Neutron Science Center and at the Area G High Energy Real Time Radiography unit; and material control issues at TA-35 Building 27. The plan identifies several focus areas including the following: 1) facility level improvements that can be completed in less than one year; 2) clarification of institutional procedure requirements; 3) improvements in procedure quality; 4) baseline and continuing training; and 5) conduct of operations seminars. As part of this effort, LANL will also be using a new self-assessment tool, “Find-it and Fix-it”, that will support specific evaluation of conduct of operations elements at the facility level.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 6, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending September 6, 2013

Area G – Dome 375 Box Repackaging Line: As part of the campaign to remove 3706 m³ of above ground, non-cemented transuranic waste from Area G, LANL has remediated 25 oversized fiberglass reinforced plywood containers (FRPs) in the Dome 375 box repackaging line since startup of hazard category (HC)-3 operations in June 2013. LANL has been successful at decontaminating most of these containers to low level waste, obviating the need to perform size reduction activities, and thereby decreasing the risk to the workers performing this activity.

Recently completed assays of the remaining oversized FRPs show that two of them exceed the DOE Standard 1027 HC-2 threshold quantities. However, these 2 FRPs do not exceed the HC-2 threshold quantities specified in the NNSA supplemental guidance on DOE Standard 1027. As such, LANL convened a Joint Evaluation Team (JET) to determine whether these 2 FRPs can be remediated as a HC-3 activity, which would allow them to proceed with remediation of the remaining above ground FRPs without having to perform a Federal Readiness Assessment (FRA) as previously planned. The JET voted to submit a request to field office to allow the use of the NNSA supplemental guidance and not to conduct a FRA. The FRPs in question contain large gloveboxes which LANL will also attempt to decontaminate and disposition as low level waste.

Criticality Safety: The Associate Director for Nuclear and High Hazard Operations (ADNHHO) recently divided the previously combined Safety Basis and Criticality Safety divisions, which were managed by one division leader. The reorganization will allow the separate division leaders to focus on improvements in their specific area. Currently, the Deputy ADNHHO is acting as the Criticality Safety division leader until a permanent selection for this position is made.

Chemistry and Metallurgy Research Building - Confinement Vessel Disposition (CVD)

Project: Necessary changes to a Criticality Safety Evaluation (CSE) and implementation of additional criticality controls to support the CVD project have been delayed due to the limited availability of qualified criticality safety analysts. As a result, the ADNHHO has requested a delay in the start of the federal Operational Readiness Review (ORR) that was scheduled to commence next week. The proposed start date for the ORR is now September 30, 2013.

Plutonium Facility – Safety Basis: LANL recently submitted an Evaluation of the Safety of the Situation (ESS) to address facility containers that are not “watertight” as described in the CSE. In March, Plutonium Facility personnel questioned whether the vents associated with material containers were watertight as required by the Criticality Safety Limit Approval. This issue was declared a Potential Inadequacy of the Safety Analysis and subsequently determined to be an Unreviewed Safety Question. LANL conducted testing to evaluate water intrusion into containers during flooding and determined that only a small amount of water leaked into two of the fourteen container types tested. The small amount of water in-leakage was determined to be consistent with the assumptions in the CSE. The ESS commits to revising the CSE to address the small volume of water in-leakage and to revise the Documented Safety Analysis to appropriately evaluate flooding scenarios.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 13, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director

FROM: R.T. Davis and R.K. Verhaagen

SUBJECT: Los Alamos Report for Week Ending September 13, 2013

Criticality Safety: LANL continues to work on resumption activities for the paused fissile material operations in the Plutonium Facility. A war-room has been set up to manage and track the resumption activities, and a senior LANL manager has been temporarily assigned to manage this effort. The resumption process continues to evolve, and as such, a revision to the Notice, *Resumption Release Process for Programmatic Activities at PF-4*, was recently issued. This notice was released to update the requirements for the resumption process and to identify compensatory actions being taken to address material management issues.

During reviews of objective evidence packages for resumption of programmatic operations, the site reps identified multiple issues with the proposed procedures, Criticality Safety Evaluations (CSE), and Criticality Safety Limit Approvals (CSLA). These issues included: 1) a procedure did not specify any criticality controls and did not reference the CSLA; 2) a CSE and its associated CSLA specified different controls; and 3) a CSLA was developed without an evaluation. Additionally, recent assessments and reviews have identified issues with the quality of existing CSEs. All of these issues are being addressed and the resumption process is being refined to ensure evaluations are of sufficient quality and that the controls from the CSEs adequately flow down into the CSLAs, postings, and procedures.

Area G – Safety Basis: Area G personnel are scheduled to implement the new Basis for Interim Operation and associated Technical Safety Requirements (TSRs) by the end of this month. As part of the implementation, inventory tracking was recently transitioned from a locally maintained database to the LANL Waste Compliance and Tracking System. This system will be used to perform material at risk surveillances as required by the TSRs. Area G personnel have completed training on the new safety basis. Field implementation of defined areas, liquid berms, and markings has also been completed in accordance with the TSRs. LANL will perform an Implementation Verification Review prior to declaring the new safety basis implemented. Area G management will review and release individual work activities following safety basis implementation.

Plutonium Facility – Safety Basis: LANL recently submitted an Evaluation of the Safety of the Situation (ESS) to address General Purpose Heat Source (GPHS) items that were found to be bulging. In April, Plutonium Facility workers identified two bulging GPHS items and subsequently identified five additional bulging items. The encapsulated GPHS items are credited in the safety basis as safety-class (damage ratio of zero) for heat source-plutonium. When discovered, facility management declared the safety-class feature inoperable and fully counted the materials against facility material at risk limits (damage ratio of one). LANL subsequently concluded the issue represented an Unreviewed Safety Question. LANL testing and evaluation referenced in the ESS concludes that the bulging is likely caused by helium release during storage and will not result in rupture of the items. The ESS also identifies compensatory measures to 1) continue to apply a damage ratio of one for degraded GPHS items, 2) use safety class containers to overpack these items when outside a glovebox, and 3) store no more than two GPHS items together. Additional testing and analysis is planned to better characterize the bulging mechanism.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 20, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director

FROM: R.T. Davis and R.K. Verhaagen

SUBJECT: Los Alamos Report for Week Ending September 20, 2013

The site representatives were out of the office this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 27, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director

FROM: R.T. Davis and R.K. Verhaagen

SUBJECT: Los Alamos Report for Week Ending September 27, 2013

Chemistry and Metallurgy Research Building (CMR) – Confinement Vessel Disposition (CVD)

Project: This week, the CMR Facility Operations Director declared readiness to proceed with the CVD Federal Operational Readiness Review (ORR). This declaration identified that all necessary findings from the previously conducted Management Self Assessment and Contractor ORR have been closed. Additionally, directed changes to the Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR) to address field office comments from an ancillary review have been completed and their implementation verified.

Due to the current field office management structure, the DOE/NNSA Central Technical Authority has been designated the Startup Authorization Authority (SAA) for this activity. The field office has approved and forwarded the request recommending approval to the SAA. Pending this final approval, the Federal ORR is scheduled to commence September 30, 2013.

Plutonium Facility – Safety Basis: The Potential Inadequacy in the Safety Analysis that was declared for the Plutonium Facility Control System/Ventilation System Function Test (see 8/9/13 weekly) resulted in an Unreviewed Safety Question. LANL submitted an Evaluation of the Safety of the Situation (ESS) to the field office this week for review and approval. The ESS concludes that no compensatory measures or operational restrictions are necessary and commits to revise the DSA and TSRs to clarify the appropriate safety function. Additionally, the test procedure in question will be revised to be consistent with the TSRs.

Weapons Engineering Tritium Facility (WETF): This week, LANL submitted a revision to the WETF DSA, TSRs, and Fire Hazards Analysis to the field office for approval. The field office and LANL personnel have conducted multiple workshops to resolve previous comments and identify specific safety basis changes needed to support near term facility restart. Approval of this safety basis change supports closure of Potential Inadequacy in the Safety Analysis issues associated with the oxygen monitoring system, hot-inlet system, and Radioactive Control Safety Management Program. Following field office approval and implementation of the revised safety basis, a contractor and federal readiness assessment are scheduled. Restart of this facility is needed to support disposition of excess tritium inventory and legacy items and to allow completion of function test programmatic missions.

Plutonium Facility – Seismic/Structural: The field office recently approved changes to the Fiscal Year 2013 Performance Evaluation Plan scope associated with Plutonium Facility seismic and structural activities. Specific Technical Area 55 Reinvestment Project scope that has been delayed was replaced with the following tasks: 1) remove 1.9 kg of heat-source plutonium (HS-Pu) from the laboratory floor; 2) dismantle and reprocess 1.8 kg of HS-Pu from rejected fuel clads (completion depends on resumption of associated programmatic operations); 3) analyze building performance against the requirements in DOE-STD 1020-2012; 4) design and install anchorage for two electrical panels; 5) initiate anchorage upgrades for two unit substations; and 6) add loss of 130 VDC power indication associated with the safety-class seismic switches to the Facility Control System.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 4, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending October 4, 2013

Staff member J. Pasko was onsite this week to observe the Federal Operational Readiness Review of the Confinement Vessel Disposition Project in the Chemistry and Metallurgy Research Building.

Fire Protection: On September 27, 2013, Los Alamos County approved a new 10 year cooperative agreement with NNSA to provide fire department and other services to LANL. The cooperative agreement continues to ensure that the Los Alamos Fire Department (LAFD) is trained and prepared to provide fire and emergency response to LANL facilities. The new agreement also includes establishment of a LAFD Hazmat Team along with response expectations.

Area G – Safety Basis: As directed by the field office, Area G personnel implemented the approved Basis for Interim Operation (BIO) and associated Technical Safety Requirements (TSR) on September 30, 2013 (see 8/2/13 weekly). Following implementation of the BIO and TSRs, Area G management methodically reviewed and approved release of individual Area G operations. All activities have been restarted and operations to continue the removal of 3706 m³ of above ground, non-cemented transuranic waste have resumed. Area G personnel also reported that the 3706 campaign goals for FY13 have been met.

Weapons Engineering Tritium Facility (WETF): The Deputy Associate Director for Weapon Engineering and Experiments transmitted a letter to the field office updating the status of the tritium-containing materials disposition effort (see 8/2/13 weekly). The letter identifies that an integrated project team has been assembled to develop a project plan to evaluate legacy assets to determine items that have programmatic utility and items that can be processed and dispositioned as waste. The letter also identifies activities intended to be completed in calendar year 2014 to include: 1) complete item inventory and define solution packages; 2) develop processing and disposition paths; 3) execute “simple” solution package disposition; 4) establish processes and procure material necessary for bulk gas storage and shipment of non-essential bulk gas; and 5) identify materials, supplies, processes, and safety basis changes necessary to support out-year legacy-item processing and disposal. This effort is necessary to disposition more than 750 tritium containing items that have accumulated in WETF over the years.

Plutonium Facility – Safety Basis: LANL recently submitted a revision of the 2011 Technical Area-55 (TA-55) Documented Safety Analysis and TSRs to the field office for approval. The safety basis revision addresses preparation and assay of transuranic waste outside of the Plutonium Facility but inside the TA-55 protected area. LANL recently completed installation of a high efficiency neutron counter (HENC) on the safe secure transport pad, which is now referred to as the HENC pad, in support of this activity. The major changes in the proposed safety basis revision include: 1) increased material at risk (MAR) limits for the waste pad; 2) a new MAR limit for the HENC pad; 3) classifying pipe overpack containers as safety class; 4) classifying safes on the HENC pad as safety significant; and 5) a new specific administrative control to exclude refueling around the HENC pad. The change is also intended to resolve a Potential Inadequacy of the Safety Analysis identified in March 2012 associated with refueling activities (see 3/16/12 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 11, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending October 11, 2013

Because of the ongoing lapse in federal appropriations, NNSA has directed LANL to prepare for the orderly closure of all site operations except for activities required to maintain facilities in a minimum safe state. This state includes compliance with safety basis requirements for nuclear facilities (e.g. performance of Technical Safety Requirement surveillances and minimum staffing). Without a resolution to the appropriations, LANL will transition to this closure mode for all operations at the close of business on October 18, 2013. LANL is identifying essential personnel to maintain a safe shutdown mode along with a resumption team that will focus on plans to safely restart operations following the shutdown. The Field Office is also identifying a small number of excepted personnel.

Los Alamos Field Office: Ike White reported for duty this week to be the acting field office manager for the next 60 days. Mr. White replaces Geoffrey Beausoleil who had been acting in this position pending selection of a new manager.

Confinement Vessel Disposition (CVD) Project: This week, the Federal Operational Readiness Review (ORR) for the CVD Project in the Chemistry and Metallurgy Research Building (CMR) concluded. The Federal ORR team identified 29 pre-start and 25 post-start findings. Despite the large number of findings, the ORR team cautioned against over emphasizing the numbers, as they concluded the issues were generally discrete with clear paths to closure. Operations, criticality safety, and engineering were identified as subject areas with the greatest opportunities for improvement. Following adequate closure of the pre-start findings and the development of a corrective action plan for closure of the post-start findings the team concludes that CVD nuclear activities can be safely conducted in CMR.

Plutonium Facility – Criticality Safety: Plutonium Facility management approved a major revision to the Technical Administrative Procedure, *TA55 Nuclear Criticality Safety Program*. This procedure identifies the Roles, Responsibilities, Authorities, and Accountability requirements for the development, implementation, revision, and periodic review of new and existing criticality limits. Changes were made to address issues raised in the Board's July 15, 2013, letter that identified significant non-compliances with applicable DOE requirements and industry standards in the implementation of LANL's criticality safety program. Specific to the Board's issues, the revision clarifies expectations for implementation of criticality controls in procedures, procedure use categories, and material labeling.

Safety Basis: NNSA recently completed an assessment of the LANL safety basis program and provided initial feedback to laboratory management. The assessment identified the following seven findings: 1) lack of an effective process to ensure safety basis documents are reviewed prior to submittal; 2) ineffective process to ensure safety basis deliverables meet NNSA expectations; 3) lack of an effective comment resolution process; 4) inadequate process to implement DOE-STD-1189 in addressing NNSA comments for LANL projects; 5) internal assessments not performed per LANL procedures; 6) inadequate formal process for implementation of new or revised safety basis documents; and 7) cancellation of a safety basis procedure that did not meet LANL requirements.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 18, 2013

MEMORANDUM FOR: S.A. Stokes, Acting Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending October 18, 2013

Based on the temporary resolution of federal appropriations, the Laboratory Director cancelled the planned suspension of operations that was scheduled to occur on Friday. All LANS employees are expected to report to work as normal. As some LANL operations had already been impacted, the Director emphasized that the resumption of activities should be performed in a methodical and deliberate manner. In the last few weeks, considerable site effort has been focused on the planning and execution of a safe laboratory shutdown. NNSA has communicated to LANL that these plans be finalized over the next few weeks for potential use in the future.

Transuranic Solid Waste Operations: Environmental and Waste Management Operations (EWMO) including Area G, the WCRR repackaging facility, and the RANT shipping facility were placed into a safe shutdown mode last week due to lack of funding. This included suspension of most LANL subcontract work in these areas. EWMO management has developed a resumption plan that will be implemented next week to bring subcontractors back onsite and conduct a deliberate release of programmatic work to support completion of the 3706 campaign.

Plutonium Facility – Safety Basis: Last week, LANL requested an extension for two Evaluations of the Safety of the Situation (ESS) for refueling activities (see 3/16/12 weekly) and ammonium nitrate in the exhaust ventilation (see 7/23/10 weekly). These ESSs were intended to be closed during the 2012 safety basis annual update; however, the safety basis was never approved. These issues are also addressed in the most recent annual update that was submitted in September.

As noted above, LANL submitted the 2013 annual update for the Plutonium Facility last month. The major changes in this safety basis include the following: 1) incorporation of most field office comments from the 2012 annual update; 2) inclusion of additional transuranic waste activities (see 10/4/13 weekly); 3) changes to support closure of ESSs (including two mentioned above) and Potential Inadequacies of the Safety Analysis; 4) resolution of comments in the 2011 Safety Evaluation Report; and 5) re-evaluation of the leak path factor for the seismic accident scenario. The field office is currently reviewing the revised safety basis.

Area G – Safety Basis: There are approximately 25 unvented drums containing transuranic waste in Area G that cannot be processed by the existing drum venting system (DVS) because they are either too large or exceed the DVS weight limit. The Area G safety basis currently prohibits opening unvented drums due to the potential for hydrogen buildup and deflagration. In order to process these drums, Area G personnel submitted a temporary safety basis modification request to the field office for review and approval. The safety basis modification would allow workers to remove potentially unvented 55 gallon drums nested in potentially unvented 85 gallon drum overpacks nested in 110 gallon unvented drum overpacks. In its response, the field office noted that the proposed activity does not have the capability to attach a lid restraint onto the nested 55 gallon drum or the nested 85 gallon overpack and could thereby expose the worker to potential injury from a postulated lid ejection scenario. The field office provided LANL with additional comments and direction to revise and resubmit the safety basis for approval before it will allow this activity.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 25, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending October 25, 2013

Transuranic Waste Operations: Operations at Area G, the WCRR repackaging facility, and the RANT shipping facility resumed this week including shipments to WIPP.

Criticality Safety: In an effort to complete a ranking of fissile material operations (FMOs) across the site based on risk from a criticality safety perspective, LANL submitted a list of what it considers low risk FMOs to the field office for concurrence. The list of low risk FMOs was developed using criteria that provides a high level of confidence that adequate controls are in place to prevent a criticality. The list includes nearly half of the FMOs at the site, and all of the FMOs outside of the Plutonium Facility. As directed by the field office, this risk ranking represents a shift from a previous effort (see 3/19/13 weekly) that ranked FMOs primarily by the confidence level in the technical basis for the criticality safety evaluation. LANL has committed to risk rank the remaining Plutonium Facility FMOs in a future submittal. This risk ranking effort will be used to assist in identifying lower risk FMOs within the Plutonium Facility that will be the first to be resumed.

The Nuclear Criticality Safety Division Leader recently issued a memorandum communicating expectations regarding performance demonstrations for newly qualified criticality safety analysts (CSAs). These performance demonstrations are designed to evaluate newly qualified CSA's quality of work and to ensure a high performance standard. Newly qualified CSAs will be required to perform procedure reviews, criticality safety evaluations, annual process reviews, and event response under review of Nuclear Criticality Safety Division leadership until they have adequately demonstrated competency in these areas.

Plutonium Facility – Safety Basis: This week, the field office approved the Evaluation of the Safety of the Situation (ESS) associated with General Purpose Heat Source (GPHS) items that were found to be bulging (see 9/13/13 weekly). The ESS proposed compensatory measures to apply a damage ratio of one to these items, overpack in safety class containers when outside of a glovebox, and store no more than two GPHS items together. The field office did not identify any conditions of approval. Initial investigation appears to indicate that the bulging is caused by internal pressure; however, LANL continues to investigate the issue.

Safety Basis: Earlier this year, LANL developed and submitted a draft of the *Safety Basis Division Technical Bulletin Guidance on the Identification of Other Equipment Important to Safety (OEITS)*. This guidance was developed to comply with DOE Order 420.1B requirements for the identification of systems that perform important defense-in-depth functions. The guidance also identifies how these systems will be managed through facility safety management programs (e.g. engineering, quality assurance). Earlier this month, the field office concurred with this guidance and directed LANL to formally issue the document within 45 days along with an implementation plan. The first phase of the implementation plan will include identification of an initial list of OEITS by January 17, 2014, based on information available in facility safety basis documents and line management judgment. Facility safety basis documents will also be upgraded during the annual updates to comply with the OEITS guidance and refine the list of defense-in-depth systems.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 1, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis and R.K. Verhaagen
SUBJECT: Los Alamos Report for Week Ending November 1, 2013

The Laboratory Director announced that Cheryl Cabbil has been selected to take over as the LANL Associate Director for Nuclear and High Hazard Operations on December 2, 2013. Ms. Cabbil was previously the vice president for Environment, Safety, Health, and Quality Assurance for URS/CH2M Oak Ridge, LLC.

Material Recycle and Recovery (MR&R): The LANL MR&R program is focused on the disposition and management of nuclear materials to meet programmatic needs (including risk reduction activities) and support strategic plans for enduring national missions. In Fiscal Year (FY) 2013, LANL received additional funding to support an accelerated nuclear material disposition project that includes disposal of 1.4 metric tons of nuclear material with “no defined use” by 2018. As part of this project, accelerated vault recovery eliminates legacy vault materials and will provide greater operational flexibility for future laboratory missions. In FY 2013, the LANL MR&R program completed the following accelerated vault recovery items: 1) removal of all non-standard containers from one vault room to allow access without respirator protection; 2) identification of vault items categorized into appropriate disposition campaign categories (includes more than 7000 items); 3) stabilization/disposition of 400 kg Pu-239 equivalent; and 4) disposition of 234 containers. In addition, the MR&R program completed installation of the High Energy Neutron Counter at Technical Area-55 to support transuranic waste disposition.

Area G – Safety Basis: This week, LANL submitted two safety basis addendums for the currently implemented Area G Basis for Interim Operations to the field office for review and approval. The first addendum will allow operators to open sealed inner containers with bolted lids/flanges during Sort, Segregate, Size-Reduction, and Repackaging activities. The addendum for this activity identifies additional specific administrative controls to reduce the likelihood and consequence of a deflagration that include: 1) ceasing spark-producing activities prior to loosening the lid/flange bolts; 2) the use of non-sparking processes and tools; 3) ensuring the workers and drums are grounded/bonded; and 4) loosening lid/flange bolts sufficiently to break the seal allowing the drum to vent without completely removing the bolts. The second addendum will allow gas generation testing (GGT) of a small number of transuranic waste drums to ensure they meet shipping requirements. This addendum credits an existing specific administrative control to ensure that drums processed through GGT have less than 200 PE-Ci.

Confinement Vessel Disposition (CVD) Project: On Wednesday, the field office transmitted the final CVD Operational Readiness Review (ORR) report to LANL for action. In addition to a corrective action plan for the identified findings, the field office requested the following: 1) the list and qualifications of personnel designated as senior supervisory watch; 2) LANL approach to ensure adequate formality of operations and approach for rigorous closure of pre-start findings; 3) LANL actions to ensure and verify sustained performance for formality of operations and criticality safety; and 4) effectiveness evaluation for actions identified in the LANL Continuous Improvement Plan for Conduct of Operations based on the weaknesses identified in the ORR report. The field office also requested LANL to identify lessons learned for application to future readiness activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 8, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 8, 2013

DNFSB Staff Activity: Dr. J. Plaue reported for Site Representative duty on Monday. Staff members R. Arnold and B. Laake were on site to review documentation associated with the technical basis for the W76 weapons response summary document. The staff and site reps also participated in a multi-site video-teleconference concerning implementation of Issue H of the weapons response summary document and falling man hazards at the Pantex Plant.

RANT Shipping Facility – TRUPACT III Loading Enclosure (TTLE): LANL submitted a Safety Basis Strategy for construction of a TTLE at the RANT shipping facility. The TTLE will provide facility personnel a location to load Waste Isolation Pilot Plant (WIPP) - Waste Acceptance Criteria compliant standard large box 2 (SLB2) shipping packages into TRUPACT III Type B containers using a 40 ton bridge crane. The TTLE will be a large Quonset hut type building with the primary function of providing weather protection for TRUPACT III loading operations, which require temperatures to remain above 40° F. The SLB2 is a large shipping container with an equivalent volume of approximately thirty-five 55-gallon drums. As such, the SLB2 provides the capability to ship large intact items, such as gloveboxes, directly to WIPP without having to conduct size reduction activities, significantly reducing risk to the workers and public. The submission of the Safety Basis Strategy includes a preliminary hazards evaluation and a completed questionnaire from Appendix J of DOE-STD-1189 to conclude that construction of the TTLE does not constitute a major modification of the RANT shipping facility.

Weapons Engineering Tritium Facility (WETF): Recently, WETF personnel identified that the Integrated Work Documents (IWDs) that cover radiological control technician (RCT) work (e.g. surveys, monitoring, radiological equipment use and maintenance) were not evaluated by the Unreviewed Safety Question (USQ) process as required by the safety basis. Facility personnel identified corrective actions during a critique on Tuesday that included: 1) ensuring all IWDs and procedures used by RCTs are evaluated under the USQ process; 2) identifying other support organization procedures used at WETF; 3) verifying these support organization procedures are evaluated under the USQ process; 4) evaluating improvements to the WETF work control procedure; and 5) defining the process for authorizing work for support organizations.

LANL management also identified the need to perform an extent of condition review at other nuclear facilities. Based on an initial review, some support organization IWDs and procedures at other nuclear facilities do not receive a USQ evaluation. In addition, there is no systematic institutional process to ensure these procedures are properly evaluated. A LANL team is reviewing this problem to determine appropriate site-wide corrective actions and will recommend changes to institutional procedures.

Electrical Safety: On Wednesday, the LANL Chief Electrical Safety Officer provided the field office with an overview of three recent electrical safety issues that occurred in October. Recommendations and improvements for each of the individual events were identified. In addition, broader lessons learned will be communicated across the laboratory.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 15, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 15, 2013

DNFSB Staff Activity: On Wednesday, the site representatives and staff members D. Kupferer and J. McComb participated in a video teleconference arranged by the field office to provide the status on resumption activities associated with criticality safety and conduct of operations at the Plutonium Facility.

Criticality Safety: Last week, the field office concurred with minor changes to the listing of fissile material operations (FMO) the contractor determined to have high confidence of low criticality risk (see 10/25/13 weekly). The field office added one FMO associated with plutonium-238 operations and removed two FMOs associated with plutonium chloride operations from the list. Overall, the approved list contains 228 FMOs, including all FMOs performed outside of PF-4. Within PF-4, the list includes all FMOs involving plutonium-238, operations within the basement, and certain other FMOs assessed as low risk (e.g., ≤ 520 g metal or involving essentially all plutonium oxide). The contractor expects to resume these low risk FMOs on a schedule currently in development.

Safety Basis: On November 8, 2013, the field office transmitted the results of an NNSA assessment of LANL's safety basis program (see 10/11/13 weekly). The transmittal stated that "as evident by PF-4 safety basis deliverables last year, progress has been made, but further improvement is needed, particularly in disseminating and applying lessons learned from each safety basis review to subsequent submittals." The assessment team identified that significant improvements in development, maintenance, and sustainability of safety basis documentation are needed and concluded that LANL safety basis program continues to struggle with quality and consistency of safety basis document submittals. As a result, the field office has directed LANL to: 1) self-evaluate the safety basis program; 2) determine causal factors for the findings identified in the assessment; and 3) incorporate necessary corrective actions into a resource-loaded safety basis improvement plan with milestones to be completed in fiscal year 2014.

Plutonium Facility – Safety Basis: The field office recently transmitted comments to LANL regarding a submittal of the evaluation of the safety of the situation (ESS) addressing Plutonium Facility containers that are not "watertight" as described in the criticality safety evaluation (see 9/6/13 weekly). The field office noted that the ESS is considered incomplete due to an inadequate technical justification, but agreed that there is no immediate safety concern. LANL has been directed to resolve field office comments and resubmit the ESS by December 8, 2013.

Radiochemistry Laboratory (RC-1): The field office approved a LANL request to incorporate derived hazard category-3 threshold quantities calculated for 46 radionuclides to be used in RC-1, which is a radiological facility. The field office previously approved the use of NA-1 SD G 1027, *Guidance on Using Release Fraction and Modern Dosimetric Information Consistently with DOE STD 1027-92* for RC-1 (see 9/14/12 weekly). These particular radionuclides are not identified in the guidance and as such their threshold quantities had to be derived using the methodology approved in the supplemental guidance.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 22, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending November 22, 2013

DNFSB Staff Activity: On Thursday, the Site Representatives and staff members B. Caleca, A. Hadjian, and J. Pasko held a teleconference with field office and laboratory personnel. The purpose of the teleconference was to obtain the status of efforts to analyze and upgrade safety-related systems and components (including planned upgrades for the fire suppression and confinement systems) in the Plutonium Facility consistent with the latest probabilistic seismic hazard analysis.

Governance: Three members of the *Congressional Panel on the Governance of the Nuclear Security Enterprise* visited the laboratory. The members met with the field office, laboratory management, the New Mexico Environment Department, and the Site Representatives to discuss the current NNSA governance approach, issues, and potential improvements.

Criticality Safety: This week, laboratory management briefed the field office on the resumption status in the Plutonium Facility following the Laboratory Director's pause of programmatic activities to improve performance in conduct of operations and criticality safety. The laboratory's resumption process prioritizes activities by mission importance and criticality safety risk; plutonium-238 operations and general plant procedures have been the early focus. To date, the Director has released approximately 60 operational procedures. However, LANL has been unable to resume many of these activities due to dependence on other procedures that have yet to be approved. Laboratory management noted that approximately 300 procedures require approval to accomplish the programmatic activities planned for fiscal year 2014.

In addition to the 60 procedures previously approved, this week the Director delegated authority to resume fissile material operations (FMO) involving ≤ 520 g. Currently, 46 FMOs have a material limit of ≤ 520 g of plutonium. Plutonium Facility personnel are also in the process of evaluating individual FMOs to determine the minimum amount of material required for the operation. Laboratory management expects this effort to reduce the fissile mass analyzed in the associated criticality safety evaluations (CSE) and may result in additional FMOs with ≤ 520 g. The Site Representatives note that a further benefit of this effort may be the reduction of the actual material-at-risk (MAR) present in the lab rooms and improved fidelity on the MAR required to be supported in future safety basis updates.

Confinement Vessel Disposition (CVD) Project: Chemistry and Metallurgy Research (CMR) Building personnel continue to work on corrective actions associated with the CVD Operational Readiness Review (ORR). LANL completed a causal analysis for the ORR findings and expects to transmit a comprehensive corrective action plan to the field office in the next few weeks. To help address actions identified in the field office letter transmitting the ORR report (see 11/1/13 weekly), laboratory management identified primary and secondary senior supervisory watch personnel that will initially focus on achieving sustained performance improvements in formality of operations and criticality safety. Laboratory management is also communicating lessons learned from the CVD ORR to other facilities at the laboratory.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 29, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 29, 2013

DNFSB Activity: On Tuesday, NNSA personnel briefed the Board on the results of the Operational Readiness Review for the Confinement Vessel Disposition Project and the path forward to commencing nuclear operations.

Weapons Engineering Tritium Facility (WETF): On Monday, WETF management declared a Potential Inadequacy of the Safety Analysis (PISA) regarding the as-found calibration check results for the Oxygen Monitoring System (OMS). The approved safety basis credits the OMS with a safety significant function to provide an early warning so operators can take action to prevent the formation of a deflagrable mixture in tritium gloveboxes and certain processing systems. Per the Technical Safety Requirements (TSR), facility personnel perform a semi-annual surveillance on the OMS oxygen sensors that includes an as-found calibration check, sensor replacement, and an as-left calibration. During the October surveillance, facility personnel determined 6 of 12 sensors failed the as-found calibration check in the non-conservative direction (i.e., readings were lower than expected). Subsequent to a written observation by the field office Facility Representative noting these failures and questioning the adequacy of the surveillance frequency, WETF management conducted a critique, determined the OMS was inoperable, and concluded that a PISA existed.

WETF management placed the facility in a safe condition per the TSR and plan to propose a more frequent surveillance interval to obtain improved data and understanding on sensor drifting as part of their evaluation of the safety of the situation. Facility personnel also plan to conduct the surveillance in the near-term to provide drift data near the one month point. The Site Representatives note the following additional pertinent information: 1) the sensor manufacturer recommends a calibration check every 2–4 weeks, and 2) operators must breach the glovebox confinement to access the oxygen sensors for calibration and replacement due to the design of the existing OMS. Facility personnel have initiated a design change package to upgrade the OMS electronics, but have not pursued changes to relocate the sensors to outside of the tritium-contaminated glovebox environment.

Area G – Safety Basis: The field office disapproved LANL's submittal of the two safety basis addendums for the Area G Basis for Interim Operations (BIO) (see 11/1/13 weekly). The addendums would have allowed operators to open sealed inner containers with bolted lids/flanges during Sort, Segregate, Size-Reduction, and Repackaging activities, and to perform Gas Generation Testing under a stand-alone safety basis. The field office directed LANL to resubmit the addendums as page changes incorporated into the existing BIO and TSR.

Plutonium Facility – Safety Basis: Last week, the field office transmitted comments to LANL on a recent safety basis update (see 10/18/13 weekly). A majority of the comments related to the new transuranic waste preparation and assay activities to be performed outside of the Plutonium Facility structure, but inside the TA-55 protected area. The field office directed LANL to resubmit the revision and a consolidated comment resolution document in a timely manner to support programmatic needs.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 6, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 6, 2013

DNFSB Activity: Staff members Z. Beauvais, J. McComb, and R. Verhaagen attended a course on criticality safety conducted at LANL this week.

LANL Management: On Monday, Cheryl Cabbil assumed the role of Associate Director for Nuclear and High Hazard Operations.

Plutonium Facility – Criticality Safety: LANL recently submitted a report providing status and the path forward to the field office on the Plutonium Facility programmatic pause. The path forward includes two improvement plans: one focused on the institutional criticality safety program; and the second on Plutonium Facility conduct of operations and criticality safety improvements. The path forward identifies high-level areas for improvement; however, many key details and decisions that are needed to drive resolution of identified deficiencies have yet to be determined.

NNSA Oversight: Last month, the field office and laboratory jointly approved the Strategic Performance Evaluation Plan (SPEP) for fiscal year 2014. NNSA's approach for this SPEP is similar to last year with five performance objectives each supported by several broad contributing factors uniformly applied for all NNSA sites. These objectives are supplemented with a limited number of site-specific outcomes, including the following LANL outcomes of interest:

- Develop the plutonium strategy for the complex and advance recapitalization and modernization of the plutonium infrastructure at LANL.
- Implement revised plutonium disposition program goals and objectives for the complex; complete plutonium oxide production requirements at LANL; and achieve surplus fissile material program objectives.
- Demonstrate measurable improvements/maturation in the LANL safety culture; improve Nuclear and High Hazard Operations safety performance in areas including, but not limited to, formality of operations and safety basis implementation. Complete implementation of corrective actions to ensure long-term viability of the LANL criticality safety program.

Similar to last year, NNSA Headquarters management prohibited the development of additional criteria or metrics to assist in the objective evaluation of performance against the SPEP.

Weapons Engineering Tritium Facility (WETF): This week, the field office completed a Safety Evaluation Report (SER) that approves a revision to the WETF safety basis. The approval letter states that the proposed revision “constitutes an interim [safety basis] revision sufficient to enable restart of the WETF with the interim goal of inventory reduction of legacy radioactive material at risk.” Accordingly, the SER includes a condition of approval that limits the scope of programmatic operations after startup to legacy material disposition only. The current WETF safety basis has been revised numerous times but relies on a hazard and accident analysis approved in 2002. A new safety basis has been submitted and the field office has provided many comments; however, this document has not been approved (see 5/3/13 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 13, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending December 13, 2013

DNFSB Staff Activity: On Thursday, the staff conducted a teleconference with laboratory and field office personnel. The teleconference covered the status of actions taken in response to concerns with the safety basis for Area G described in a letter from the Board dated November 19, 2012.

Plutonium Facility–Criticality Safety: This week, a team of operations and criticality safety personnel visited Lawrence Livermore National Laboratory to benchmark best practices for a number of open issues (e.g., container labeling and postings). R. T. Davis observed the visit. Next week, the team will travel to the Y-12 National Security Complex for a similar visit.

On Wednesday, PF-4 personnel conducted a critique for a process deviation involving the presence of a geometrically unfavorable vessel (an inverted work/step platform) located in an aqueous plutonium processing room. An observer identified the platform during a tour conducted as part of last week's criticality safety course. The observer notified a facility criticality analyst; however, no actions were taken. The observer later notified the NNSA instructor who in turn notified the field office. The next day, field office personnel walked-down the location, identified the deviation, and notified the Operations Center. During the critique, PF-4 personnel determined the following key corrective actions: (1) perform an extent-of-condition review of the facility to identify other geometrically unfavorable portable vessels, (2) establish a systematic method to control such vessels in the facility, and (3) revise training to reinforce the expectation to notify the Operations Center for any potential anomalous condition.

Plutonium Facility–Seismic Safety: This week, PF-4 personnel began wrapping the captured columns with a fiber-reinforced polymer to improve the structural performance during a seismic event. LANL identified these columns, along with the roof girders, as deficient during the 2012 static non-linear seismic analysis. PF-4 personnel plan to complete the captured column upgrade in early-2014. Upgrade design for the roof girders, including peer review, is ongoing with plans to begin these upgrades in 2014. NNSA also continues to pursue the alternate static non-linear seismic analysis that may identify the need for additional facility upgrades.

Area G–Safety Basis: LANL recently responded to four field office directed actions that were captured in the Safety Evaluation Report (SER) that approved the Area G Basis for Interim Operation (BIO) in August 2013 (see 08/2/13 weekly). During the next BIO revision, LANL committed to eliminate risk reduction credit for safety management programs and instead identify appropriate specific administrative controls or safety structures, systems, and components. LANL also requested a delay of the next BIO submittal from February 2014 to March 2014.

RANT Shipping Facility–TRUPACT III Loading Enclosure (TTLE): Last week, the field office responded to the LANL's safety basis strategy and concluded that the TTLE represented a major modification per DOE-STD-1189 (see 11/8/13 weekly). The field office directed submittal of a preliminary documented safety analysis and a tailoring strategy for DOE-STD-1189. The field office also requested changes to institutional procedures to ensure an early formal determination for major modifications that is readily visible to federal oversight.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 20, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending December 20, 2013

Weapons Engineering Tritium Facility (WETF): This week, facility management announced the completion of the inventory of legacy tritium-containing items. This is an important first step in their effort to disposition tritium-containing items (see 10/4/13 weekly). Facility personnel continue to work on required restart activities including procedure finalization and operator training. Facility restart is necessary to disposition many of the tritium-containing items through the Tritium Gas Handling System. LANL has scheduled restart activities, including a management self-assessment, contractor readiness assessment, and a federal readiness assessment for early calendar year 2014.

Following a series of self-identified issues with work control, the WETF Facility Operations Director called for a safety pause on Wednesday morning. The issues were related to procedural compliance by both facility and non-facility contractor personnel. In one instance, a wall penetration was being performed without a prior ground penetrating radar scan as required by the work package. In another instance, workers completed steps of a preventive maintenance instruction without using a specified tool.

This week, the field office also provided direction to LANL regarding pressure safety issues that were identified during a safety system oversight review (see 4/26/13 weekly). The direction letter noted that many LANL approved variances for WETF safety significant systems may not be compliant with pressure safety requirements of ASME B31.3, *Process Piping*. As a result, LANL is directed to submit to the field office a list of variances that cannot be otherwise closed and will require DOE approval for either an equivalency or exemption from applicable codes requirements.

Contract Management: This week, the field office sent LANL direction regarding contractual implementation of DOE Order 420.1C, *Facility Safety*. DOE issued this version of the Order on December 4, 2012. LANL's original implementation plan included actions extending to September 2019. The field office requested a revised implementation plan by June 2, 2014, to include acceleration of the schedule, inclusion of the order revision into the code of record for new projects beginning this fiscal year, and revision of the Engineering Standards Manual for structural work and hazardous processes this fiscal year, among several other actions.

Federal Oversight: Last week, the field office transmitted to LANL the results of a vital safety system assessment for credited vehicle barriers at the WCRR Repackaging Facility, the RANT Shipping Facility, and Area G. The field office identified that vehicle barriers were not present for a ~25' length at RANT and at one pit location at Area G, contrary to the approved safety bases. They noted that these issues were discovered in early September 2013 and that LANL has yet to critique or enter the new information process. The field office also noted several safety basis issues, including concerns with the flow-down of requirements, non-specific or missing performance criteria, and inadequate surveillance requirements. The field office requested LANL's issue tracking system numbers associated with these issues within 15 days.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 27, 2013

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 27, 2013

LANL operations closed on Tuesday night for the annual winter holiday break. Operations will resume on January 2, 2014. The Site Representative office was closed Wednesday through Friday.

Chemistry and Metallurgy Research (CMR) Building–Exit Strategy: In guidance issued nearly two years ago (see 2/17/12 weekly), NNSA identified a revised target of approximately 2019 to complete the orderly phase out of programmatic activities from CMR. LANL planners currently indicate that the critical path to achieving this target includes actions to repurpose certain rooms in the Plutonium Facility (PF-4) to support analytical chemistry and materials characterization activities. LANL requires this repurposing because the new Radiological Laboratory Utility Office Building (RLUOB) will not provide all of the capabilities and associated capacities required to meet anticipated program commitments. The repurposing of PF-4 rooms will require: (1) removal of contaminated equipment from at least three rooms, (2) procurement and installation of new equipment into these rooms, (3) completion of readiness activities, and (4) validation of results against parallel testing performed on existing equipment in CMR.

The Site Representatives note that accomplishing the repurposing in the remaining five-year period will be challenging in an operating nuclear facility. In addition, recent Congressional direction may constrain the amount of repurposing work LANL can undertake until a line item project is established. If LANL cannot accomplish the repurposing in time, they will need to examine tradeoffs between continuing programmatic activities in CMR, utilizing off-site vendors, and limiting support to the program. In early 2014, NNSA expects to issue high-level program direction for this effort and an execution plan covering the RLUOB installation activities for the remainder of fiscal year 2014.

Radioactive Liquid Waste Treatment Facility (RLWTF): The field office recently issued a Safety Evaluation Report that approved a new Documented Safety Analysis (DSA) and Technical Safety Requirements. The RLWTF is a hazard category 3 nuclear facility that collects, stores, and processes low-level and transuranic liquid wastes. The new DSA replaces a safety basis that was developed and approved in 1995. Based on the analyzed potential consequences to the public and workers, no safety-related structures, systems, or components are identified; however, defense-in-depth controls in the DSA are identified as Other Equipment Important to Safety (OEITS) consistent with the LANL technical guidance (see 10/25/13 weekly). The safety basis also includes an overall facility material-at-risk limit of 55 Ci of americium-241 equivalent. RLWTF management is now pursuing implementation, including conduct of an Implementation Verification Review.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 3, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 3, 2014

The laboratory was closed Monday through Wednesday this week for the annual holiday break.

Weapons Engineering Tritium Facility (WETF): LANL submitted a Justification for Continued Operation (JCO) based on the discovery of an increased probability of WETF Oxygen Monitoring System (OMS) failure to the field office for review and approval (see 11/29/13 weekly). The submitted JCO evaluates the safety of the situation and concludes that the facility is in a safe condition based on the immediate actions taken, which include placing the Tritium Gas Containment System and the Tritium Waste Treatment System low-pressure receiver in warm standby mode. The JCO specifies that a monthly as-found calibration check of the OMS will now be performed in addition to the semi-annual Technical Safety Requirement calibration check. During the first monthly as-found calibration check that was performed in December, several OMS sensors were again found out of calibration. WETF personnel continue to evaluate the OMS to determine the appropriate calibration method and frequency.

Radioactive Liquid Waste Treatment Facility (RLWTF): LANL recently submitted a request to the field office to use the Waste Mitigation Risk Management (WMRM) facility for influent low-level liquid waste storage in addition to its intended function of providing emergency space for low-level liquid waste. This request follows WMRM facility system modification and a Management Self Assessment to ensure readiness (see 8/6/13 and 9/14/12 weekly reports). Approval of the request will allow replacement of aging RLWTF tanks that do not meet regulatory requirements while maintaining sufficient capacity for low-level liquid waste storage under emergency conditions requiring facility or site evacuations (e.g. wildland fire conditions).

Plutonium Facility – Safety Basis: In December, the field office directed LANL to resubmit the 2013 annual update of the Documented Safety Analysis (DSA) and Technical Safety Requirements (TSRs) within 45 days. Although LANL submitted annual updates to the DSA and TSRs in 2012 and 2013, the field office has not approved an annual update since 2011. The 2013 annual update includes the following changes:

- Resolution of field office comments from the 2012 annual update that was not approved and comments included in the safety evaluation report
- Changes to address Potential Inadequacies of the Safety Analysis, Evaluations of the Safety of the Situation, and JCOs that have been identified for the Plutonium Facility
- Re-evaluation of the leak path factor for the seismic accident scenario and identification of new material at risk limits
- Incorporation of changes to address the Transuranic High Efficiency Neutron Counter (TRU HENC) operations (see 10/4/13 weekly)

The field office response requested LANL to remove the changes associated with the TRU HENC operations (the field office previously provided comments on these changes) and changes associated with a PISA for the ventilation and facility control system, which require additional analysis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 10, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending January 10, 2014

Criticality Safety: Last month, LANL released its *Criticality Safety Infractions Causal Analysis*, performed largely in response to the Board's July 15, 2013, letter to DOE on criticality safety at the Plutonium Facility. A six-person causal analysis team was appointed by the Laboratory Director to analyze a series of criticality safety infractions that occurred in the Plutonium Facility from January to August 2013. The team conducted interviews, performed walk-downs, and reviewed documents related to criticality safety infractions or process deviations that occurred during that time period. Overall, the team identified five root causal factors supported by 22 contributing causes, many of which appear applicable to other facilities and functional areas. The following is a list of some of the key contributing causes:

- Current efforts appear reactive, rather than executing to a strategic plan with prioritized actions
- Lack of robust communications reflects insufficient management attention to the causes of infractions and needed corrective actions
- Roles and responsibilities are not consistent, not flowed down, and not well communicated
- Unclear requirements and terminology identified during critiques have not been effectively evaluated and corrected
- Conduct of operations issues evident in criticality safety events are not probed to determine issues and corrective actions, including improvements needed in management
- Documented hazard analyses did not account for collocated hazards and controls
- Critique process and output is insufficient to drive enduring improvements
- Internal assessments are not used to self-identify issues and resolve them
- Corrective actions are vague and focus on actions that are near-term and easier to achieve
- Lessons learned information does not provide clear operational insight, nor is it adequately communicated and implemented

Training: This week, the site reps observed an oral board for a criticality safety analyst (CSA) qualifying in the 300 area of the Plutonium Facility. The qualification process for CSAs at LANL is a three part process that includes a training curriculum for criticality safety technical knowledge, a requirement to demonstrate facility specific knowledge, and a practical exercise to demonstrate competency at performing criticality safety evaluations. The board conducted a thorough examination of the qualifying CSA's knowledge of general facility and 300 Area specific process and criticality safety. The board concluded that the qualifying CSA demonstrated acceptable knowledge.

Plutonium Facility – Safety Basis: The field office provided feedback to LANL this week on resolution of two conditions of approval from the 2011 Safety Evaluation Report associated with process descriptions and Hazard Analysis (HA). The latter requires LANL to revisit the process hazard analyses for operations at the Plutonium Facility to ensure a comprehensive evaluation of accident scenarios. The HA development process and results were submitted to the field office in September 2013 and include hazard scenario development, hazard identification, and control identification. Following resolution of field office comments, the HA results will be used to support the 2014 safety basis annual update that is scheduled to be submitted in September 2014.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 17, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending January 17, 2014

Criticality Safety: Dr. Jerry McKamy completed his first two-week onsite visit to support the field office and LANL Director on criticality safety issues. His detail runs through June 2014.

Last month, LANL issued an update to their staffing plan for criticality safety. For fiscal year 2014, the plan shows an analyzed need of 20.75 full time equivalent personnel with 13.25 currently acquired. As of this week, the qualification status includes one full-time analyst qualified for all facilities, two analysts qualified for individual portions of the Plutonium Facility, and one analyst qualified for the Chemistry and Metallurgy Research Building. In addition, there are six new hires currently qualified to perform calculations along with seven part-time and sub-contractor personnel with various qualifications to supplement these analysts.

Training: On Tuesday, the Site Representatives observed a demonstration of virtual facility familiarization and training software in development by LANL for Los Alamos County Fire Department personnel. LANL is using modern commercial software used by the video game industry to create realistic, high fidelity models of high-hazard facilities. The training contains pre-defined tours, as well as interactive, multi-person capability that includes simulated glovebox firefighting and contamination control. LANL representatives believe this capability is the first in the DOE complex and expect to release the software for the Plutonium Facility at the end of February 2014. The Site Representatives note the potential to utilize these software models for a variety of other training applications.

Plutonium Facility: LANL convened its Joint Evaluation Team this week to review certain paused activities to determine their potential need for readiness assessments prior to restart. Three hazard category 2 activities were evaluated and assessed to require federal readiness assessments if they are not resumed within one year of their last performance. These activities include: pyrochemistry processing, last performed in May 2013; foundry operations, last performed in June 2013; and aqueous processing, last performed in January 2014. Plutonium Facility personnel are evaluating the appropriate scope for these activities.

Radiological Laboratory, Utility, and Office Building (RLUOB): This week, RLUOB management received approval to begin cold (non-radiological) chemical operations in the laboratory areas. Pre-start findings applicable to cold chemical operations that were identified in the Management Self-Assessment completed last year have been closed (see 5/31/13 weekly). RLUOB personnel plan to start these operations next week and continue worker training, procedure improvements, and equipment qualification. Currently, radiological operations are scheduled to commence this summer. During RLUOB construction, only a limited number of laboratory rooms were outfitted with analytical chemistry equipment. LANL continues to pursue plans for outfitting additional laboratory space and increasing the facility material limit to 38 grams of plutonium-239 equivalent consistent with the NNSA supplemental guidance to DOE Standard 1027.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 24, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending January 24, 2014

Federal Oversight: This week, the acting field office manager announced that on an interim basis, the Assistant Managers for Safety Operations and Field Operations will be combined under a single manager. To support this larger group, NNSA is pursuing a deputy position that will be initially filled as a local detail assignment. In addition, the acting manager identified that an expression of interest will be released for a detail assignment as the senior safety and technical advisor position. This position is expected to be permanently assigned in the near future. The field office also released a report that determined the need for 15 facility representatives with a current staffing of 11.

Confinement Vessel Disposition (CVD) Project: Last Friday, LANL submitted to the field office for review and approval a corrective action plan for the CVD Operational Readiness Review completed in October 2013. LANL personnel conducted a causal analysis in order to inform the identified corrective actions (see 11/22/13 weekly). Of note, the causal analysis attributed a large number of the findings to management guidance and expectations not being clearly defined, understood, or enforced. LANL management is tracking to closure all pre-start and post-start findings using the Performance Feedback and Improvement Tracking System. All pre-start findings are currently scheduled to be complete by April 15, 2014. Chemistry and Metallurgy Research Building management evaluated all post-start findings and concluded that none pose risks that would require additional compensatory measures or mitigating actions to support startup of CVD operations.

Weapons Engineering Tritium Facility (WETF): On Wednesday, LANL personnel briefed the field office on the status of their efforts to disposition legacy items containing tritium. WETF personnel noted that their cataloging effort revealed more than 1100 items requiring disposition. As part of this effort, workers photographed, analyzed, and researched each item in order to support binning into one of several disposition solution packages. LANL plans to disposition about 150 tritium items, containing a total of less than 10 g of tritium, in the remainder of fiscal year 2014. As explained during the briefing, LANL will be unable to achieve substantial inventory reductions until the facility completes readiness activities and receives field office authorization to resume operations, which is currently scheduled to occur in the next few months. WETF personnel will then need to remove tritium from the Tritium Load-in Glovebox to facilitate installation of new mercury removal traps and load-out equipment. This equipment is required to process many of the bulk-tritium containing items into a form acceptable for shipping to the Savannah River Site. Design of the traps, which may require additional safety basis changes and readiness activities, is currently underway.

Last Friday, LANL submitted to the field office a revised Justification for Continued Operations (JCO) regarding the Oxygen Monitoring System (OMS) (see 1/3/14 weekly). The revised JCO continues to propose a monthly surveillance and calibration check of the system as a compensatory measure for the observed decrease in OMS sensor reliability. The JCO notes that the system would not be declared operable until WETF management ensures the sensors will remain in calibration for at least 30 days. To-date, WETF personnel have performed two 30-day calibration checks and observed calibration issues with several sensors during each check. WETF engineers are attempting to troubleshoot and resolve these problems. An operable OMS will be needed to support the disposition of legacy items discussed above.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 31, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 31, 2014

DNFSB Staff Activity: This week, staff members Dunlevy and McCoy conducted a review of the Area G safety basis. As a result of questions raised by the staff, Area G management declared a Potential Inadequacy of the Safety Analysis (PISA) and entered a second issue into the New Information process to screen it for status as a PISA. On Wednesday, the Site Representatives attended a meeting of the Northern New Mexico Citizens' Advisory Board focused on transuranic waste disposition activities at Area G.

Federal Oversight: Effective this week, Ms. Kimberly Davis Lebak is the manager of the field office. On Wednesday, the field office issued the annual workforce staffing analysis for the safety engineering team. The analysis indicates a full on-board complement of four safety system oversight engineers, one technical training specialist, and one maintenance manager; however, the analysis also identifies a shortfall of two fire protection engineers.

Contract Management: On Wednesday, NNSA released the fiscal year 2013 Performance Evaluation Report that details the basis of the fee determination for LANL. Overall, LANL earned an 89 % with a 49 % for Operations and Management, which covers most nuclear safety related topical areas.

Plutonium Facility–Seismic Safety: PF-4 personnel completed actions to wrap the captured short columns with fiber-reinforced polymer (see 12/13/13 weekly). This action improved the ability of the facility to withstand a seismic event. Design activities are underway to wrap the roof girders, which is the next significant structural improvement planned to commence later this year.

Plutonium Facility–Safety Basis: On Monday, the field office forwarded to NNSA Headquarters for approval a revised Safety Evaluation Report (SER) for the *TA-55 Documented Safety Analysis Addendum in Response to Nonlinear Seismic Analysis Results*. The field office recommended approval of the revised SER, which incorporates the results of LANL analysis of the facility structural performance against Section 9.3.6 of DOE-STD-1020-2012. The field office also noted that LANL's analysis methodology of combining fragilities may go beyond the intent of the standard for existing facilities and therefore may warrant additional Headquarters guidance.

Plutonium Facility–Criticality Safety: Last Friday, LANL submitted to the field office for approval a listing of 45 fissile material operations (FMOs) assessed to have an adequate technical basis to support resumption. This list builds upon the previous list of 228 FMOs approved by the field office last November (see 11/15/13 weekly). For these FMOs, LANL has concluded that there is adequate technical basis to have high confidence that the currently identified criticality safety controls are adequate. Several of the FMOs in these lists rely on alternative evaluations types that do not meet DOE expectations for criticality safety evaluations. LANL personnel are currently developing modern technical bases intended to facilitate rapid issuance of compliant evaluations; however, they do not intend to use these bases to develop compliant evaluations for the low risk operations until sometime after operations have resumed.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 7, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending February 7, 2014

DNFSB Staff Activity: On Thursday, R. T. Davis deployed to the Waste Isolation Pilot Plant to monitor the investigation of the underground fire involving a salt handling truck.

Chemistry and Metallurgy Research (CMR) Building–Exit Strategy: Last month, the NNSA Office of Defense Programs issued a memorandum transmitting the government’s strategy for plutonium infrastructure investments at LANL. The strategy consists of three steps: (1) maximizing the use of the Radiological Laboratory Utility Office Building (RLUOB), (2) reusing space in the Plutonium Facility (PF-4), and (3) evaluating options to extend the lifetime of PF-4 through modular additions. The strategy notes that the first two steps are required to cease programmatic operations in CMR. These steps entail implementing NNSA’s Supplemental Guidance for DOE-STD-1027 to increase the material-at-risk limit in RLUOB from 8.4 g to 38.6 g of Pu-239 equivalent, outfitting about 11 laboratory rooms in RLUOB with analytical chemistry capabilities, and removing existing equipment and re-equipping four rooms in PF-4 with analytical chemistry and materials characterization capabilities (see 12/27/13 weekly). The strategy indicates that initial funding will be used to develop pre-conceptual design documentation and a resource-loaded schedule. NNSA does not specifically commit to an acquisition approach and notes that the use of operating expense funds or the more rigid Major Item of Equipment approach (an acquisition type included in DOE Order 413.3 for equipment with little installation cost) provides the execution speed needed to reduce risk exposure in CMR before it either needs additional infrastructure investment or simply fails.

Weapons Engineering Tritium Facility (WETF): This week, WETF management declared a Technical Safety Requirement (TSR) violation after personnel discovered three secondary tritium containment vessels with open valves. These safety class vessels cannot perform their credited containment function with open valves. WETF received these legacy vessels in the 1990’s from another technical area at LANL. Personnel discovered the first vessel with an open valve in October 2013 during an inventory of legacy tritium items and did not recognize that this condition represented a safety basis issue. Following discovery of a third vessel with an open valve in January 2014, a worker notified a WETF manager, who then directed capturing the issue for later review. In February, the WETF Management Review Board tasked a safety basis analyst to consider the need to declare a Potential Inadequacy of the Safety Analysis (PISA). Subsequent to declaring the PISA, WETF management critiqued the issue and determined that the condition represented a TSR violation. The critique revealed that personnel had verified 30 additional similar vessels have closed valves, but identified the need to verify other vessel types have closed valves and to revise procedures to ensure that valves are closed following all work with containment vessels.

Safety Basis: Last Friday, LANL submitted to the field office a safety basis improvement plan (see 11/15/13 weekly). The plan identified the need to develop several products including: a staffing strategy, upgraded qualification standards for analysts, revised institutional processes and procedures, a performance assurance plan, a site-wide safety basis to encompass all safety management programs, a Management Review Team to focus on communications and issue management with the field office, a revised technical document examining dispersion analysis for the site, a laboratory safety basis council, and a nuclear facilities risk assessment to facilitate resource allocation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 14, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 14, 2014

DNFSB Staff Activity: R. T. Davis remained deployed to the Waste Isolation Pilot Plant (WIPP) to monitor the accident investigation of the underground fire involving a salt handling truck.

Chemistry and Metallurgy Research (CMR) Building–Criticality Safety: LANL personnel identified two criticality safety infractions during the past two weeks. In one instance, workers were unable to determine readily whether material quantities complied with nuclear criticality safety limit approval (CSLA). In another instance, a supervisor identified that the combination of material types in a staging location did not comply with the applicable CSLA. In both cases, facility personnel took appropriate actions and facility management conducted critiques of the event. Facility management directed additional causal analysis to formally evaluate the root causes of these infractions. Facility management also requested an external team to conduct an extent of condition review. The review team is to determine whether issues identified in a causal analysis of criticality safety issues in the Plutonium Facility extend to CMR, as well as to evaluate the effectiveness of the flow-down and implementation of institutional criticality safety requirements.

CMR–Confinement Vessel Disposition (CVD) Project: This week, the field office approved LANL’s corrective action plan for the CVD Operational Readiness Review (see 1/24/14 weekly).

Plutonium Facility–Criticality Safety: On Monday, the field office concurred with the listing of 275 fissile material operations judged to have an adequate technical basis (see 1/31/14 weekly). The field office acknowledged compliance issues with some of these operations, but noted the issues do not have a substantive impact on nuclear safety due to the inherent criticality control provided by material mass, form, container requirements, and geometry.

Recently, criticality safety analysts completed a technical document defending the sub-criticality of 520 g of plutonium-239 in any form. This document is the first of several general case limits intended to provide a robust technical underpinning and an accelerated development time for new or revised criticality safety evaluations.

Startup and Restart: On Thursday, the field office approved the quarterly startup notification report with direction to LANL to conduct a federal readiness assessment (checklist type) for retrieval and storage operations of the corrugated metal pipes (CMPs). The CMPs are 20-foot long metal pipes that contain cemented nuclear materials and are currently in buried locations at Area G. The CMPs will ultimately require size reduction prior to disposition at the WIPP.

Area G–Safety Basis: On Thursday, facility management requested and received dispensation from the field office to the LANL requirement to evaluate New Information for applicability of a Potential Inadequacy of the Safety Analysis (PISA) within nine working days. In this instance, facility management entered the New Information process after a recent staff review (see 1/31/14 weekly) raised questions on the adequacy of vehicle barriers for stopping certain pieces of heavy moving equipment. Engineering staff require additional time to complete revised calculations to determine whether a PISA exists. In the interim, facility management restricted the movement of all heavy moving equipment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 21, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 21, 2014

DNFSB Staff Activity: R. T. Davis remained deployed to the Waste Isolation Pilot Plant to monitor the accident investigation of the underground fire involving a salt handling truck and the separate radiological contamination event.

Plutonium Facility–Criticality Safety: Last Friday, LANL released a *Resumption Strategy and Schedule* to the field office, headquarters, and various program sponsors. The strategy outlines a number of actions to strengthen, standardize, streamline, and sustain improvements to criticality safety and conduct of operations. A central element of many of these improvements is the development and use of robust technical basis documents analyzing sets of common material limits and conditions (see 2/14/14 weekly). In the near term, management intends to conduct pilots for each of the six currently identified standardized conditions, which will involve revisions to criticality safety evaluations, limit approvals, postings, and procedures, as appropriate. From a schedule standpoint, the strategy provides projections for a number of programmatic activities. Management believes this schedule is conservative and expects to achieve efficiencies, particularly through the implementation of the new standardized conditions. The first projected start date is March 31, 2014, for an enriched uranium metallography operation. The last projected milestone is the resumption of electrorefining operations by February 24, 2015. The schedule does not cover aqueous operations.

Criticality Safety: On Tuesday, LANL transmitted a revision of the institutional Nuclear Criticality Program document (SD130) to the field office for approval. The primary changes associated with this revision include: (1) establishing *de minimis* values for requiring a criticality safety evaluation, (2) clarifying requirements for postings, (3) making limit approval documents optional, (4) requiring criticality controls in procedures, and (5) allowing criticality limits to be set below the values established in the governing evaluation.

Weapons Engineering Tritium Facility (WETF): On Tuesday, the field office issued their Safety Evaluation Report for the deficiencies associated with the oxygen monitoring system (OMS) (see 1/24/14 weekly). The field office noted several quality problems with the submittal and provided further directed actions to the laboratory. The directed actions primarily require WETF personnel to utilize technically defensible trending data to verify the OMS remains in calibration during the 31-day period prior to declaring the system operable. The Site Representatives note that WETF instrumentation systems are not capable of providing trending data on the state of OMS calibration. Absent the ability to automatically collect this data, WETF management plans to take as-found calibration readings around the 21 and 31-day marks, the first of which should occur next week.

Readiness Reviews: Last week, LANL submitted a change to the laboratory procedure governing the conduct of readiness reviews (P115) to the field office for review and approval. This change was developed in response to lessons learned from the Federal Operational Readiness Review of the Confinement Vessel Disposition Project (see 10/11/13 weekly). Specifically, the change was made to ensure that adequate actions are taken to maintain operational readiness when an excessive amount of time elapses between readiness reviews.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 28, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending February 28, 2014

DNFSB Staff Activity: R.K. Verhaagen relieved R.T. Davis at the Waste Isolation Pilot Plant for the continued monitoring of recovery actions associated with the radiological contamination event.

Weapons Engineering Tritium Facility (WETF): On Tuesday, WETF personnel identified that three of eight sensors were out of specification during a calibration check of the Oxygen Monitoring System (OMS). This was the first calibration check since personnel made adjustments to the system earlier in the month. The calibration check is performed against the oxygen content of normal room air (~21 %) and a 3 % oxygen calibration gas. The failed sensors read as high as 25 % and as low as 6 % for room air. In accordance with field office direction (see 2/21/14 weekly), LANL is no longer authorized to continue restart activities for tritium processing and is required to submit to the field office a technical strategy for resolving the OMS problems. Based on the 26-year-old age of the system hardware, the observed failures in both directions, the inconsistencies in the sensors that are failing, and the lack of success with attempted corrective actions, WETF management has determined to upgrade the system hardware to digital. The Site Representatives note that the digital system will continue to rely on electrolyte-based sensors and such sensors have been problematic in similar applications at the Savannah River Site.

Criticality Safety: On Monday, the field office approved without condition the revision to the institutional Nuclear Criticality Safety Program document (SD-130) (see 2/21/14 weekly).

Plutonium Facility–Criticality Safety: On Monday, the LANL Director approved a request to delegate resumption release authority for 106 fissile material operations (FMOs) to the Principle Associate Director for Weapons Programs. These 106 FMOs were part of the 275 FMOs recently approved by the field office as having adequate technical bases despite some known non-compliances (see weekly 2/14/14). These FMOs involve vault locations and the storage, staging, non-destructive assay, and certain glovebox operations involving a single pit or containerized items. Previously, the LANL Director delegated release authority for all FMOs involving less than 520 g of plutonium to the Associate Director for Plutonium Science and Manufacturing (see 10/22/13 weekly). Overall, the number of delegated FMOs represents about 160 of the more than 400 FMOs in the Plutonium Facility. To support these delegations, Plutonium Facility management intends to revise the release resumption process to allow these FMOs to defer certain corrective actions related to criticality safety to post-resumption as long as the actions are captured in the Performance Feedback Issues Tracking System.

Area G–Safety Basis: Last week, the field office approved without conditions revision 2.3 of the Basis for Interim Operations and associated Technical Safety Requirements. This week, LANL personnel independently verified the revision as implemented. Notably, this revision allows Area G personnel to vent certain sealed pencil tanks that require processing as part of the 3706 Campaign. Overall, Area G management expects to complete processing of all 3706 waste by mid-March and complete final assay and certification in April. At that point, all 3706 waste will be ready for offsite shipment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 7, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 7, 2014

DNFSB Staff Activity: R. T. Davis returned to the Waste Isolation Pilot Plant to relieve R.K. Verhaagen for the continued monitoring of recovery actions associated with the radiological contamination event.

Criticality Safety: On Wednesday, LANL transmitted to the field office a project management plan for *Nuclear Criticality Safety Program Upgrades*. This institutional plan consists of a compilation of criticality safety issues and their associated Performance Feedback and Issues Tracking System numbers going back to 2005. Each issue is grouped within five separate sub-projects focused on the following areas: (1) developing the Nuclear Criticality Safety Program (NCSP), (2) establishing a revitalized Nuclear Criticality Safety Committee, (3) establishing a strong partnership between operations and the NCSP, (4) implementing checks and balances to ensure the NCSP attains and maintains full compliance with applicable requirements, and (5) implementing a performance assurance plan to support NCSP evaluation and continuous improvement. LANL is currently working to develop a resource-loaded schedule for each of the five sub-projects, which cumulatively contain about 200 separate actions.

Plutonium Facility: This week, program personnel nearly completed the last aqueous operations required to place the facility in a safe and stable configuration as part of exempted activities under the Director's pause. Specifically, personnel cemented the evaporation residuals from several hundred liters of low plutonium concentration solutions generated during an ion exchange operation that completed at the onset of the pause in late June 2013. The work crew encountered numerous difficulties associated with their procedures, training, and equipment, which resulted in the protracted time line. They expect to complete the final two cement drums next week.

Radiological Safety: Last week, the Confinement Vessel Disposition (CVD) project personnel received a briefing from a Six Sigma Blackbelt regarding the results of a recent study aimed at decreasing the number of glovebox glove breaches. The study focused on the causes of the 65 glove breaches that occurred at the Plutonium Facility from July 2011 to September 2012. The study identified that the leading cause of breaches was latent sharps, in particular work involving bolts, corroded/oxidized metal, and tube cutters. Plutonium Facility personnel are currently developing corrective actions based on the findings. The Site Representatives note that facilities other than the Plutonium Facility would benefit from corrective actions, including training based on the results of the study that provides more than awareness. For example, the identified latent hazards are prevalent during the CVD operation.

Area G–Radiological Safety: On Monday evening, a worker who had cleared multiple radioactive contamination surveys detected contamination on his boots during a final elective survey he performed for peace of mind. Follow-up surveys then detected contamination on his cheek. Radiological control personnel were able to decon both areas. On Tuesday afternoon, facility management conducted a critique of the incident. The critique identified issues with protective clothing doffing, survey practices and responses by radiological control personnel, and worker positioning in contamination survey equipment. Notably, the critique identified that documentation did not include the expectation that radiological control assistance be provided during the entirety of the doffing process for individuals when contamination is detected on outer protective clothing.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 14, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 14, 2014

DNFSB Staff Activity: R. T. Davis remained deployed to the Waste Isolation Pilot Plant for the continued monitoring of recovery actions associated with the radiological contamination event.

R.K. Verhaagen and J.W. Plaue were at DNFSB Headquarters to provide the Board with a periodic status briefing on the laboratory.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 21, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 21, 2014

DNFSB Staff Activity: R.T. Davis, R.K. Verhaagen, and B. Broderick continued monitoring the recovery associated with the radioactive material release event at the Waste Isolation Pilot Plant.

Plutonium Facility–Criticality Safety: On Tuesday, facility management declared a Potential Inadequacy in the Safety Analysis based on New Information in the form of completed calculations that indicate the potential to flood a glovebox from sprinkler water through either a burned glove or an inlet filter. Criticality analysis and current inventory information further indicate about 24 locations that may not remain subcritical in a flooded condition. Immediate compensatory actions taken include: (1) ensuring immediate orderly exit from the facility upon receipt of a fire indication, (2) advising responding fire fighters of the situation, and (3) prohibiting the aggregation of more than 4500 g of fissile material in a single location. Personnel are also determining whether additional physical actions are needed to achieve a safe and stable configuration in the 24 locations.

Plutonium Facility–Safety System Degradation: On Monday, facility management reported and then critiqued the discovery of breached elastomeric sealing boots on a glovebox used to perform equation-of-state measurements. During the critique, personnel discussed the fact that these boots were not recognized as part of the safety significant confinement boundary. As a result, specification information, preventative maintenance protocols, and critical spares were not available. Critique personnel did not discuss what contributed to this gap or the need to perform an extent-of-condition review to determine if other unique pieces of confinement equipment were similarly uncontrolled. Program personnel discussed the desire to proceed with a temporary modification to the degraded boots involving tape, plastic bags, and additional radiological controls to support measurements for a near-term milestone.

At the Plutonium Facility, gloveboxes are considered Design Features and are not provided with Limiting Conditions for Operations (LCO). The Site Representatives note that other sites (e.g., LLNL) provide LCO coverage for Design Features as a best management practice.

Plutonium Facility–Unique Capabilities: The Special Recovery Line (SRL) is a unique capability within the NNSA complex to process an inadvertently boosted pit. Recently, LANL managers briefed the results of a study on the future of the SRL to NNSA Headquarters. The study, completed last summer, recommends processing the items currently stored at LANL during the next few years and then no longer maintaining the capability. LANL noted that about 5 to 7 years would be necessary to reconstitute a SRL-like capability once lost and further recommended that NNSA establish the equipment, procedures, and trained personnel to respond in the event that a pit is inadvertently boosted.

Weapons Engineering Tritium Facility (WETF): WETF personnel completed the second week of their management self-assessment in preparation for upcoming readiness reviews. Meanwhile, engineering staff continued efforts to replace the modules for the inoperable Oxygen Monitoring System (OMS) (see 2/28/14 weekly). Last week, WETF submitted to the field office a revised Justification for Continued Operations that asserts the OMS can be declared operable following replacement of the modules without further in-service testing, despite no firm evidence that the replaced modules were the cause of previous failures. WETF has also yet to declare whether operability of the OMS will be a prerequisite to commencing the contractor readiness assessment projected to start on March 31, 2014.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 28, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 28, 2014

DNFSB Staff Activity: R.K. Verhaagen continued monitoring the recovery associated with the radioactive material release event at the Waste Isolation Pilot Plant (WIPP). M.P. Duncan and P.J. Foster observed the weeklong Construction Project Review (CPR) for the Transuranic Waste Facility project. On Thursday, B.A. Laake and R.P. Arnold met with LANL personnel to discuss weapons response.

Area G–Operations: Last week, Area G personnel completed processing the final waste packages associated with the 3706 Campaign. Final assay for these packages should occur in early April. Next week, Area G personnel plan to commence shipping transuranic waste packages to Waste Control Specialists in Andrews, Texas for interim storage until the WIPP can resume accepting waste.

Area G–Safety Basis: Last Friday, Area G personnel submitted to the field office an Evaluation of the Safety of the Situation (ESS) for the Potential Inadequacy in the Safety Analysis (PISA) concerning unanalyzed pool fires involving drums containing 100 % combustible waste. This PISA was declared subsequent to the Board’s staff review (see 1/31/14 weekly). The ESS notes an operational restriction on the receipt of newly generated waste and anticipates resolution as part of a safety basis page change expected to be submitted to the field office next week.

Plutonium Facility–Criticality Safety: Facility personnel completed additional analysis of the current conditions related to the PISA concerning unanalyzed flooding (see 3/21/14 weekly). Based on this analysis and as part of further immediate compensatory actions to achieve a safe and stable condition, facility personnel plan to move fissile material from about eight locations and place further restrictions maintaining containerization and prohibiting the addition of fissile material to several other locations.

Weapons Engineering Tritium Facility: Facility personnel completed installation of the new digital modules for the Oxygen Monitoring System and briefed the field office on their proposal to declare the system operable following post-maintenance testing (see 3/21/14 weekly). The field office did not agree with this basis and is expected to direct in-service testing prior to an operability declaration as a condition of approval for the revised ESS. As a result, the contractor readiness assessment will be delayed until early May. Separately, facility personnel requested and received from the field office a 15-day extension to the 9-day requirement for processing New Information related to potential errors in the hydraulic calculations underpinning the required riser pressure limit.

Transuranic Waste Facility (TWF): This week, NNSA performed a CPR to ensure the TWF project is ready to complete construction to meet the baseline technical scope within the approved cost and schedule. The CPR team identified a number of specific recommendations that require resolution and provided the following summary conclusions: (1) the project is ready for final preparations for Critical Decision-3, *Approve Start of Construction*; (2) the project can be completed by January 2018 within the current total project cost; and (3) additional resources are needed for both the federal and contractor project teams. NNSA review of CD-3 is scheduled to occur in May or June 2014.

Criticality Safety: On Tuesday, the LANL Director approved a charter for a revised Institutional Nuclear Criticality Safety Committee. Notably, the committee includes an external member from LLNL.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 4, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending April 4, 2014

DNFSB Staff Activity: R.T. Davis and R.K. Verhaagen continued monitoring the recovery associated with the radioactive material release event at the Waste Isolation Pilot Plant (WIPP).

Area G–Operations: Area G completed five shipments of transuranic waste packages to Waste Control Specialists in Andrews, Texas for interim storage until the WIPP can resume accepting waste. Area G personnel also completed the last offsite shipment of low-level waste associated with 3706 Campaign.

Plutonium Facility–Criticality Safety: Facility and program personnel continued planning for additional immediate actions associated with achieving a safe and stable configuration (i.e., removing excess fissile material from about eight locations) required by the Potential Inadequacy in the Safety Analysis (PISA) declared on March 18, 2014. Personnel expect the material movements to require at least another week resulting from difficulties finding movement paths and receipt locations caused by locations filled to their limits.

Weapons Engineering Tritium Facility (WETF): On Thursday, WETF management declared a PISA resulting from errors discovered by the field office in the hydraulic calculations supporting the safety significant fire protection system (see 3/28/14 weekly). The PISA indicates that the minimum riser pressure required by the Technical Safety Requirements may not be sufficient to support the most limiting demand. WETF personnel declared the system inoperable and entered the Limiting Condition of Operation, which requires a 24-hour fire watch performed on an hourly basis. During the critique required for the PISA, WETF personnel identified that: (1) calculations require update, (2) drawings require verification of as-built pipe sizes and lengths to support accurate revised calculations, (3) trending of water supply data indicates degradation and the need to investigate, and (4) upstream water supply valve lineups needed an expedited annual verification and an improperly sized component in the line requires analysis.

WETF personnel observed greater than expected electronic noise in the system associated with the newly installed digital modules for the Oxygen Monitoring System (OMS). For some modules, the magnitude of the noise was sufficient to result in spurious alarms. WETF personnel consulted with the manufacturer and determined that modifications to the electronics are necessary. The impact of this situation on the schedule for the contractor readiness assessment is unclear as the submitted plan of action does not list operability of the OMS as a prerequisite.

Conduct of Engineering: On Thursday, field office management concurred with LANL's declaration of implementation of the core elements of Conduct of Engineering at WETF. This action completes the final nuclear facility to achieve this status under the *Integrated Formality of Operations at LANL Project Plan* issued in November 2006.

Radiological Facilities: Last month, LANL personnel completed a study of the 124 previously identified radiological facilities across the laboratory. Conclusions of note include: (1) the listing was inaccurate, (2) more than half of the facilities could be delisted if surveys were performed to confirm that no legacy radioactive materials remained, (3) a need to establish a *de minimus* threshold for Radiological facility status, and (4) an additional 30 percent could be delisted by applying the *de minimus* threshold, creating a temporary Radiological facility provision, and creating a mechanism to consolidate operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 11, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 11, 2014

DNFSB Staff Activity: R.T. Davis continued monitoring the recovery associated with the radioactive material release event at the Waste Isolation Pilot Plant.

Plutonium Facility–Criticality Safety: On Tuesday, LANL transmitted to the field office for approval a combined Evaluation of the Safety of the Situation and Justification for Continued Operations (ESS/JCO) in response to the criticality concerns associated with firewater flooding (see 3/21/14 weekly). The ESS/JCO notes the potential to flood a glovebox through burned gloves during a fire and through inlet air filters or compromised windows during an actuation of the fire suppression system. The document further acknowledges that LANL has not analyzed more than 200 fissile material operations for this credible off normal event, as required by LANL and DOE requirements. The ESS/JCO proposes safe continued operations for this scenario with two compensatory control sets; one based on a 4500 g limit with some additional restriction and the other based on a 520 g limit. The ESS/JCO does not articulate how LANL will integrate these compensatory limits into their overall resumption process.

On Wednesday, program personnel completed the first movements of fissile material required as an immediate action for the Potential Inadequacy in the Safety Analysis associated with flooding. Also on Wednesday, facility operators received the timely order associated with additional immediate actions.

Chemistry and Metallurgy (CMR) Building–Safety Basis: On Monday, CMR management transmitted to the field office for approval safety basis changes required to resolve pre-start findings from the Operational Readiness Review for the Confinement Vessel Disposition project.

CMR–Exit Strategy: On Monday and Tuesday, the NNSA Associate Administrator for the Office of Acquisition and Project Management (APM) visited LANL to initiate planning activities associated with implementation of the plutonium strategy. In a memo dated March 27, 2014, the Acting NNSA Administrator tasked APM with the responsibility of managing investments in plutonium infrastructure. The memo included a reaffirmation of the commitment to cease programmatic operation in the CMR building by the end of calendar year 2019 and notes that all 3 phases of the plutonium strategy will be executed in a manner fully compliant with DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*. The memo tasks APM with providing an initial execution plan by June 30, 2014. LANL and field office personnel have begun forming integrated project teams in support of this effort. Based on discussion during the visit, NNSA expects to execute the first two steps of the strategy as new subprojects to the existing Chemistry and Metallurgy Research Replacement project line item. During the summer, NNSA plans to evaluate these steps as part of a reaffirmation of CD-1, *Approve Alternate Selection and Cost Range*. These steps are (1) equipping additional laboratory rooms in the Radiological Laboratory Utilities Office Building and (2) repurposing laboratory rooms within the Plutonium Facility.

Weapons Engineering Tritium Facility (WETF): On Wednesday, the field office formally rejected the revised ESS/JCO associated with the Oxygen Monitoring System (OMS) issues (see 3/21/14 weekly). The field office noted that the upgrade of the modules from analog to digital did not automatically resolve the issue and that post-upgrade trending was necessary to support an operability declaration. The field office directed LANL to determine the root cause of the OMS issues, demonstrate resolution through data trending, and request field office approval prior to declaring the OMS operable.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 18, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 18, 2014

DNFSB Staff Activity: R.K. Verhaagen and B.P. Broderick continued monitoring the recovery associated with the radioactive material release event at the Waste Isolation Pilot Plant.

Emergency Management: On Thursday, Plutonium Facility personnel participated in the annual emergency response exercise required by DOE Order 151.1C, *Comprehensive Emergency Management System*. This year's scenario was a nuclear criticality. Accordingly, the exercise also fulfilled the exercise requirement in ANSI/ANS-8.23-2007, *Nuclear Criticality Accident Emergency Planning and Response*. In addition to the immediate evacuation of personnel from the facility, the scenario included two injured workers, radiation levels encountered at a muster point, and a vehicle access gate that did not open as intended to facilitate response by the Los Alamos County Fire Department. During the post-exercise critiques, participants noted numerous opportunities for improvement, particularly with respect to communications between the Facility Incident Command, Incident Command, Facility Operations Center, and simulated Emergency Operations Center. Emergency Management personnel will develop an after-action report detailing these observations and providing corrective actions.

Plutonium Facility–Criticality Safety: On Monday, Plutonium Facility personnel briefed members of the institutional Nuclear Criticality Safety Committee on the implementation approach for the Evaluation of the Safety of the Situation/Justification for Continued Operations submitted to the field office last week. The committee expects to issue a formal position on this approach. On Wednesday, program personnel completed movements of fissile material required as immediate actions to place the facility in a safe and stable configuration (see 4/11/14 weekly).

Plutonium Facility: On Monday, facility personnel identified 13 containers that were potentially not included in the material-at-risk (MAR) surveillance required by the safety basis. Facility management entered the applicable limiting condition for operation until the containers could be included and verified to comply with the surveillance limits. During investigation of the issue, the system engineer determined that the software used to perform the surveillance (MAR Tracker) does not properly evaluate containers that are nested beyond a certain level. A software correction has been implemented.

Chemistry and Metallurgy Research (CMR) Building–Safety Basis: On Wednesday, the field office approved revision 3.2 of the CMR safety basis required to support startup of the Confinement Vessel Disposition project. CMR management briefed the field office that they expect to initiate disposition of the first sphere by June 14, 2014.

Transuranic Waste Facility Project: On Thursday, the field office transmitted to LANL a letter approving the exemption request from the requirement in DOE Order 420.1B, *Facility Safety*, to provide fire protection to the safety-class seismic switches. The safety function of these seismic switches is to isolate electrical power from certain portions of the facility during a design basis seismic event to prevent an electrical fault fire. NNSA-HQ approved the request with the concurrence of the Central Technical Authority and provided the following recommendations: (1) verification that the as-built conditions reflect those stated in the exemption request, (2) marking the area around the switches using paint and signage, and (3) implementing an administrative control for combustible materials prior to operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 25, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending April 25, 2014

DNFSB Staff Activity: D.N. Kupferer, J.C. McComb, and J.A. Pasko conducted an onsite review of progress made toward resolving the criticality safety and conduct of operations issues in the Plutonium Facility. J.A. Pasko and the Site Representatives also walked-down the recently completed seismically strengthened columns and work sites for near-term upgrades to the roof girders in the Plutonium Facility. R.T. Davis continued monitoring the recovery associated with the radioactive material release event at the Waste Isolation Pilot Plant.

Nuclear Environmental Sites: On Monday, LANL transmitted to the field office the results of a positive Unreviewed Safety Question Determination (USQD) regarding the planned demolition of a water tower in TA-21. The water tower, a 175 ft tall and about 1452 ton structure, sits in proximity to Material Disposal Area T and Material Disposal Area A, known as the General's tanks. The DOE Office of Environmental Management has separately contracted to demolish the water tower and tasked LANL to perform the USQD given the collocated Nuclear Environmental Sites. The USQD identified the planned demolition could increase the probability of occurrence and consequences of postulated accidents, as well as an increase in the probability and consequences of malfunction of safety equipment. The field office is determining a path forward.

Criticality Safety: Last week, LANL responded to the field office regarding the institutional *Nuclear Criticality Safety Program Upgrades* plan (see 3/7/14 weekly). This institutional plan is one of the two plans that collectively constitute the overall improvement effort documented in NNSA's response to the Board dated December 6, 2013. LANL indicated they will submit a revision of the institutional plan addressing the field office comments, including the need for a resource-loaded schedule, by June 30, 2014.

Plutonium Facility–Criticality Safety: Facility personnel performing a confirmatory neutron measurement on a standard waste box (SWB) identified that the measured value exceeded the limits specified by the criticality safety evaluation by a factor of nearly two. The measured value also exceeded the combined, individual measured values of the items inside the SWB by a factor of nearly four. Workers took the correct immediate actions to secure the area, back off, and make notifications. During a critique, facility personnel questioned the adequacy of the calibration of the equipment and agreed to reconvene to determine a path forward for confirming the contents of the SWB. The Site Representatives note that critique personnel did not bring or review as part of the critique the calibration procedure, the procedure for assaying the waste, or the procedure for loading the SWB.

Weapons Engineering Tritium Facility (WETF): On Thursday, LANL submitted to the field office the Evaluation of the Safety of the Situation (ESS) regarding the potentially inadequate firewater riser pressure (see 4/4/14 weekly). The ESS notes that a revised hydraulic calculation supported by new field measurements indicates the current required minimum pressure is adequate as currently written. The facility remains in a 24-hour fire watch performed hourly until the field office approves the ESS.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 2, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 2, 2014

DNFSB Staff Activity: R.T. Davis turned over to DNFSB Headquarters personnel the continued monitoring of the recovery associated with the radioactive material release event at the Waste Isolation Pilot Plant (WIPP).

Area G: On Thursday, the WIPP contractor declared a potential inadequacy of the safety analysis (PISA) concerning the postulated role of untreated nitrate salt waste materials contributing to the radioactive material release event. Given the nitrate salt waste originated at LANL, Area G management conducted a critique on Friday to review the situation. Critique participants determined about 105 waste containers potentially holding nitrate salts are currently stored at Area G. Area G management conservatively decided to control these containers as if they were unvented and transferred all of them except those currently in shipping containers and those that have not been remediated to a dome with a functional fire suppression system. In addition, Area G personnel will perform periodic thermography to determine the presence of any exothermic chemical reactions until the situation at WIPP is understood.

The critique participants also discussed the processing history for these salts, which are bottoms from an evaporator used in the aqueous nitric acid process at the Plutonium Facility. They confirmed that workers treated these materials in accordance with a procedure consistent with direction from WIPP's Difficult Waste Team. Separately, LANL management intends to standup a war room and deploy a senior management liaison to WIPP to facilitate the ongoing investigation.

Weapons Engineering Test Facility (WETF): This week, WETF personnel completed the 30-day surveillance associated with the PISA (see 4/11/14 weekly) on the oxygen monitoring system (OMS) and observed continued problems with the system. WETF personnel now believe there are problems with the recently installed new digital modules and are working with the vendor to develop a path forward. The OMS system has been inoperable since November 2013. WETF personnel continue to evolve their solutions without the aid of systematic root cause methodology. As a result of this week's failed surveillance, the team leader delayed the start of the laboratory readiness assessment that was scheduled to commence next Monday for at least 45 days. WETF has not operated since 2010 and operations are necessary to reduce the risk associated with a large inventory of legacy tritium-containing items.

WETF personnel also continued to resolve field office concerns with hydraulic calculations performed in response to a PISA on the fire suppression system (see 4/25/14 weekly). The facility continues in the fourth week of 24-hour fire watches performed hourly.

WETF-Emergency Management: On Friday, LANL transmitted to the field office the after-action report from a recent exercise involving a postulated glovebox deflagration. LANL identified nine opportunities for improvement including the following: telephone numbers need posting; additional telephones or roll-over capability are needed in the Facility Incident Command (FIC); operators need training on evacuating the Operations Center; the WETF radio system needs improvement; the FIC needs to develop a line of inquiry to provide appropriate initial information to the fire department; the exercise design process need to ensure realism; and stay-times and entry criteria for a tritium area need to be developed and provided in an easy to use reference for the fire department.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 9, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 9, 2014

DNFSB Staff Activity: M.P. Duncan, P.J. Foster, and J.A. Pasko conducted an onsite review of the Transuranic Waste Facility project on Tuesday and Wednesday. On Thursday, P.J. Foster and A.K. Gwal followed up on previous questions regarding electrical systems at the Plutonium Facility. R.G. Quirk supported the Site Representative office all week.

Plutonium Facility–Criticality Safety: On Tuesday, LANL issued a memo that retracts and replaces a previous memo that outlined the approach to identify criticality safety controls as part of the resumption process. The previous approach involved using new technical reference documents to develop or revise compliant criticality safety evaluations for higher mass operations prior to resumption. This process would address known safety margin concerns and insufficiently analyzed abnormal conditions (e.g., flooding and seismic events) in order to ensure the appropriate controls. The new approach centers around the firefighting water Evaluation of the Safety of the Situation and Justification for Continued Operations (ESS/JCO) and includes following paths: (1) requesting field office concurrence that an adequate technical basis exists for operations not covered by the ESS/JCO, (2) utilizing the ESS/JCO control set for covered operations and requesting additional field office concurrence, and (3) developing new criticality safety evaluations for those operations not covered by 1 or 2.

On Wednesday, LANL submitted to the field office a second revision of the firefighting water ESS/JCO (see 4/11/14 weekly). The revision includes enhanced technical basis information and commits to evaluate each operation to determine whether flooding or flooding-derived upsets require additional controls. This week, program personnel began determining whether additional immediate actions are necessary associated with small pieces and turnings of plutonium metal. The ESS/JCO places additional restrictions on these items, which were not reflected in the 4500 g criterion used for the initial immediate actions (see 3/21/14 weekly). On Thursday, facility and program personnel conducted a hot wash for the immediate actions and were unable to determine improvements that could have expedited the nearly month-long effort.

Weapons Engineering Tritium Facility (WETF): This week, WETF management assembled a team of engineering experts from across the laboratory to assist with restoring operability of the oxygen monitoring system (OMS). Operability of the OMS is necessary for facility restart (see 5/2/14 weekly). The engineering team intends to identify and repair the root causes of the OMS inoperability through a systematic troubleshooting process. The team has identified two separate issues it will focus troubleshooting efforts on: system noise and instrument drift. The team will also evaluate the calibration procedure and techniques to determine whether improvements are needed. Benchmarking of other oxygen monitoring systems on site and at the Savannah River Site will also be performed to see if additional insights can be gained into OMS reliability and maintenance.

Area G: LANL stood up a war room to triage information and actions associated with the potential that nitrate salt waste contributed to the radioactive release event at the Waste Isolation Pilot Plant (see 5/2/14 weekly). In addition to locating and controlling drums from this waste stream, laboratory personnel began performing chemical and radiological analyses to evaluate the current conditions of these materials.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 16, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.T. Davis, R.K. Verhaagen, and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 16, 2014

DNFSB Staff Activity: R.T. Davis completed his assignment as a site representative at LANL this week. J.W. Plaue attended the Nuclear Materials Management Team meeting in Denver, CO. R.K. Verhaagen was out of the office Wednesday to Friday.

Area G: On Friday, Area G management declared a Potential Inadequacy of the Safety Analysis (PISA) based on the unknown hazards and hazard frequency associated with nitrate salt wastes that have been treated with an organic based absorbent. During the investigation of the radioactive material release event, Waste Isolation Pilot Plant (WIPP) personnel identified a breached drum in the underground. Based on the location, the breached drum was narrowed down to one of two drums created at LANL that contain nitrate salt waste treated with organic cat litter.

Area G management received this new information on Thursday night and took immediate action to overpack a drum that is very similar to one of the suspect drums in the WIPP underground. This similar drum was created at the WCRR repackaging facility from the same parent drum as one of the suspect drums identified at WIPP. The following additional immediate actions and operational restrictions were identified for the PISA:

- Overpack all treated nitrate salt waste drums into standard waste boxes or pipe overpack containers (action in progress on Friday)
- Relocate all treated nitrate salt waste materials to a location with a fire suppression system (action in progress on Friday)
- Perform temperature monitoring of these waste items (currently being performed daily)
- Conduct headspace sampling and analysis of the standard waste box overpacks as needed

All sampling and intrusive evaluation of treated nitrate salt waste is on-hold pending evaluation of the PISA and identification of a safe path forward. LANL personnel continue to use a war room at Technical Area-63 to triage information and actions associated with this issue.

Plutonium Facility–Criticality Safety: This week, Plutonium Facility management held two critiques to evaluate the details and corrective actions associated with an item identified as an oxide material in the facility inventory database (LANMAS) that was located in a glovebox with criticality controls that specified metal only materials. Field office personnel pursued this issue in detail because the fissile material operation was recently evaluated by an annual walkdown and as part of the resumption process, neither of which identified the database discrepancy. Plutonium Facility personnel subsequently self-identified this issue as part of an extent of condition review that was completed prior to approving the operation for resumption.

During the critique, Plutonium Facility management identified that personnel performed the field evaluations without details from the inventory database in-hand, which is not consistent with facility management expectations. As part of the corrective actions, the procedure that includes the annual field walkdown will be revised to clarify that the LANMAS information should be specifically included and reviewed (the same checklist is used as part of the resumption process). Plutonium Facility management is also performing an extent of condition review for other fissile material operations that have been through the resumption process.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 23, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 23, 2014

Area G–Nitrate Salt Waste: Today, the LANL Director named Dr. Terry Wallace as the laboratory’s lead for coordinating efforts related to understanding the radiological release event at the Waste Isolation Pilot Plant (WIPP) and the associated implications for the transuranic waste currently stored at Area G. Dr. Wallace is the Principal Associate Director for Global Security.

In addition to the immediate actions taken in response to last week’s declared Potential Inadequacy of the Safety Analysis (see 5/16/14 weekly), LANL personnel have taken the following measures:

- Completed the relocation of all over-packed treated nitrate salt waste drums into a Permacon enclosure that affords fire suppression, a metal confinement structure, continuous air monitoring for airborne radioactive material, temperature control, and HEPA-filtered ventilation.
- Elected to also relocate all untreated (those without added organic kitty litter) nitrate salt waste drums into a Permacon.
- Strengthened emergency preparedness planning for the nitrate salt waste, including issuing standing orders to guide hourly operator rounds, development of a pre-incident response plan, and starting targeted walkthroughs with fire department and emergency response personnel.
- Established two independent teams of subject matter experts to review the available information, as well as initiated outreach to experts from the other national laboratories.
- Conducted a fact finding to determine whether the nitrate salts were treated and shipped in accordance with the WIPP waste acceptance criteria. Results are pending.

Plutonium Facility–Criticality Safety: Today, the field office transmitted to LANL a letter disapproving the submitted firefighting water Evaluation of the Safety of the Situation and Justification for Continued Operations (ESS/JCO) (see 4/11/14 weekly). Field office personnel and external federal criticality safety experts generated eleven comments. The more significant comments from the field office direct LANL to revise the ESS/JCO to: elevate certain compensatory measures to technical safety requirement level controls; prohibit certain fissile material operations that were not adequately analyzed; clearly define soluble compounds; and clearly identify which compensatory measures apply to which fissile material operations.

Plutonium Facility–Safety Basis: Also today, the field office transmitted to LANL a revised Safety Evaluation Report (SER) for the *TA-55 Documented Safety Analysis Addendum in Response to Nonlinear Seismic Analysis Results*. The SER incorporates the results of LANL analysis of the facility structural performance against Section 9.3.6 of DOE-STD-1020-2012 (see 1/31/14 weekly), and was approved by the NNSA Deputy Associate Administrator for Infrastructure and Operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 30, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 30, 2014

Management: Field office and laboratory management resources are challenged with a number of significant efforts:

- Operations at the Plutonium Facility remain mostly paused due to criticality safety and conduct of operations issues. The war room is expected to support seven day a week efforts to resume a large number of fissile material operations before the end of June 2014.
- LANL continues to maintain its war room for Area G and has separately appointed a recovery manager to organize efforts to investigate the hazards of the nitrate salt wastes and support safe recovery both locally and at the Waste Isolation Pilot Plant.
- Weapons Engineering Tritium Facility management has a task force underway to resolve operability issues with the Oxygen Monitoring System that have lingered since October 2013. Operability is required to restart tritium gas handling activities necessary for risk reduction efforts that have been dormant since 2010.
- Chemistry and Metallurgy Research building management is working through closure of 29 pre-start items in order to commence nuclear operations for the Confinement Vessel Disposition project.
- Management has initiated an investigation of a fire event and associated response at the LANSCE accelerator facility. Though not a defense nuclear facility, this event touches on several safety management programs that impact the entire site (e.g., fire protection, conduct of operations, and maintenance).

Area G–Nitrate Salt Waste: Area G personnel completed the relocation of the unremediated nitrate salt drums into the Dome 231 Permacon. All known nitrate salt drums at LANL are now located in Permacons. Chemistry and Weapons Experiments division experts have also initiated an experimental program to gain an understanding on the potential formation of energetic materials involving the nitrate salts, wheat-based kitty litter, nitric acid, and a neutralizing agent that were utilized as part of the remediation process.

Fire Protection: Last month, the field office transmitted to LANL management the results of a triennial assessment of the Fire Protection Program. Overall, the field office determined that three of six objectives were met and identified 15 findings and 20 observations for corrective action. Findings of particular interest include the following: the Fire Protection Program does not appear to have adequate resources to maintain a compliant program; fire protection engineers are not part of formal structured training plan to improve and maintain necessary job skills; reviewers continue to find many repeat issues from previous triennial assessments; a mechanism has not been implemented to ensure fire protection requirements are properly incorporated into new design and construction projects; corrective maintenance does not support timely restoration of impairments; the Radiological Laboratory Utility Office Building does not meet or exceed applicable building code; certain glovebox fire suppression systems are not UL-listed or otherwise approved for Class A fires; the baseline needs analysis has not been updated since 2009 contrary to the three year update requirement; and pre-incident plans do not contain all of the necessary information to support timely and effective response.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 6, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 6, 2014

DNFSB Staff Activity: On Wednesday, the Site Representatives and DNFSB Headquarters staff held a discussion at Sandia National Laboratories with the lead of the Department of Energy's (DOE) Technical Assistance Team for the Waste Isolation Pilot Plant recovery effort. On Thursday, Headquarters staff conducted a teleconference with field office and LANL personnel regarding emergency response planning for the nitrate salt wastes.

Area G–Nitrate Salts: LANL management announced they will not complete the 3706 Campaign on schedule and are working to relocate all remaining campaign wastes (i.e., combustible and dispersible forms) into Dome 230 for storage under fire suppression. In addition, Area G management suspended all legacy transuranic waste repackaging, treatment, and remediation activities. This suspension excludes drum venting, replacement of degraded components, non-destructive assay, and similar actions that improve the safety posture. On Wednesday, Area G personnel conducted a tabletop exercise involving the nitrate wastes that resulted in the identification of several important improvements. Area G and Chemistry Division personnel have also initiated development of a “safing” process to treat the nitrate salt wastes using a water addition followed by eventual cementation.

Plutonium Facility–Criticality Safety: On Wednesday, the field office unconditionally approved revision 3 of the Evaluation of the Safety of the Situation/Justification for Continued Operations (ESS/JCO) regarding the potential for criticality due to firewater flooding (see 5/23/14 weekly). The field office noted in their Safety Evaluation Report (SER) that the ESS/JCO is to be implemented by June 30, 2014, and that implementation will include: (1) evaluation of each applicable fissile material operation (FMO) in the context of firewater introduction as a credible abnormal condition, (2) evaluation to ensure that any new credible upsets beyond flooding (e.g., increased reflectivity from graphite) are analyzed, and (3) the criticality controls, procedures, and postings are updated accordingly. The SER notes approval of the ESS/JCO expires on May 30, 2015, and that the termination condition for each FMO is the development and implementation of an updated process-specific criticality safety evaluation that addresses both firewater and seismic induced upsets. Program personnel have initiated implementation efforts with the first Implementation Verification Review expected to occur as early as this weekend.

Contract Management: Last week, LANL transmitted to the field office for approval a revised implementation plan for DOE Order 420.1C, *Facility Safety* (see 12/20/13 weekly). DOE issued this version of the Order on December 4, 2012. LANL's revised plan projects implementation of the last action by end of September 2016 with the next updated probabilistic seismic analyses to occur by September 2018.

Confinement Vessel Disposition (CVD) Project: This week, LANL transmitted a letter to the field office indicating closure of all pre-start findings from the CVD Operational Readiness Review and requesting Startup Approval Authority to commence CVD operations. CVD personnel plan to transport and receive the first confinement vessel from TA-55 next week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 13, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 13, 2014

DNFSB Staff Activity: J.C. McComb observed resumption activities at the Plutonium Facility. D.J. Campbell performed site familiarization activities. On Wednesday and Thursday, R.K. Verhaagen observed causal analysis activities performed by the DOE Accident Investigation Board for the radiological release event at the Waste Isolation Pilot Plant.

Area G–Operations: On Friday, Area G management paused all transuranic waste movements until a safety stand-down briefing is completed next Monday. Observations by NNSA Facility Representatives indicating procedural adherence issues, including improper response to a dropped Standard Waste Box, triggered the stand-down.

Plutonium Facility–Criticality Safety: Facility and program personnel entered a period of high tempo of activities in support of resumption. During the past week, personnel conducted a total of at least 12 Annual Operating Reviews and Independent Verification Reviews.

Confinement Vessel Disposition (CVD) Project: On Tuesday, the field office granted LANL approval to commence CVD nuclear operations. On Wednesday, CVD personnel successfully transferred the first sphere from TA-55 to Wing 9. CVD personnel anticipate commencing cleanout activities next week.

Weapons Engineering Tritium Facility (WETF): On Wednesday, WETF management briefed the field office on the status of task force activities associated with the Oxygen Monitoring System (OMS). Management reported that procurements were underway for new sensors, cables, and modules and that testing was scheduled to be completed by July 2, 2014. Based on those actions, management anticipates submitting a revised Evaluation of the Safety of the Situation/Justification for Continued Operations (ESS/JCO) to the field office by July 14 and commencing contractor readiness activities by July 21. Field office management reiterated their skepticism regarding any attempt to declare the OMS operable without a successful 30-day demonstration. The Site Representatives note that an approved ESS/JCO does not exist for the potential inadequacy of the safety analysis declared on the OMS in November 2013 (see 11/29/13 weekly). In some instances, LANL's approach of combining a JCO with the ESS tends to result in delayed submittals.

Emergency Management: LANL recently issued the after-action report for the April 17, 2014, nuclear criticality exercise at TA-55 (see 4/18/14 weekly). The report notes four findings and seven opportunities for improvement (OFI) to be screened for potential corrective actions. The OFIs include:

- Operations in the Facility Incident Command (FIC) lacked formality, including personnel not following checklists, providing sporadic briefings, and confusion with seating and phones
- At least 12 individuals walked past injured victims without offering assistance
- Radcon technicians were not wearing proper personnel protective equipment (PPE)
- The FIC did not provide timely PPE advice to fire department, which delayed response to patients
- Emergency Management did not receive timely notification of the event
- The TA-55 Operations Center does not have a comprehensive phone list for the FIC

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 20, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 20, 2014

Area G–Nitrate Salt Wastes: This week, Area G personnel completed the relocation of all remaining 3706 Campaign transuranic wastes (i.e., combustible and dispersible) into Dome 230 for storage. Dome 230 is equipped with a fire suppression system.

On Wednesday, Area G personnel conducted an emergency exercise involving the remediated nitrate wastes currently stored in the Dome 375 Permacon. The scenario was supposed to involve an operator that was surprised by contacting a high temperature Standard Waste Box (SWB) and subsequently trips and is rendered unconscious, while a second operator observes and reports evidence of smoke and fire from the SWB. A key controller failed to inject evidence of smoke and fire from the SWB, reducing exercise effectiveness. Consequently, the event did not trigger an Operational Emergency status resulting in several significant exercise objectives that could not be evaluated.

Last Friday, LANL submitted to the field office the Evaluation of the Safety of the Situation (ESS) for the Potential Inadequacy of the Safety Analysis regarding waste drums containing remediated nitrate salts (see 5/16/14 weekly). The ESS argues that immediate actions and compensatory measures put in place, primarily overpacking and monitoring the wastes in SWBs, provides a safe configuration until a path forward for disposition is developed and implemented. Specifically, the ESS assigns a damage ratio of 0.1 to the overpacked drums in SWBs for a fire in accordance with DOE-STD-5506. This damage ratio is used to mitigate the consequences to the public from a postulated fire involving all remediated nitrate salt drums in SWB overpacks in the Dome 375 Permacon from 10.6 to 1.06 rem. DOE-STD-5506 cites engineering judgment as the technical basis for this damage ratio.

Emergency Preparedness: On Thursday, LANL conducted a functional exercise of the Emergency Operating Center. The scenario for this exercise was a seismic event that resulted in the collapse of two wings and a fire at the Chemistry and Metallurgy Research Building and a partial collapse of the Plutonium Facility. The exercise also challenged communications by simulating the loss of landlines and saturation of cell phones. LANL's Emergency Response Organization, the Los Alamos County Fire Department and Emergency Management personnel, LANL's Media Center, and the field office were full participants in the exercise. Exercise notifications were made to the New Mexico Department of Homeland Security and Emergency Management and to the DOE Forrestal Watch Office. Field operations were simulated through a concurrent tabletop exercise. Although a full critique of the exercise has not been completed, during the hot wash potential improvements to communications between the emergency directorate and support section personnel were identified.

Weapons Engineering Tritium Facility (WETF): On Tuesday, WETF personnel completed a multi-day evolution to package 112 legacy items containing tritium into a Flanged Tritium Waste Container (FTWC) for disposal at Area G. These items were identified during the hands-on inventory completed earlier this year (see 1/24/14 weekly) as a subset of over 1100 legacy items requiring disposition from WETF. This is the fourth FTWC packaged for disposal at Area G and represents another step forward in the legacy item disposition project.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 27, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 27, 2014

DNFSB Staff Activity: This week, D. Kupferer assisted the Site Representatives in oversight of resumption activities in the Plutonium Facility. On Wednesday, the staff conducted a teleconference with Plutonium Facility and field office personnel to discuss the implementation of criticality safety controls.

Area G–Nitrate Salt Wastes: This week, Area G personnel sampled an empty parent nitrate waste drum and provided briefings to the DOE Technical Assistance Team (TAT). LANL personnel reported that more than 700 experiments have been conducted to-date. LANL senior management has released some of these results to the TAT and Accident Investigation Board. On Tuesday, the Associate Director for Environment Programs appointed a team to perform a causal analysis to evaluate processing problems that resulted in a potentially non-compliant drum at the Waste Isolation Pilot Plant. The team will out brief results by July 31, 2014.

Radioactive Liquid Waste Treatment Facility: Facility personnel commenced operations of the Waste Mitigation Risk Management tanks for storage of low-level radioactive liquid influent (see 1/4/14 weekly).

Plutonium Facility–Criticality Safety: A year ago today, the LANL Director Paused programmatic operations in the Plutonium Facility due to concerns with criticality safety and conduct of operations. In order to commence fissile material operations, program personnel must complete: (1) the resumption process culminating in release by the LANL Director or designee, (2) an Implementation Verification Review, if the operation falls under the Justification for Continued Operations, and (3) screening for applicability, and completing as necessary, a readiness review. As of today, Plutonium Facility personnel could not provide specifics on the numbers of operations that had completed each of these three steps and executed operations with fissile materials, but they expect to release refined resumption metrics next week.

Plutonium Facility: Last week, during a routine inventory, Plutonium Facility personnel discovered a tank believed to be empty that actually contained approximately 50 liters of a solution with a low plutonium concentration. The solution was generated and transferred to this tank during aqueous operations required to place the facility in a safe and stable configuration (see 3/17/2104 weekly) and was intended to be cemented for disposal. Multiple previous inventories failed to identify the location of the liquid due to the site glass being completely full. During this inventory, a slight change in color of the solution made its presence detectable. Plutonium Facility personnel critiqued the event and determined that the procedure and processes used to dispose of this solution did not contain sufficient detail or require the necessary formality to ensure operators were keeping track of all solutions and complete disposition of these wastes. Personnel significantly revised the procedure during the Director's pause to include direction that is more specific on how to account adequately for solutions.

Area G–Criticality Safety: This week, during an assessment of fissile material operations in Area G, facility personnel identified that they had not performed a criticality safety evaluation (CSE) for handling and storage of sealed sources. Personnel previously identified the need for a CSE for this operation in a May 2012 assessment, but they had not completed the CSE beyond draft form due to competing priorities. Facility management conducted a critique of the event and discovered that operators relied upon informal guidance from criticality safety personnel to control the mass of sources brought into Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 4, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 4, 2014

Plutonium Facility–Criticality Safety: On Monday, the field office transmitted a letter to LANL requesting a status update associated with the resumption of programmatic activities. The field office noted that in accordance with DOE Order 425.1D, *Verification of Readiness to Startup or Restart Nuclear Facilities*, activities that have not resumed by June 27, 2014, may represent an extended shutdown and therefore could require readiness reviews prior to restart. The field office requested by July 14, 2014, a list of programmatic fissile material operations that: (1) resumed as of June 27, 2014; (2) LANL considers in extended shutdown; and (3) did not resume as of June 27, 2014, but that LANL does not consider in extended shutdown. For those operations that LANL does not consider in extended shutdown, the field office requested a detailed discussion of the rationale for this conclusion.

On Tuesday, the field office received a copy of the LANL Director's memo dated June 18, 2014, delegating resumption release authority for all remaining programmatic operations to the Principal Associate Director for Weapons Programs. The scope of this delegation excludes electrorefining, casting, and aqueous processing.

Also on Tuesday, program management informed the Site Representatives that program personnel would begin to place turnings and small pieces of plutonium metal into water resistant containers during the next few weeks. LANL's approved analysis in the Justification for Continued Operations demonstrates that accumulations of these materials in quantities greater than 500 g can result in a criticality, thus a water resistant container is required. Currently, multiple locations in the facility do not meet this requirement and do not have other compensatory measures implemented to ensure safety until these materials can be repackaged to comply with the Justification for Continued Operations controls.

RANT Shipping Facility–Fire Protection: On Tuesday, RANT management declared a Potential Inadequacy of the Safety Analysis (PISA) regarding fluctuations in the pressure of the firewater supply. As part of a lab-wide assessment on fire water supply, field office personnel obtained the results of system pressure monitoring performed by the Utilities and Institutional Facilities division and completed in April that indicated multiple instances during work hours where the water pressure dropped below the minimum specified in the Technical Safety Requirements (TSR). RANT encountered a similar issue in 2012 when pressure fluctuations in the firewater supply (see 8/3/2012 weekly) occurred whenever the facility toilet was flushed. Reportedly, the results of this monitoring were provided to RANT personnel; however, PISA related actions were only initiated after field office action on June 18. The field office assessment also preliminarily identified issues with maintenance and control of pressure reducing valves in the water supply, including a concern as to whether LANL was maintaining components supplying water to a nuclear facility fire suppression system with the appropriate consensus standard (National Fire Protection Association or American Water Works Association).

RANT management conducted a critique and determined that no compensatory measures were necessary with the facility currently in cold standby mode. The only other outcome was to execute the PISA process and determine whether TSR changes would be required. The Site Representative notes that critique participants did not bring the pressure data nor other related procedures or documentation and performed only a cursory effort to gather facts or otherwise discuss the apparent related issues.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 11, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 11, 2014

DNFSB Staff Activity: D. Campbell augmented the Site Representative office and performed cognizant engineer familiarization activities. He and the Site Representatives walked down the Weapons Engineering Tritium Facility, the Chemistry and Metallurgy Research Building, and the Plutonium Facility.

Plutonium Facility–Safety Basis: Late last month, the field office approved LANL’s request to extend the expiration date of three safety basis documents. The documents include a temporary modification involving fire rated containers from 2012, an Evaluation of the Safety of the Situation/Justification for Continued Operations (ESS/JCO) for refueling activities from 2012, and an ESS/JCO associated with ammonium nitrate in the ventilation ducting from 2010. The field office notes that implementation of the 2013 safety basis will close these documents and that implementation of the 2013 safety basis is currently scheduled to be completed by May 31, 2015.

The Site Representatives note the importance of executing timely annual updates to the safety basis in order to minimize confusion regarding the safety basis. For example, the safety basis document list for the Plutonium Facility currently indicates that in addition to the Documented Safety Analysis and Technical Safety Requirements, 13 sets of documents (including submittals, associated field office approvals, and extensions) are currently implemented. These documents sets include 10 ESS/JCOs, 2 temporary modifications, and the seismic addendum.

Plutonium Facility–Seismic Safety: Last week, LANL transmitted to the field office a progress report on seismic/structural upgrades for the Plutonium Facility. The report provides status of progress made on achieving milestones in the FY14 Project Execution Strategy for facility upgrades, as well as new scope added to the strategy as additional FY 2014 funds became available. Progress on all milestones are either on track or ahead of schedule. Notable 2014 accomplishments include completion of:

- Vault column modifications to correct captured column structural deficiencies
- Attic fire suppression seismic modifications
- 106 out of 122 identified non-standard fire suppression seismic modifications
- Facility corridor fire suppression seismic modifications
- Basement standard fire suppression seismic modifications
- 90% design for modifications to improve shear capacity of interior roof girders

Additional milestones to the execution strategy for FY14 include completion of:

- Anchorage upgrades for uninterruptable power supply automatic transfer switches
- Anchorage upgrades for electrical distribution system unit substations
- Installation of seismic upgrades for bleed-off ductwork
- Anchorage of basement flammable material storage cabinets

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 18, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 18, 2014

DNFSB Staff Activity: Deputy Technical Director R. Tontodonato performed his annual observation of site representative operations.

Transuranic Waste Facility (TWF) Project: Last Thursday, the NNSA Deputy Administrator for Defense Programs provisionally granted the project Critical Decision 3, *Approve Start of Construction*. The provision requires approval of an updated safety design strategy, which project and field office personnel expect to complete shortly. The project team also issued a lessons learned report for development of the preliminary documented safety analysis. Among the numerous suggested procedure changes include actions to formalize management involvement in the comment resolution process, promote effective communication with the field office by documenting results of project team interactions, and document expectations that safety basis personnel work directly for the project engineering manager.

Plutonium Facility–Safety Basis: On Tuesday, the field office approved the 2014 annual update to the safety basis. This update was minimal and primarily included a previously directed action regarding changes to the technical safety requirements. The field office expects LANL to implement the 2014 update with the 2013 update by May 31, 2015 (see 7/11/14 weekly).

Plutonium Facility–Criticality Safety: On Monday, LANL submitted a response to the Field Office's request for a status update associated with resumption of programmatic activities (see 7/4/14 weekly). LANL's response identified three resumption status bins including operations that were: actively resumed as of June 27, 2014; in extended shutdown and require a formal readiness assessment for restart; and not resumed by June 27, 2014, but not considered in extended shutdown and as such do not require a formal readiness assessment for restart. NNSA headquarters personnel were onsite to assist the field office in assessing compliance of the proposed submittal with DOE Order 425.1D, *Verification of Readiness to Startup or Restart Nuclear Facilities*.

Plutonium Facility–Work Control: During a walk-down of operations, NNSA personnel raised questions that resulted in the pause of two jobs. In one instance, fissile material handlers were in the process of loading containers of enriched uranium into a safe posted as an abnormal operating condition due to a suspected criticality deviation. The safe had been posted since August 2013 and after review at that time was determined to represent a level 5 infraction due to discrepancies with the dimensions. Management held a critique of the event and discussed a number of areas for improvement including failure to execute the recovery plan from the infraction, confusion on work authorization and release mechanisms, posting accuracy and effectiveness, and conduct of operations issues. The Site Representatives note that critique effectiveness improved from clearly presenting appropriate documentation to the entire audience.

Confinement Vessel Disposition Project: Chemistry and Metallurgy Research Building personnel moved the first confinement vessel into the Wing 9 enclosure in preparation for cleanout. Once inside the enclosure, personnel paused the activity to allow a procedure change necessary to replace improperly sized rigging equipment that had been previously installed.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 25, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 25, 2014

Area G–Nitrate Salt Wastes: On Monday and Tuesday, members of the DOE Waste Isolation Pilot Plant (WIPP) Technical Assistance Team and the Accident Investigation Board conducted a workshop to review the hypotheses and research efforts that LANL personnel have completed regarding the radiological release event at WIPP.

Criticality Safety: Last Friday, LANL transmitted to the field office their revised plan for the *Nuclear Criticality Safety Upgrades Project* (see 4/25/14 weekly). The project plan contains several hundred actions and indicates completion in October 2016.

RANT Shipping Facility–Safety Basis: Last week, the field office conditionally approved the 2013 Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR). The conditions include within 45 days: (1) removing all references of the TRUPACT III capability; (2) designating vehicle barriers between the facility and adjacent parking lot as defense-in-depth; (3) designating vehicle barriers protecting the container storage area as safety significant features; (4) correcting inconsistencies for the fire suppression system and water supply system throughout the DSA/TSR; (5) ensuring consistency throughout chapter 4 of the DSA with respect to safety system functions, and functional requirements, and performance criteria; and (6) revising chapter 7 to reflect new organizational names. The field office further directed implementation of the DSA/TSR within 90 days. Implementation of this DSA/TSR will move RANT from its status as a limited life facility to recognition of its status as the enduring transuranic waste shipping facility for the laboratory.

Continuous Improvement: Last week, the field office requested that LANL formally submit a sustainment plan for safety culture by August 27, 2014. The plan is to include a list of tools, their descriptions, and the plan and schedule to implement the tools. In addition, the field office invited a LANL participant to attend a NNSA-HQ sponsored safety culture workshop to be held in early August at the Nevada Field Office.

Plutonium Facility–Criticality Safety/Conduct of Operations: Last week, facility personnel identified material stored in a glovebox that did not comply with newly posted criticality safety limits. In this case, plutonium metal turnings in excess of 500 grams were being stored in non-watertight containers contrary to the posting derived from the controls specified in the Justification for Continued Operations (see 7/4/14 weekly). During an Annual Operational Review two weeks prior, with different criticality limits posted, it was noted that the contents of the glovebox did not comply with the limits established in the Justification for Continued Operations and that action would have to be taken to package the material prior to posting the new limits. During a critique of the event, operations personnel reported that subsequent to the AOR they incorrectly concluded that an informal analysis performed by a criticality safety analyst to show the condition in the glovebox was currently safe was sufficient to allow them to violate the posting. As a result, the glovebox was posted with the new controls in a known infringed condition.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 1, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending August 1, 2014

Emergency Preparedness: LANL hosted its annual HAZMAT Challenge this week with 13 teams participating, including five from local entities that LANL may call upon for aid in the event of an emergency. All eight of this year's scenarios were based on a postulated seismic event.

Plutonium Facility–Criticality Safety: On Thursday, the field office responded to LANL's summary of resumption status and proposed readiness activities (see 7/18/14 weekly). The field office concurred with the list of activities that LANL considered in extended shutdown and require a formal readiness assessment for restart, but directed that readiness activities be performed for the activities that LANL considered to not be in extended shutdown. Using LANL's groupings of activities, 14 are actively operating, 12 will require federal readiness assessments, and four will require contractor readiness assessments.

On Tuesday, Plutonium Facility management reported that personnel have replaced 38 of 58 legacy wooden housekeeping filters with new metal versions, including 19 with new "rain caps" to prevent intrusion of water. This work continues on schedule and significantly improves the safety posture of the affected gloveboxes.

Plutonium Facility–Conduct of Operations: In response to issues identified by NNSA personnel (see 7/18/14 weekly), Plutonium Facility management directed that all program managers are to perform at least two management observations on the work floor each week. One observation is to focus on work within the workgroup and the other on an outside workgroup.

Confinement Vessel Disposition (CVD) Project: Late last week, CVD personnel paused work during an evolution to sample and vent the atmosphere within the sphere when they unexpectedly found the sphere to be under vacuum. Procedure changes are underway.

Area G–Safety Basis: On Wednesday, the field office approved the Evaluation of the Safety of the Situation (ESS) for the new information concerning the nitrate salt waste (see 5/16/2014 weekly). However, the field office disapproved LANL's revision of the ESS that provided for changing out the vent plugs in the Standard Waste Boxes. The ESS expires within one year.

Also on Wednesday, the field office approved LANL's request to delay submittal of the revised safety basis to February 20, 2015, from August 1, 2014. The safety basis revision will address field office directed actions (see 8/2/2013 weekly), including elevating aspects of safety management programs to Specific Administrative Controls and re-evaluating the selection of credited controls using the hierarchy of controls.

RANT Shipping Facility: On Tuesday, LANL submitted a letter to the field office indicating that they have determined a TRUPACT III loading function is no longer required. LANL also indicated that no changes were required to institutional procedures to ensure major modification determinations were performed early in the design process and readily visible to federal oversight (see 12/13/2013 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 8, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending August 8, 2014

DNFSB Staff Activity: Staff members C. Berg, D.J. Campbell, R.T. Davis, M.W. Dunlevy, and M.M. McCoy conducted a review of the safety bases for Area G and the RANT Shipping Facility. A.H. Hadjian observed geophysical testing underway in support of the effort to update the probabilistic seismic hazard analysis. R.K. Verhaagen was on leave.

Plutonium Facility–Worker Safety: Earlier this summer, a programmatic operations group lead restricted use of a glovebox line used for thermal treatment of Pu-238 oxide powders after operators expressed concern about its material condition. The glovebox originated from the old DP Site Plutonium Facility and is at least 30 years old. Material condition concerns include multiple windows with cracked glass, gaskets taped and painted for unknown reasons, corroded water-filled shielding that has likely leaked dry, and significant amounts of abandoned in-place legacy equipment. Use of the glovebox line is essential for all Pu-238 products, including deliverables for the Office of Defense Programs. The group lead is working to resolve these issues.

The Site Representatives note that the current System Health Report for these gloveboxes does not capture most of these degraded conditions despite evidence the conditions have existed for many years. The report further indicates that all the gloveboxes are operable per the safety basis, which credits gloveboxes as safety significant with a performance criterion to maintain primary confinement of dispersible radioactive materials during process operations, upon loss of ventilation, and during or after performance category 2 seismic events. System engineers indicated that they believe these degraded conditions do not challenge the ability of these gloveboxes to perform this function, but had informed safety basis personnel on the need to provide greater engineering detail in the safety basis for this important safety system.

Plutonium Facility–Criticality Safety and Conduct of Operations: Last Friday, Plutonium Facility management directed that personnel execute most work-authorizing documents as Use-Every-Time documents irrespective of the approved level-of-use. In addition, the work authorizing documents are to be present on the floor with any references available within 15 minutes. On Thursday, LANL management provided a status of resumption activities to NNSA senior management.

RANT Shipping Facility: Last Thursday, LANL submitted to the field office the Evaluation of the Safety of the Situation (ESS) regarding the fluctuations in the firewater system pressure (see 7/4/14 weekly). The ESS argues that the facility is safe given the operational restriction of Cold Standby mode and indicates that additional investigation on the firewater system is required prior to proposing a path forward.

Area G–Safety Basis: Last Friday, LANL submitted the third revision of the ESS for fuel pool fires involving combustibles waste (see 3/28/14 weekly). The ESS considers a single drum of combustible waste in a fuel pool fire and establishes a control to limit receipt of drums at Area G to less than 80 Pu-239 Equivalent Curies. In accordance with the ESS, Area G personnel successfully over-packed the only existing combustible drum that exceeds this value on Wednesday. The ESS analysis does not examine multiple drums of combustible waste or other accident types.

Area G–Nitrate Salt Wastes: On Thursday, Area G personnel obtained samples of salt residues from the empty parent of the drum known to have breached at the Waste Isolation Pilot Plant.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 15, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending August 15, 2014

DNFSB Staff Activity: R.K. Verhaagen remained on leave and J.W. Plaué began leave Wednesday.

Plutonium Infrastructure Strategy: Late last month, the field office approved the Safety Design Strategy (SDS) for the new Plutonium Equipment Installation (PEI) sub-project of the Chemistry and Metallurgy Research Replacement project line item. PEI is one of two new subprojects included in a revised *Mission Need Statement* and a *Program Requirements Document*, which NNSA approved on July 3, 2014. The other sub-project is RLUOB Equipment Installation Phase 2 (REI2). PEI and REI2 constitute the first two phases of the Plutonium Strategy and are necessary to establish appropriate enduring analytical chemistry and materials characterization capabilities and capacities and to facilitate termination of programmatic operations in the existing Chemistry and Metallurgy Research building.

The PEI sub-project will repurpose several rooms in the Plutonium Facility by the removal of existing equipment and installation of new gloveboxes and associated equipment. The SDS notes the sub-project was screened against the criteria in DOE-STD-1189 and determined not to represent a major modification. The Chief of Defense Nuclear Safety concurred on the SDS and provided several comments for consideration, notably including the need to improve discussion on the challenges and the controls needed to perform PEI scope in an operating nuclear facility and the need to discuss anticipated demands of new equipment on the capacities of existing safety-related support systems.

Weapons Engineering Tritium Facility (WETF): Last Friday, LANL submitted to the field office the third revision of the Evaluation of the Safety of the Situation (ESS) for the issue associated with the Oxygen Monitoring System (OMS). The ESS was accompanied with the final report from the Root Cause Failure Analysis Team (see 6/13/14 weekly). The ESS asserts that the OMS can be declared operable based on a successful seven day calibration check, but proposes restricting tritium processing until completion of the first monthly as-found calibration check and completion of both the contractor and federal readiness assessments.

Startup and Restart: On Tuesday, LANL's Joint Evaluation Team (JET) convened to review the readiness review determinations for the restart of loading activities for UC609 tritium shipping containers at WETF and the restart of the TBase 2 lathe in the Plutonium Facility. The latter restart represents the first of likely ten upcoming readiness assessments to support full resumption of programmatic operations. The JET determined that both activities require federal readiness assessments pending approval by the field office.

Emergency Preparedness: LANL personnel recently issued the after-action report for the functional exercise of the Emergency Operations Centers (EOC) involving a significant seismic event (see 6/20/14 weekly). Overall, LANL met 76 of the 80 established exercise objectives with one finding and three objectives either not observed or applicable. The finding involved the lack of familiarity of one of the section chiefs with the EOC chain of command. EOC personnel investigated the issue and determined that the chief had not received either initial or refresher training. Additional follow-up revealed several other members of the Emergency Response Organization that were unfamiliar with basic EOC processes. Other notable opportunities for improvement include a field office identified issue to develop predetermined situational awareness information for display on the large electronic wall, the need for training on aspects of WebEOC, and the need to strengthen the conduct and physical arrangements for tabletop field play.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 22, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending August 22, 2014

DNFSB Staff Activity: E.M. Gibson observed geophysical testing performed in support of the update for the probabilistic seismic hazard analysis.

Field Office: The field office continues to experience difficulties maintaining adequate staffing. Currently, there are 21 federal employee vacancies. These vacancies include many key safety-related positions such as the Deputy Manager, Senior Technology Safety Advisor, Deputy Assistant Manager for Operations, Quality Assurance Manager, three Facility Representatives, and two capital project managers.

Plutonium Facility–Americium Recovery Project: Last week, LANL submitted to the field office a request for approval of the Plan of Action for a Contractor Readiness Assessment (CRA) to establish an americium-241 production capability in the Plutonium Facility. The chloride extraction and actinide recovery (CLEAR) line will recover americium-241 from waste streams that are newly generated or previously stored in the Plutonium Facility. One product of the CLEAR line process will be americium oxide that meets industrial customer specification requirements as directed by the DOE Office of Science. Americium oxide is used by the natural gas and crude oil well logging industry, as well as use in smoke detectors. LANL desires to commence the CRA in September 2014 pending approval of the request and successful completion of a Management Self-Assessment of readiness. Successful completion of the CRA would facilitate a Federal Readiness Assessment currently planned for November 2014.

Nuclear Environmental Sites: This week, a federalized project team successfully completed demolition of the two legacy water towers at TA-21 (see 4/25/14 weekly).

Transuranic Liquid Waste Subproject: Last week, the field office disapproved revision 3 of the Safety Design Strategy for the project. Substantive comments included the need to provide a technical basis for the volumes of liquid to be treated and to clarify the material-at-risk values.

Weapons Engineering Tritium Facility (WETF)–Restart Activities: This week, LANL submitted to the field office an implementation plan (IP) for the conduct of the CRA to restart gas transfer operations at WETF. The field office previously approved a Plan of Action for the CRA that directed LANL to submit the IP prior to the start of the assessment. The CRA team will evaluate WETF readiness to perform gas transfer operations from the function tester glovebox to the load-in glovebox. Additionally, based on the time elapsed since the last gas transfer and function test operations, these previously authorized activities will be evaluated as well. The start date of the CRA is contingent on field office approval of the recently submitted Evaluation of the Safety of the Situation for the issues associated with the Oxygen Monitoring System (see 8/15/14 weekly). The IP notes that following successful completion of the CRA and a follow-on Federal Readiness Assessment, the scope of activities to be authorized will be limited to those operations necessary to maintain facility safety/operability and to disposition legacy nuclear material at risk.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 29, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending August 29, 2014

DNFSB Staff Activity: On Tuesday, a staff team discussed with the field office concerns with the safety bases for Area G and the RANT Shipping Facility. On Thursday, the staff team out-briefed the results of their review to field office and laboratory management.

Radiological Laboratory Utility Office Building (RLUOB): Last Thursday, LANL management authorized operations with radioactive materials. This Thursday, RLUOB received the first set of radioactive samples.

Plutonium Infrastructure Strategy: Last week, the Deputy Secretary of Energy approved reaffirmation of Critical Decision 1 for the Chemistry and Metallurgy Research Replacement facility project. The project now includes sub-projects for RLUOB Equipment Installation Phase 2 and Plutonium Facility Equipment Installation (see 8/15/14 weekly).

Plutonium Facility–Criticality Safety: Last Wednesday, program operations personnel conservatively questioned whether oil in their glovebox was covered by a provision for “cleaning liquid” on the posting. Criticality safety staff determined the oil was not sufficiently covered and management initiated an extent-of-condition review. The review concluded this week and identified 36 locations impacted by this condition and subsequently posted as out of service. Many of these locations had been through all steps of the resumption process. The path forward is to develop a technical basis to support a revised requirements document.

Emergency Preparedness: Last Thursday, LANL personnel conducted the annual full-scale emergency exercise. This year’s scenario involved an acetylene gas explosion and subsequent fire in Wing 5 of the Chemistry and Metallurgy Research building. The scenario included multiple trauma victims with radioactive contamination. The Site Representatives noted good self-assessment during the controller critique where LANL personnel identified exercise conduct concerns including an inadequate number of exercise controllers in key areas and insufficient preparation time with the scenario and evaluation criteria. From a performance side, the controllers discussed significant concerns with command and control and communications between response assets. For example, communications were poor between Incident Command and the Facility Incident Command. LANL personnel plan to issue an after-action report in early October. While field office personnel participated in the exercise, no personnel observed field play or the controller critique, though DOE Directives do not necessarily require it.

Following the exercise, the Site Representatives conveyed to managers that an over-reliance on simulation limited the benefits of field play. For example, though victims had been prepared with high quality *moulage*, fire department protocol prohibited transporting “unconscious” victim actors, who were permitted to walk from the scene around the outside of the building into the ambulances. Similarly, fire department constraints resulted in personnel not wearing breathing apparatus as expected for a fire involving radioactive material. In addition, the Site Representatives discussed the adequacy of provisions for handling contaminated patients when the limited capacity of the local medical facility is exceeded.

Weapons Engineering Tritium Facility (WETF): On Wednesday, the field office conditionally approved the Evaluation of the Safety of the Situation for the Oxygen Monitoring System (see 8/15/14 weekly). The field office directed WETF to perform three 31-day monitoring periods to demonstrate proper operation of the system prior to startup. The contractor readiness assessment is planned to commence on September 8.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 5, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending September 5, 2014

DNFSB Staff Activity: J.W. Plaue was on leave this week.

Environmental Waste Management Operations (EWMO): On Tuesday, the EWMO Facility Operations Director (FOD) paused all waste container movements in Area G, the RANT Shipping Facility, and the Waste Characterization, Reduction and Repackaging Facility. This pause followed a series of events dating back to May 2014 in which waste shipments were found to be inadequately performed. The specific occurrences that led the FOD to pause operations included two instances where a required surveillance was not performed prior to moving waste drums and two instances where the receipt inspection was improperly performed. The FOD has ordered an extent of condition review be conducted for all receipt inspections performed in these three facilities since April 2014, as well as a causal analysis to assist in determining necessary corrective actions.

Weapons Engineering Tritium Facility (WETF): On Wednesday, WETF management briefed the field office on the status of efforts to meet calendar year 2014 project commitments for disposition of legacy items containing tritium (see 10/4/13 weekly). Project personnel indicated that most commitments were on track to be met, including exceeding the goal for dispositioning simple solution packages, but that the commitment to complete upgrades to the load-in glovebox will not be complete until next calendar year due to delays in facility startup (see 5/2/14 weekly). These load-in glovebox upgrades are essential to disposition the bulk tritium gas in the facility which represents the majority of the legacy tritium inventory.

On Thursday, WETF facility operations personnel completed the Implementation Verification Review (IVR) for the Evaluation of the Safety of the Situation (ESS) for the oxygen monitoring system (see 8/29/14 weekly). Operations personnel expect to work through this weekend to complete corrective actions from the IVR for ESS implementation, declare the oxygen monitoring system operable, and perform necessary system modifications and testing. These actions are prerequisites for LANL to declare readiness for the Contractor Readiness Assessment of tritium gas transfer operations, scheduled to start Monday, September 8, 2014.

Plutonium Facility–Criticality Safety: Last week, the field office disapproved a LANL request to close a Potential Inadequacy of the Safety Analysis (PISA) declared in September 2011 (see 9/23/11 weekly) and the associated ESS. The PISA was declared due to the potential for backflow of plutonium-bearing solutions from process tanks, through piping, into a bulk nitric acid tank that resides outside the Plutonium Facility's credited confinement boundary, which presents both safety basis and criticality safety concerns. The field office letter disapproving the request cited an inadequate evaluation basis in the modified criticality safety evaluation as the reason for disapproval. Additionally, the letter stated that an extension of the ESS, which expired last Friday, will not be approved and the operation identified as the source for backflow will have to cease until such time that an operational readiness assessment is successfully completed. Finally, the field office letter noted that LANL's submittal of the request to close the PISA provides another data point in the increasing trend of inadequate quality submittals.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 12, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending September 12, 2014

DNFSB Staff Activity: A.H. Hadjian and E.M. Gibson observed field activities in support of an effort to update the probabilistic seismic hazard analysis. A.H. Hadjian also met with site personnel to discuss details associated with planned roof girder structural upgrades in the Plutonium Facility.

Continuous Improvement: On Thursday, the field office submitted to the NNSA Acting Associate Administrator a Safety Culture Sustainment Plan for the Los Alamos Site (see 7/25/14 weekly). The submittal combined separate plans from both the field office and LANL proposing safety culture sustainment tools to be approved by the Programmatic Secretarial Office with concurrence from the Chief of Defense Nuclear Safety. The submittal noted that LANL linked its safety culture process to the Voluntary Protection Program and will share common safety culture sustainment tools. Field office identified focus areas include: communications, employee involvement, inadequate staffing levels, and feedback and improvement. LANL identified focus areas include: leadership, organizational learning for performance improvement, and employee engagement.

Plutonium Facility–Readiness Activities: On Monday, program personnel commenced the management self-assessment for the Americium Recovery Project (see 8/8/2014 weekly).

Last Friday, the field office formally provided comments to LANL management regarding the Plan of Action (POA) for the T-Base 2 machining activity. This activity will be the first readiness assessment associated with the resumption process and consists of a single glovebox containing equipment used to machine plutonium metal. The field office directed LANL to: (1) expand the scope to include all safety management programs, (2) perform actual procedural evolutions using surrogate material or use of a cold line, and (3) recommended the POA include a review of Vital Safety System Assessments and System Health Reporting to ensure any previously identified issues have been tracked to closure. The revised POA is due by September 15, 2014. Program personnel currently anticipate commencing their management self-assessment later this month.

Weapons Engineering Tritium Facility–Readiness Activities: On Monday, LANL commenced their contractor readiness assessment for gas transfer operations (see 9/5/14 weekly). On Friday, facility management declared a Potential Inadequacy of the Safety Analysis after a readiness assessment team member from the Savannah River Site identified that the lower flammability limit for mixtures of hydrogen in air is reduced when argon is also present. The safety basis allows the use of argon for glovebox work. As an immediate action, management prohibited the use of argon.

Confinement Vessel Disposition (CVD) Project: CVD personnel continue the deliberate and methodical cleanout of the first confinement vessel of this project. On Monday, the Site Representatives observed the successful completion of the first bag-out of waste material from the CVD glovebox to an attached waste drum.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 19, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending September 19, 2014

Weapons Engineering Tritium Facility (WETF): On Friday, a LANL review team concluded the Contractor Readiness Assessment (CRA) of WETF operations (see 8/22/14 weekly). The stated purpose of the CRA was to provide a confirmatory review of WETF readiness to commence gas transfer operations in order to maintain facility safety/operability and to disposition legacy nuclear material-at-risk. This CRA followed the completion of two management self-assessments and an independent Red Team Review. During Friday's outbrief, the team noted that they had identified 19 prestart and 15 post-start findings representing weaknesses in WETF readiness. Notable findings include:

- Facility personnel were not effective in demonstrating the ability to properly plan, conduct, or respond to off-normal conditions during performance of an emergency exercise
- Facility component labeling nomenclature is inconsistent in the field and may compromise personnel and facility safety
- Operators failed to demonstrate procedure performance proficiency
- Technical issues and inaccuracies were identified in several procedures
- Management has not evaluated open issues (e.g., non-conformances, repair work orders, performance improvement action, etc.) for potential impact to facility and gas transfer operations
- Workers exhibited complacency with radiological control practices during the performance of procedures and the emergency exercise

The review team noted facility performance was insufficient to ensure gas transfer and associated operations could be safely and compliantly performed within WETF. Specifically, operational readiness was not demonstrated in the areas of management systems and safety culture, facility and equipment readiness, and conduct of operations. Additionally, the team noted that the findings and observations identified during the CRA indicate that additional work is required to achieve necessary standards of operational excellence.

Transuranic Waste Storage Facility Project: Project personnel commenced site ground preparation activities this week.

Plutonium Facility–Readiness Activities: On Thursday, facility management suspended the management self-assessment for the Americium Recovery Project after significant procedure and labeling issues were identified. Program personnel completed preparations for the management self-assessment on the T-Base 2 machining activity, which is planned to commence next week. Of note, program personnel acknowledged that modern criticality safety evaluation documents that fully comply with DOE Standard 3007 will not be completed to support the management self-assessments for either of the above startup activities. The current goal is to have these modern evaluations with any associated changes to equipment, postings, and procedures in place prior to the start of the CRAs.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 26, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending September 26, 2014

Federal Oversight: On Thursday, the Secretary of Energy requested a plan by November 14, 2014, to transition management of the contract for the legacy environmental cleanup work at LANL from NNSA to the Office of Environment Management.

Plutonium Facility–Safety Systems: Last month, a team from the DOE Office of Enterprise Assessments (EA) completed a review of the ventilation system and facility control system. During the review, the EA team questioned whether the facility surveillance procedure that implements the ventilation system functional test fully meets the technical safety requirement surveillance. Specifically the EA team challenged whether the system functional test procedure ensured “The injection of a simulated or actual signal as close to the sensor as practicable to VERIFY OPERABILITY, including required alarms, INTERLOCK(s), trip functions, and failure trips” as specified in the functional requirements of the documented safety analysis. Last week, following a series of discussions on the subject between the field office, LANL, and the EA team, the field office transmitted a letter to LANL requesting additional information. The field office directed LANL to (1) prove that the performance of the implementing procedure(s) meet the surveillance requirement and (2) provide evidence that the implementing procedure(s) demonstrate how performance of the surveillance requirement ensures that the functional requirements specified in the safety basis for the ventilation system and facility control system are being met. The field office requested this evidence, including any necessary revisions to the implementing procedure(s) and safety basis by September 29, 2014.

Plutonium Facility–Criticality Safety: Last month, one of the program groups completed a pilot demonstration to assist operators in complying with criticality safety requirements by posting printouts from the LANMAS database at the workstation. The current practice requires operators to obtain inventory information from a LANMAS workstation that is not necessarily in proximity to the workstation. This pilot was based on a perceived best practice from the Lawrence Livermore National Laboratory, where operators have successfully used printouts at the workstation for many years. The group leader noted that the use of the printouts served as a quick verification that the fissile material within a location complied with applicable limit. Nonetheless, the group did not recommend proceeding with the use of printouts, primarily citing concerns that operators may forget to update the printouts creating “audit traps.” Producing a printout would require one additional action in the already mandated procedure for LANMAS transactions.

Emergency Management: Last week, LANL issued their after action report from an August 2014 tabletop exercise involving response to contaminated patients. The report notes that all exercise objectives were satisfactorily met, but provides the following opportunities for improvement: (1) only a single LANL medical provider is authorized to perform hands-on assistance at the local hospital, (2) thresholds for respiratory protection and vehicle decontamination have not been established, (3) a memorandum of understanding (MOU) is not in place to ensure helicopter transport of contaminated patients to regional care centers with advanced trauma capabilities, (4) a MOU is not in place with Sandia National Laboratories to facilitate radiological control technicians for patients that may need hospital treatment in Albuquerque, and (5) wider participation should be considered for the DOE provided Radiation Emergency Assistance Center/Training Site. LANL personnel are evaluating the need for corrective actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 3, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 3, 2014

DNFSB Staff Activity: R.K. Verhaagen observed an Integrated Nuclear Planning workshop held at DOE Headquarters. The objectives of the workshop were to validate the projected mission set for LANL nuclear facilities, provide an update on plutonium operations, and provide an update on line-item facility projects.

Area G–Nitrate Salts: On Wednesday, as part of hazards analysis discussions, a chemist raised concerns about the efficacy of the instant temperature measurements on the lids of the Standard Waste Boxes to detect reliably the presence of elevated temperatures within the nested drums. Safety analysis assumed this temperature monitoring would provide sufficient indication of a potential reaction to protect operators who need to enter the Permacon environment to conduct rounds and take headspace gas samples. Recent modeling questioned this assumption by highlighting the insulation capabilities of the wheat-based kitty litter and cardboard drum liners. After hearing the concern, Area G management paused activities in the Permacon until work control documents were revised to include respiratory protection. Rounds and headspace gas sampling resumed Thursday evening.

Plutonium Facility–Safety Systems: On Monday, LANL submitted their response to the field office request regarding the Facility Control System (see 9/26/14 report). Field office personnel are reviewing the detailed response and are planning to meet with personnel from the DOE Office of Enterprise Assessments next week to discuss the path forward. In the response, LANL noted that the September 2013 version of the safety basis reflects an improved description of the systems and their relationship to the credited surveillance procedure.

Plutonium Facility–Worker Safety: Programmatic operations remain restricted in several plutonium-238 laboratories while the operations group continues to investigate and repair gloveboxes with material condition concerns (see 8/8/14 weekly). The group recently replaced several longstanding cracked glovebox windows. Post replacement inspection revealed damage to both layers of glass, contradicting previous assessments by the system engineers. Separately, the group identified a failed gasket on a spool piece attached to the only glovebox capable of bagouts in this area. The group identified this failure when the joint obviously failed a smoke test (i.e., considerable smoke passed through the joint into the glovebox). This condition likely contributed to several recent instances of unexpected contamination in this room. Radiation protection staff used tape to restore this joint temporarily to support an upcoming campaign of waste bagouts needed to reduce combustible loading. The group's investigation also revealed that several abandoned conduits and tubes that remain in communication with glovebox environments are only sealed with tape. The group is actively pursuing engineered solutions to all these problems. The Site Representatives note that LANL management has not considered any of these conditions significant enough to declare these safety significant systems as inoperable.

Transuranic Liquid Waste (TLW) Subproject: Last week, LANL transmitted to the field office revision 3.1 of the Safety Design Strategy. The revision addressed field office comments (see 8/22/14 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 10, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 10, 2014

DNFSB Staff Activity: D.J. Campbell and R.C. Eul reviewed work planning and control.

Management: On Monday, the TA-55 Facility Operations Director (FOD) assumed control of the Chemistry and Metallurgy Research (CMR) building. The move is intended to facilitate the transition of CMR operations to the Radiological Laboratory Utilities Office Building, which is also under the control of the TA-55 FOD. The Science and Technology Operations FOD absorbed the remainder of the facilities under the former Radiological Chemistry Operations FOD.

Emergency Management: Last month, division personnel completed a six-sigma improvement initiative regarding emergency response with a particular focus on incident command and control. The initiative revealed the following key barriers to achieving success: (1) the process is inconsistent, often informal, disjointed, leading to added complexity, (2) lack of credibility and cooperation, (3) lack of formality of operations, (4) unclear roles and responsibilities, (5) poor integration between responders, and (6) emergencies are not reported or are not reported in a timely manner. Improvement actions include the development and training to standardized response processes and building emergency plans, as well as development of a standard line of inquiry for notification of emergencies with associated metrics. The schedule to implement these and other corrective actions runs through early 2015.

Plutonium Facility–Worker Safety: Recently, the programmatic operations group leader for actinide processing began developing improvement actions for two cases in one of the aqueous processing laboratories of gloveboxes with degraded material conditions. In one case, the group believes there is a breached gasket or similar failure on a spool piece associated with a glovebox line to be used for americium-241 production. The group has been troubleshooting spurious contamination events near this spool piece since a worker received an uptake in March 2013. The spool piece is currently draped with taped plastic sheeting and a radiological work permit is required for work in the associated glovebox; however, this glovebox remains operable per the safety basis (see 10/3/2014 weekly). In the other case, an entire wall of legacy gloveboxes, including some that housed a former incineration process for plutonium-238 contaminated rags, contains degraded conditions that workers suspect has contributed to multiple contamination events during the past few years. LANL management does not currently have a plan to remove these gloveboxes in order to both eliminate the hazard and free up the considerable space for new programmatic work.

Plutonium Facility–Criticality Safety: Operators recently initiated efforts to repackage plutonium metal turnings into water resistant containers to achieve compliance with the approved criticality safety limit under the Justification for Continued Operations (see 7/4/2014 weekly). The repackaging delays resulted from three criticality safety infractions in one of the two locations that contain more than 500 g of turnings and competition for the operators' time, since the operators are essential to the ongoing effort to resume the T-Base 2 machining activity.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 17, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 17, 2014

DNFSB Staff Activity: J.W. Plaue was on leave this week.

Plutonium Facility–Readiness Activities: On Wednesday, a Red Team kicked off a review of Safety Management Program (SMP) implementation in the Plutonium Facility. The Associate Director for Plutonium Science and Manufacturing is sponsoring this review with the stated objective of assessing the functional implementation of SMPs for compliance gaps between regulatory drivers and Plutonium Facility implementing documents, as well as to evaluate field implementation. The team is comprised of an independent group of senior professionals with expertise in relevant disciplines and will accomplish its review primarily through document reviews, interviews, and field observations. The SMPs that will be reviewed include those identified in 10CFR 830, as well as additional SMPs credited in the Plutonium facility safety basis.

The approved evaluation plan indicates that a necessary outcome of the review will be an endorsement of each SMP's technical adequacy, formality of operations performance, and whether implementation supports moving to the next phase of the readiness process for the Plutonium Facility. For those SMPs that cannot be endorsed by the team, specific details of the compliance gaps are requested. In addition to evaluating the health of Plutonium Facility SMPs, the review results will be used to develop the scope of future Contractor Readiness Assessments (CRA) for Plutonium Facility resumption.

The field office approved the Plan of Action for a CRA to establish an Americium-241 production capability in the Plutonium Facility (see 8/22/14 weekly). Of note, the management self-assessment of this activity is currently suspended due to identified procedure and labeling issues (see 9/19/14 weekly). The field office approval letter noted that due to the timing of this CRA and identified issues during other recent readiness activities, additional scrutiny is necessary, in particular with ensuring the relevant SMPs and the implemented safety basis adequately support this activity.

Radiological Laboratory Utility Office Building (RLUOB)–Radiological Operations: This week, LANL briefed the field office on plans for near-term radiological operations in RLUOB. RLUOB radiological operations commenced on August 28, 2014, at the current material-at-risk limits specified in DOE-STD-1027 for a Radiological Facility. LANL intends to increase the material-at-risk limits from the current 8.4g to 38.6g of Pu-239 equivalent as allowed by NNSA's supplemental guidance to DOE-STD-1027. This increase is targeted to occur in July 2015 and will accommodate transition of some additional analytical chemistry capabilities from the Chemistry and Metallurgy Research Building to RLUOB.

Weapons Engineering Tritium Facility (WETF): WETF personnel reported satisfactory results for the second 31-day monitoring period of oxygen monitoring system performance (see 8/29/14 weekly). One additional satisfactory 31-day monitoring period is necessary to declare the system operable prior to startup. Facility personnel continue to work on corrective actions from the issues discovered during the recent CRA (see 9/19/14 weekly). The facility startup plan includes completion of a checklist CRA to verify corrective actions are effective prior to the federal readiness assessment currently scheduled to commence in December.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 24, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 24, 2014

DNFSB Staff Activity: On Tuesday, D.J. Campbell and R.C. Eul presented their observations on work planning and control to site management.

Field Office: On Monday, the field office reported to NNSA Headquarters the quarterly status on the Technical Qualification Program and associated staffing needs. The analysis, performed in accordance with DOE Order 426.1, *Federal Technical Capability*, indicates an overall staffing capability shortfall of 28. This shortfall includes two Senior Technical Safety Managers, four Nuclear Safety Specialists, six Facility Representatives, one Safety System Oversight engineer, and three Quality Assurance engineers. NNSA is currently allocating staffing based on the Capabilities Based Field Office model, which remains conceptual. As a result, the field office currently has only 11 authorized vacancies.

Emergency Management: Early this month, LANL issued the after action report for the annual full-scale exercise (see 8/29/14 weekly). Their findings included: (1) direct communication between facility incident command and the fire department was never established, (2) the Emergency Operations Center (EOC) was assumed to initially be habitable; however, modeling later showed it to be within the plume and protective actions were not re-evaluated, and (3) field office public affairs was not represented. They also identified 12 opportunities for improvement, including the following of note: (a) additional radiological controls experts should be trained as controller/evaluators, (b) the Emergency Manager needs to communicate protective actions using actionable geographical reference points rather than distances, (c) the full screen monitor in the EOC needs repair, (d) the EOC needs more than one information technology support person, and (e) Los Alamos Medical Center warrants improvements with training on protocols and communications between the decontamination room and emergency room.

Plutonium Strategy: Last Thursday, the NNSA Deputy Administrator for Defense Programs issued a memorandum to the Field Office Manager and LANL Director requesting an analysis to examine the potential to increase the radioactive material inventory in the Radiological Laboratory Utility Office Building (RLUOB) to up to 400 g of Pu-239 equivalent. The analysis is to consider RLUOB as a Hazard Category 3 nuclear facility and is to examine impacts on safety, cost, and schedule. The Deputy Administrator expects results within five months.

Confinement Vessel Disposition (CVD) Project: This week, CVD personnel completed cleanout and robotic wire brushing of the first confinement vessel of the project. Project personnel intend to perform activities to de-mate the glovebox and robotic arm, as well as performing neutron assay of the cleaned out sphere, prior to shipment to Area G for final processing for disposition.

Plutonium Facility-Resumption Activities: The Red Team review of Safety Management Programs (SMP) concluded Friday. The team reported 41 issues and concluded that the programs are generally technically sound, but require improvements in implementation. The most significant of the identified issues concluded that the criticality safety SMP required significant attention, in particular with the development of compliant criticality safety evaluations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 31, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 31, 2014

The Site Representatives participated in briefings at DNFSB Headquarters this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 7, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 7, 2014

Plutonium Facility–Seismic Safety: R. K. Verhaagen observed a meeting in Albuquerque of a Seismic Expert Panel charged by the field office to review two separate analyses of Plutonium Facility performance during a seismic event. The panel has been assembled to identify similarities and differences between LANL's existing structural analysis of the facility and an alternate analysis sponsored by NNSA as committed by the Deputy Secretary in his memorandum to the Board dated September 28, 2012. The panel is expected to issue a report in January 2015, addressing points of concern directly impacting the Plutonium Facility's seismic adequacy as well as other points of perspective. During this initial meeting the panel identified some significant differences between the results of the two analyses that they deemed appropriate for additional investigation to better understand the root of the inconsistencies. The panel expects to meet again in San Francisco during the first weekend in December to further their deliberations.

Plutonium Facility–Quality Assurance: Late last month, facility management declared two separate violations of the Technical Safety Requirements (TSR) associated with failures to properly execute limits on material-at-risk (MAR). The facility monitors MAR limit compliance using a software program known as MAR Tracker, which management declared implemented in the summer of 2011. A review of the facility's database indicates that at least 14 critiques concerning the implementation of MAR Tracker have been performed since that time, including four associated with TSR violations. Last month's violations appear to stem from Software Quality Assurance (SQA) issues between the beta and production versions of the software. Three previous critiques going back to June of 2013 identified similar concerns and included an action to formalize MAR Tracker data change management. Further, a TSR violation in April of 2012 resulted in an extent-of-condition review and an overall assessment on MAR Tracker implementation including SQA. Preliminary planned corrective actions for the current TSR violations include to: (1) ensure MAR Tracker is compliant with SQA requirements by December 15, 2014, (2) execute a plan to identify gaps in MAR requirements and MAR Tracker by December 1, 2014, and (3) conduct a SQA assessment on MAR Tracker led by an institutional expert by May 15, 2015.

Plutonium Facility–Safety Systems: On Tuesday, the field office responded with direction to LANL management regarding the Facility Control System issue (see 10/3/14 weekly). The direction is to revise the credited surveillance procedure to require injection of a simulated or actual signal as close to the sensor as practicable upstream from the FCS and to fully verify the interlocks, trip functions and failure trips of the ventilation system fans downstream of the FCS. LANL personnel are directed to execute this revised procedure within four weeks with a provision for field office personnel to shadow its performance.

Confinement Vessel Disposition (CVD) Project: This week, CVD personnel experienced two events where continuous air monitors alarmed during bag-off operations associated with the removal of the robotic arm. In both instances, personnel were using air-purifying respirators, and responded appropriately. Radiation protection personnel are reviewing the events and determining what additional actions and measures are required prior to resuming operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 14, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 14, 2014

Corrective Action Management–Nuclear Criticality Safety: In their December 6, 2013, response to the Board, NNSA highlighted a corrective action associated with the revitalization of the institutional Nuclear Criticality Safety Committee (NCSC). The response states that a goal of the NCSC is to “provide the necessary oversight to ensure issues are properly addressed and provide continual improvement of the program.” The LANL Director signed a new charter for the NCSC in March 2014 (see 3/28/14 weekly). The revitalized NCSC held their fifth monthly meeting this Thursday. Discussions included labeling requirements and a proposed revision to the infraction severity levels. The NCSC also discussed scheduling their first semi-annual briefing to the LANL Director, establishing a replacement external member, conducting the first operational walk-down, and beginning a review of the completion and effectiveness of corrective actions. Separately, the NCSC continues to work on developing their procedures, annual operations plan, and quarterly schedule.

Plutonium Facility–Nuclear Criticality Safety: On Wednesday, Plutonium Facility management reported to the Field Office that the plutonium metal turnings in excess of 500 g had been repackaged into water resistant containers in two of the three glovebox locations (see 7/4/14 weekly). This brings these locations into compliance with the Field Office approved Justification for Continued Operations.

Plutonium Facility–Safety Systems: In the facility, there are currently at least two glovebox lines containing windows with significantly degraded transparency. In one location associated with plutonium-238 operations, the opacity resulted years ago from an operator’s mistaken use of hydrofluoric acid for window cleaning. In the other location, the installed window glass appears to be incompatible with the chemical dissolution operations housed inside. The opacity of these windows prevents effective periodic visual inspection of these locations (e.g., combustible loading, criticality compliance, maintenance). Within both lines, only one glovebox in the second line remains in active service. Operations personnel are working to schedule window replacements.

Weapons Engineering Tritium Facility (WETF): This week, WETF management declared a Technical Safety Requirement (TSR) violation due to issues encountered during the conduct of the third and final 31-day monitoring period of Oxygen Monitoring System (OMS) performance (see 8/29/14 weekly). First, during re-assembly of an OMS cell housing for the Tritium Waste Treatment System (TWTS), a clamping screw broke off rendering the system inoperable. During the successive repair and testing, personnel failed to realize that delays had caused the required periodicity to be exceeded for the TSR surveillance on the OMS associated with the Tritium Gas Containment System (TGCS). When operations personnel discovered this discrepancy, they entered the appropriate Limiting Condition for Operations. During the critique facility personnel discussed issues with the processes used to control system operability when performing surveillances, operator confusion caused by the complexity of safety basis and procedure interaction, and tracking TSR completion. A causal analysis will be performed to better understand and fix these issues.

Plutonium Facility–Safety Basis: Last week, LANL submitted a revision of the Plutonium Facility safety basis to the Field Office for review and approval. Changes included increasing the material-at-risk (MAR) limits outside of the Plutonium Facility but within the boundaries of Technical Area 55 protected area to allow operation of the Transuranic (TRU) Waste High Efficiency Neutron Counter. LANL notes that although the MAR limits are increased, as the process to assay and ship TRU waste offsite is implemented, there will be a net reduction in MAR inventory at Technical Area 55 as a result. Additionally, the MAR limit for confinement pressure vessels stored outside of the Plutonium Facility has been reduced due to recent shipments of the vessels from the facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 21, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 21, 2014

Board Visit: This week, DNFSB Chairman Winokur and Vice Chairman Roberson visited the laboratory along with staff members R.E. Tontodonato and D.J. Campbell. The Board received briefings from site personnel and walked down several facilities, including the Plutonium Facility.

DNFSB Staff Activity: On Thursday, staff members P.J. Foster, E.M. Gibson, and R.L. Jackson reviewed the status of the Transuranic Waste Facility project. The staff team held discussions with field office and LANL personnel regarding worker safety, the construction schedule, and planned oversight activities. The staff team and Site Representatives also walked down the construction site for familiarization and training purposes.

Plutonium Facility–Configuration Management: On Thursday, program personnel declared a process deviation for nuclear criticality safety when an operator discovered about 30 L of unexpected liquid in a horizontal pencil tank array. Program and facility personnel conducted a fact-finding for the event and determined that management had posted the tank array out of service in 2007 because of concerns with wall thinning. In addition, operators last rewrapped the tank flanges, which contain the sight glasses, in 2009. The fact-finding participants were unable to characterize the liquid or determine a potential source, in large part due to the lack of an engineered piping diagram for this system. Corrective actions include the development of a plan to safely sample and relocate the liquid to robust tanks. Management also determined the need for an extent of condition review to examine other out of service tanks in the facility, since these do not currently receive any type of periodic inspection.

Plutonium Facility–Resumption Activities: Plutonium Facility management authorized the commencement of the management self-assessment for the Balance of Machining activities.

Emergency Management: This week, LANL personnel conducted Emergency Radiological Responder Training (ERRT) for a class of recruits for the Los Alamos County Fire Department. The initial ERRT consists of multi-day classroom instruction on radiation protection fundamentals, unique materials fires, ventilation system fires, and glovebox fires. The ERRT also includes drill evolutions covering establishing perimeters, contaminated patient handling, and doffing contaminated protective gear, in addition to a training evolution on glovebox firefighting. An evaluated drill evolution is required annually, which is particularly important because firefighters often simulate these actions during drills and exercises in the nuclear facilities. For example, firefighters typically simulate use of breathing apparatus because of staffing constraints associated with rehabilitation time and limited overtime for extra shift coverage. Similarly, firefighters typically do not handle actual people or anthropomorphic dummies during contaminated patient handling exercise scenarios due to safety concerns for the people and the firefighters. The Site Representative observed portions of the training and found it to be generally of high quality; however, he discussed with management an inconsistency with the staged graphite containers used in the glovebox firefighting training and the containers found in the Plutonium Facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 28, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 28, 2014

Plutonium Facility–Conduct of Operations: Last Friday, two workers entered a room under an active loss of ventilation alarm and proceeded to perform work in the restricted area for about an hour. At the time, the entire half of the facility they were working in was under restricted access in support of maintenance activities on the ventilation system. Management discovered their presence when one individual requested support after alarming a contamination monitor while surveying his head. During the fact-finding, personnel discussed issues with three barriers that should have prevented the incident. First, the workers heard the alarm, but did not recognize it and respond appropriately. Personnel noted that in recent years, the samples of the audible alarms were removed from the required facility access training. Second, communication of the status of the facility was insufficient. Specifically, postings and barriers were not placed at the appropriate locations to warn workers of entry into the wing. Third, work scheduling and release processes did not identify the conflict because the work activity was included in a generic work activity that is captured on the plan of the day as ongoing most days. Management tasked corrective actions associated with alarm training and improving communication of the status of the facility.

Emergency Management: On Monday, LANL personnel conducted an emergency exercise at the Weapons Engineering Tritium Facility (WETF). The exercise scenario involved a glovebox explosion and fire that injured and contaminated a worker. The Site Representatives noted good constructive criticism during the exercise hot wash with some of the more pertinent issues discussed including:

- Fire department response to the injured worker took more than 30 minutes, largely resulting from communications issues between the Emergency Operations Center, the Facility Incident Command (FIC), and the fire department.
- The fire department staged at a nearby firehouse and assumed the role of Incident Command prior to arriving on scene and without having received a status briefing from the FIC.
- The FIC initially determined that protective actions were unnecessary; however, the Incident Commander nearly an hour later declared a shelter-in-place for a 2100-meter box zone.
- Responders had trouble with the function and availability of radios and telephones.
- Personnel noted the lack of decontamination and monitoring equipment staged in locations outside of the main operating buildings that are typically evacuated in emergencies.
- Controllers provided inject information for facility-instrumented indications that used incorrect units and did not cover all relevant locations.
- WETF personnel indicated that they had identified many of these issues during previous exercises, but they remain unresolved.

The Site Representatives note that despite these fundamental issues, exercise personnel preliminarily determined that nearly all (~63 of 68) of the exercise objectives were met. This result strongly suggests that the exercise objectives are insufficiently challenging to effectively drive needed improvements. Examples of the objectives used in this exercise include: workers obeyed instructions, the FIC ensures 911 is called, the fire department establishes Incident Command, the Emergency Manager approaches the scene with care and uses the proper forms, and an exercise plan was developed. In contrast, not a single objective assessed the timeliness of the response or the correctness of protective actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 5, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 5, 2014

Plutonium Facility–Safety Systems: On Thursday, the facility returned to Operations Mode for the first time in three weeks following the successful completion of a revised surveillance test of the Facility Control System (see 11/7/2014 weekly) and multiple repairs to one of the credited diesel firewater pumps.

Plutonium Facility–Resumption: On Wednesday, LANL management decided to delay the start of the contractor readiness assessment for the T Base II lathe from next Monday to January. The decision was largely based on the need ensure that the controls from the new compliant criticality safety evaluations could be implemented and integrated into operating procedures.

Weapons Engineering Tritium Facility (WETF): Last month, WETF management issued a letter to the NNSA program manager providing the program plan for activities under the Tritium Legacy Project. The project aims to reduce the current inventory of tritium from about 220 g to less than 100 g in order to align the inventory with future programmatic needs. The letter indicates the project will take 5–7 years with bulk tritium gas shipments expected to occur in the first 4–5 years. The plan does not provide specific out-year milestones, but current fiscal year elements include facility restart, equipment and program upgrades, shipment of at least one AL-M1 molecular sieve to the Savannah River Site, and loading of at least one Flanged Tritium Waste Container. Also, late last month, WETF notified the Field Office of successful completion of the third month of required monitoring on the Oxygen Monitoring System (see 10/17/2014 weekly).

Area G–Quality Assurance: This week, Area G personnel identified two occurrences where the field conditions of material-at-risk (MAR) did not match what was contained in the quality records of the MAR tracking database used to ensure compliance with safety basis limits. Area G personnel monitor MAR limit compliance using a software tool known as the Waste Compliance and Tracking System (WCATS), which was implemented in August 2013. In the first instance, in an effort to overpack remediated nitrate salt waste drums into standard waste boxes, operators did not follow the normal processes and procedures for accounting of MAR. This resulted in the volume of waste recorded in the system exceeding the actual volume of waste in the facility. In the second instance, a waste drum was discovered that was not recognized by WCATS. During the critique of this event, Area G personnel identified that during a transition of MAR tracking databases this drum had a location code that was not captured in the new WCATS. Area G personnel declared a violation of the technical safety requirements and are conducting an extent of condition review to ensure that the issues with quality records for tracking MAR in Area G are isolated to these instances.

Area G–Safety Basis: On Wednesday, Area G management declared a Potential Inadequacy of the Safety Analysis (PISA) due to the discovery of an unanalyzed accident scenario in the safety basis. This PISA is focused on newly generated transuranic waste in 55 gallon drums because there are no controls in place to limit the combustible composition of the waste. The Board’s staff identified this issue during follow-up of a related PISA (see 3/28/14 weekly). During the new information process, analysts determined that multiple combustible drums involved in a fuel pool fire may not be bounded by the current accident analysis. As a result, management suspended receipt of newly generated 55 gallon drums in Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 12, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 12, 2014

Emergency Management: During the past weekend, LANL and field office personnel conducted a multi-day full-scale emergency response exercise involving several hundred people. While the scenario focused on a security event, the Site Representatives note a number of positive elements associated with the exercise conduct that could benefit future drills and exercises. In particular, exercise designers chose a scenario unique from those previously exercised and attempted to minimize simulation in several areas. For example, operators physically deployed unmanned aerial systems to provide video surveillance of the event and support personnel physically moved security barriers around the lab site. In addition, assurance personnel utilized about 30 video cameras, including some mounted to response personnel and controllers, to record interactions with the intent of ascertaining factual evidence for after-action analysis, as well as generating training materials. Finally, the exercise designers included greater emphasis on typically underplayed elements of the response, including a full mock press conference and about a day of recovery planning.

Plutonium Facility–Emergency Management: Last Thursday, the Nuclear Criticality Safety Division issued a memo providing a revised calculation for the Immediate Evacuation Zone for the facility. The results indicate the zone extends into the Operations Center necessitating its evacuation. However, the memo concludes that personnel may remain in the Operation Center provided that: (1) they acknowledge and accept the associated risk, (2) the radiation levels are acceptable, and (3) the presence is made with continuous radiation monitoring equipment. Facility personnel will need to implement the revised conclusion through updates to alarm and emergency response procedures, training, and drills/exercises. The Site Representatives note that an ideal solution would be to ensure facility indications are repeated to the Facility Incident Command center in the Radiological Utility Office Building. The Criticality Alarm System upgrade as part of the TA-55 Reinvestment Project includes some of this scope; however, recent efforts to reduce costs may put this functionality in jeopardy.

Weapons Engineering Tritium Facility (WETF)–Configuration Management: Last week, during performance of an integrated work document to replace relief valves on the WETF high and low pressure nitrogen systems, facility operators secured a facility ventilation fan due to an unexpected system response. Upon investigation, WETF personnel observed that the ventilation system inlet and outlet dampers for a WETF process room were inadvertently shut. The resultant pressure drop actuated a ventilation system differential pressure alarm causing operators to respond appropriately by securing the supply fan. During a critique of the event, WETF personnel identified that the ventilation system had been modified in 2006 to use the high-pressure nitrogen system to provide a motive force to pneumatically hold open the dampers. When the nitrogen system was tagged out for maintenance the motive force was lost and the dampers closed. The use of the nitrogen system to provide this function was an unauthorized modification made when decommissioning the Emergency Tritium Cleanup System and associated compressed air system. This modification was made prior to WETF personnel implementing a conduct of engineering program so there was no configuration control of the alteration. As a result, nitrogen and ventilation system drawings do not reflect the actual system configurations, associated procedures are not developed with this configuration in mind, and operators have not been trained on the modifications or the operational interfaces between these systems.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 19, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 19, 2014

DNFSB Staff Activity: J.W. Plaue was at the Lawrence Livermore National Laboratory (LLNL) this week to assist with a site familiarization visit by the new DNFSB staff LLNL cognizant engineer.

Plutonium Facility–Resumption Activities: This week, the field office approved a LANL request to remove the T-Base 2 machining operation from the scope of the Evaluation of the Safety of the Situation/Justification for Continued Operations (ESS/JCO) regarding the potential for criticality due to firewater flooding (see 5/23/14 weekly). The LANL request identified that all required actions established in the ESS/JCO approval letter necessary to remove the ESS/JCO compensatory measures had been completed. These actions included field office approval and LANL implementation of a comprehensive Criticality Safety Evaluation Document.

RANT Shipping Facility: On Wednesday, facility management declared a potential inadequacy in the safety analysis (PISA) for the RANT Shipping Facility. Safety basis personnel were following the new information process in response to an issue raised in the Board's December 9, 2014, report to NNSA detailing deficiencies in the facility's approved, but not yet implemented, Documented Safety Analysis (DSA). The Board's letter questioned whether the RANT Shipping Facility's seismic analysis demonstrates that the structure meets its credited seismic performance criteria. The same analysis is cited as demonstrating adequate seismic performance in the currently implemented Basis for Interim Operations. The LANL calculation supporting this analysis concludes that the facility does not meet its safety basis credited seismic performance. RANT engineering and safety basis personnel are evaluating this information through the Unreviewed Safety Question Determination (USQD) process. Today, the field office transmitted a letter to LANL rescinding approval of the DSA and directing the facility remain in cold standby until authorized by the field office to change modes.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF): This week, WCRRF personnel identified that a procedural change for processing waste in the WCRRF glovebox was made without an adequate USQD being performed. The procedural change was made over two years ago and removed the requirements to stop waste processing and inform management if, among other things, Class 1 oxidizers (such as nitrates), flammable metals or pyrophoric materials were encountered. The currently implemented Basis for Interim Operations does not allow processing of these types of materials. The WCRRF is in cold standby.

Confinement Vessel Disposition (CVD) Project: CVD personnel completed de-mating the robotic arm and glovebox workstation from the first processed confinement vessel (see 10/24/14 weekly). Port covers have been installed in place of the robotic arm and workstation. These actions followed procedural and process changes needed to enhance contamination controls within the enclosure when de-mating these items. The confinement vessel will remain in this safe configuration within the enclosure until the New Year when it will be assayed and shipped to Area G for final processing and disposition.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 26, 2014

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 26, 2014

LANL's annual winter closure began Wednesday evening with operations resuming on January 5, 2015.

Conduct of Engineering: Last month, LANL issued the report from a recent Parent Organization Functional Management Review. The review concluded that there has been significant improvement in the Conduct of Engineering since 2006 and noted seven noteworthy practices. Opportunities for improvement included the need for: (1) processes to support continuous improvement, (2) assignment of system engineers earlier in projects, (3) increased focus on configuration management, (4) safety basis awareness training for design engineers, and (5) a more focused effort to keep standards up to date. One of three additional performance feedback items noted that some engineering efforts performed in program groups have not fully embraced Conduct of Engineering and suggested bolstering this interface to ensure that activities that may impact safety bases are appropriately elevated.

Area G–Nitrate Salts: Area G personnel initiated a series of thermal tests to determine the rate of heat removal from a 55-gallon drum containing remediated nitrate salt wastes. The tests will utilize instrumented drums containing a surrogate mixture of wheat-based cat litter and a commercial ice-melt compound consisting of calcium and magnesium chlorides. A robust understanding of the cooling and warming rates is necessary to support the safety of the planned final treatment process, which will rely on temperature control to minimize heat generation from microbial species and slow chemical kinetics.

Plutonium Facility–Work Planning: Last Thursday, a group of eight workers, with five simultaneously working in gloveboxes, experienced a contamination event while performing corrective maintenance on the trolley in the plutonium-238 area. Radiological surveys identified greater than two million disintegrations per minute (dpm) in several locations in the room and on multiple areas of the coveralls of two individuals. One of these workers also had about 500 dpm on the skin. Overall, three workers started special bioassay. The continuous air monitor alarmed about 1.5 hours into the event; however, its filters and those of other fixed air samplers revealed only low levels of airborne contamination. Management conducted a fact-finding for this event on Monday where follow-up actions revealed a V-shaped tear about the size of a quarter in one of the gloves; however, potential causes of the tear remain undetermined. Other points discussed include the need for extra monitoring equipment, reinforcement of surveying following glove exit, and a request for continuous presence of a radiological control technician (RCT) during complicated trolley jobs. The participants noted excellent responses by the RCTs. The Site Representatives note that many of the RCTs in the facility, including the involved RCTs, recently conducted drills for similar scenarios as part of readiness preparation activities, which may have contributed to the strong response.

Plutonium Facility–Worker Safety: On Monday, the programmatic operations lead released restrictions on the plutonium-238 oxide thermal treatment line (see 8/8/14 weekly). The release comes after a significant improvement in the safety posture of these old gloveboxes, including the replacement of several compromised windows, engineered closure of previously taped openings, repairs to shielding, and correction of electrical safety issues.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 2, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 2, 2015

The Year on a Page: The key happenings of 2014 and a look at the year ahead as distilled by the Site Reps:

- The Field Office gained a permanent Manager; however, several key management and safety related positions remain vacant. LANL created a new Associate Deputy Director position and appointed a new Deputy Director, a new Principal Associate Director for Operations, and several new managers associated with transuranic waste operations.
- Plutonium Facility (PF-4) operations remain largely dormant 18 months after the LANL Director's pause stemming from criticality safety and conduct of operations issues. PF-4 personnel spent much of the last six months preparing for the expected 10 federal readiness assessments (FRA) required to restart the complete suite of programmatic operations. The first contractor readiness assessment (CRA) is set to begin on January 12, 2015, with the entirety of the restart effort planned to span the duration of the year.
- The PF-4 safety posture improved with the completion of reinforcements to eight vault columns and strengthened seismic anchorages to the fire suppression, electrical, and ventilation systems. The year 2015 is set to include planned reinforcements to the roof girders, additional safety system upgrades, and perhaps the completion of the alternative seismic analysis of the facility, which is currently stalled.
- In May 2014, photographic evidence revealed a transuranic waste drum originating from LANL contributed to the radiological release at the Waste Isolation Pilot Plant. Since then, LANL personnel have spent considerable effort investigating how processes failed and allowed nitrate salts to be mixed with wheat-based cat litter, how a chemical reaction initiated in this mixture and breached the drum, and how similar drums can be safely treated to rectify the situation. Treatment operations are likely to commence later in 2015; meanwhile, transuranic waste operations remain largely curtailed.
- Following nearly a year of troubleshooting the Oxygen Monitoring System, the Weapons Engineering Tritium Facility (WETF) conducted a CRA to restart gas transfer operations, which have not occurred since 2010 and are required to support risk reduction efforts. The CRA identified that facility performance was insufficient to support safe operations. In early 2015, WETF management plans to re-perform the CRA ahead of a FRA. In parallel, personnel continue to achieve minor gains in risk reduction through direct-discard of tritium contaminated legacy items into Flanged Tritium Waste Containers for disposal at Area G.
- After a period of uncertainty on the approach to terminate programmatic operations in the Chemistry and Metallurgy Research building by 2019, NNSA and LANL moved forward with the first two steps of the Plutonium Strategy. Facility work supporting these steps is to commence in early 2015.
- In June 2014, LANL closed all the pre-start findings from the October 2013 Operational Readiness Review for the Confinement Vessel Disposition project. Since then, project personnel successfully cleaned out the first of nine vessels. They plan to process another two in the remainder of fiscal year 2015.
- The Nuclear Criticality Safety Division gained a new manager, three new experienced analysts, and four new junior analysts. The Division issued about 100 new criticality safety evaluations in the past year and will need to generate several hundred more to support the full restart of PF-4.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 9, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 9, 2015

Plutonium Facility–Safety Systems: Late last month, LANL transmitted to the field office for review and approval the major modification determination for the Active Confinement Ventilation Upgrade Project (ACVUP). Based on feedback from the field office, LANL concluded that the ACVUP constituted a major modification to the safety basis. However, since the system’s safety function will remain to provide airflow via cascading differential pressures, LANL intends to submit a safety basis strategy at the end of this month that relies upon a graded approach. This will involve submittal of safety basis page changes developed against DOE-STD-1189 in lieu of a preliminary documented safety analysis. The ACVUP is a subproject under Phase III of the TA-55 Reinvestment Project with a pre-conceptual completion date of fiscal year 2024.

Also late last month, LANL transmitted a revision of the TA-55 Project Execution Strategy (PES). The PES serves to help integrate the scope, high-level schedules, and funding associated with the numerous capital and program-funded projects associated with actions necessary to reduce the mitigated offsite consequences from seismically-induced events to below the DOE Evaluation Guideline. The PES identifies the following scope for fiscal year 2015:

- Modify the sewer vent in the Bleed-off system to prevent the formation of ammonium nitrate on the ventilation system HEPA filters
- Seismic qualification for numerous replacement and spare components for safety systems
- Evaluation of options to equip gloveboxes with fire suppression in accordance with DOE and national consensus standards
- Modify the anchorages for various electrical and ventilation system components
- Improve the shear capacity of the interior roof girders
- Upgrade six stands of gloveboxes containing furnaces to meet Performance Category 3 requirements during the next two years

Emergency Management: On Thursday, LANL personnel conducted the annual emergency exercise at the Radioactive Liquid Waste Treatment Facility (RLWTF). This year’s scenario involved a postulated crash of a delivery truck carrying poisonous gas in the facility’s yard area. The event triggered an immediate facility evacuation to the outdoor muster point and response by the fire department and hazardous material team. This year, coordination of facility response was improved through an area-wide announcement transmitted from the TA-55 Operations Center alerting facility responders to assemble at the Facility Incident Command at the Radiological Laboratory Utility Office Building, which is down the block from RLWTF.

Plutonium Facility–Quality Assurance: This week, facility management declared another violation of a Technical Safety Requirement associated with material-at-risk (MAR) limits (see 11/7/14 weekly). In this instance, an extent of condition review revealed two locations that were not included in the MAR tracker database used to track limit compliance. Facility personnel attempted to correct the deficiencies in the database and to complete the required surveillance within 24 hours to maintain operability as allowed by the Documented Safety Analysis. Performance of the surveillance failed when MAR tracker was unable to process all necessary input data. As a result of the failure to complete this surveillance in the required time, normal facility operations had to be terminated. A causal analysis is being performed and the facility is implementing a configuration management plan to address MAR tracker software changes.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 16, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 16, 2015

Plutonium Facility–Restart Activities: On Monday, LANL commenced their contractor readiness assessment (CRA) of the T-Base II machining activity. The scope of the activity includes a single glovebox housing the lathe machine and a supporting glovebox and is conducted by two machinists and their first line manager. LANL management proposed using this activity to assess the health of the safety management programs. As a result, more than half of the CRA lines of inquiry are focused on these programs. The CRA is expected to conclude next week and will overall include about 70 interviews, a performance demonstration, and an emergency drill; the latter two occurred this week.

Plutonium Facility–Safety Systems: On Wednesday, a Plutonium Facility cognizant system engineer for the safety significant fire suppression system identified that a Technical Safety Requirement surveillance had not been performed as required. Specifically, sprinkler heads within two areas in the facility were not inspected to ensure they could function as required. In the first instance, maintenance personnel could not enter a laboratory room because they were unable to coordinate the Radiological Control Technician support required to enter the room with its existing contamination issues. In the second instance, maintenance personnel incorrectly interpreted the requirements and believed that sprinklers above the vault did not need to be inspected because they would need to access the top of the vault to examine the subject sprinkler heads. In both cases, the maintenance supervisor inappropriately determined that the areas were inaccessible and therefore the inspection of these sprinkler heads was not necessary to satisfy the surveillance. During a critique of the event, personnel determined that the subjectiveness of the term “inaccessible” in the procedure contributed to the misinterpretation.

Area G–Safety Basis: Safety basis personnel have yet to complete the Unreviewed Safety Question Determination (USQD) and the Evaluation of the Safety of the Situation (ESS) for the Potential Inadequacy of the Safety Analysis (PISA) associated with combustible waste composition (see 12/5/14 weekly). DOE guidance indicates that the USQD should be completed within “hours or days, not weeks,” though the LANL procedure specifies 15 days and includes a provision for extension. Similarly, DOE guidance indicates that the ESS should be completed “as soon as practicable and not take more than a month,” which LANL implements with a 30 day limit and provision for extension through the Field Office. In this case, the PISA was declared on December 3, 2014, and neither extension provision was executed. Timely issuance of the USQD and ESS is important because they provide the analysis necessary for the Field Office to determine whether the operational restrictions LANL imposed are adequate to ensure worker and public safety. During 2014, three of the five PISAs declared within this organization did not meet LANL’s expectations, including a similar PISA concerning combustibles declared about a year ago (see 1/31/14 weekly) that took nearly 2 months to complete the USQD and ESS.

Chemistry and Metallurgy Research Building (CMR)–Criticality Safety: On Wednesday, LANL provided the Field Office with the results of a criticality safety review conducted by a LANL review team at the CMR. The review was performed to evaluate whether criticality issues similar to those identified in the Plutonium Facility also existed at CMR, as well as to improve the overall criticality safety performance at CMR. The review identified a number of opportunities to improve operator performance, operator training, and criticality safety postings. This review is one of many criticality safety improvement initiatives underway at LANL, the results of which have been compiled into one coordinated Criticality Safety Project Management Plan.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 23, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 23, 2015

Transuranic Waste Management: Last week, the field office requested a plan from LANL for sustaining operations during the shutdown of the Waste Isolation Pilot Plant (WIPP). The response provided an outline of waste generation and storage status and commits to providing a quarterly status report. The quarterly reports will assume LANL shipments to WIPP commence by October 1, 2016. The response also notes that the current inventory at Area G is at 28k of the 57k Pu-239 equivalent curie limit in the safety basis and that Area G personnel expect to implement use of pipe overpack containers in the safety basis later this spring. The use of pipe overpacks allows for a 90 % reduction in material-at-risk (MAR).

Plutonium Strategy: On Wednesday and Thursday, NNSA and LANL personnel conducted a working meeting in support of development of a final recommendation on whether to upgrade the Radiological Laboratory Utilities Office Building to a Hazard Category 3 nuclear facility to be operated at a limit of 400 g Pu-239 equivalent (see 10/24/14 weekly). The team expects to present their recommendation to senior NNSA leadership next month.

Plutonium Facility–Emergency Management: Last week, personnel conducted a facility-level drill for the readiness assessment team. The drill scenario involved a continuous air monitor alarm and an injured contaminated patient. In contrast with institutional-level exercises, responders donned respirators, performed field decontamination techniques, and physically loaded and moved the contaminated patient without simulation. In the last few months, facility personnel have initiated these style drills in preparation for upcoming readiness assessments (RA). Eventually, this effort will need to translate into a documented drill program to cover the full spectrum of potential abnormal events, locations, times of day, and personnel.

Plutonium Facility–Restart Activities: On Friday, the contractor RA team for the T-Base II machining activity out-briefed their results to management. The team identified two pre-start findings associated with the quality of evidence packages for the assessment prerequisites and the inability of planning and resource allocation processes to preserve the integrity of the facility safety envelope. The team identified three post-start findings associated with non-compliant material labeling practices for criticality safety, non-compliant criticality safety evaluations, and incomplete criticality self-assessments. In addition, there were 25 opportunities for improvement. Of note, the team commended the work crew associated with the machining activity as a model for others to follow. The federal RA for T-Base II is currently scheduled for May. The next contractor RA will cover the balance of machining operations and is scheduled to begin in mid-February.

Plutonium Facility–Quality Assurance: During the past several months, Plutonium Facility management declared multiple Technical Safety Requirement (TSR) violations associated with the failure to properly execute surveillances of MAR limits using the MAR Tracker software tool (see 11/7/14 weekly). In response to these failures, Plutonium Facility personnel performed an extent of condition review that identified additional issues with the MAR Tracker software (see 1/9/15 weekly). LANL recently reported to the field office that the exhaustive extent of condition review was completed and all surveillances have been performed to ensure the facility safety envelope is intact. Based on these actions, Plutonium Facility management reports that there is a high level of confidence that the related MAR Tracker issues have been resolved. Assurance personnel are continuing the latest of several causal analyses for these issues to ensure corrective actions are implemented that prevent future MAR Tracker configuration issues.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 30, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending January 30, 2015

RANT Shipping Facility: On Tuesday, LANL management transmitted to the field office for approval the positive Unreviewed Safety Question and the Evaluation of the Safety of the Situation (ESS) for an incorrect assumption in the seismic analysis for the facility structure (see weekly 12/9/2014 report). The ESS indicates that the RANT structure does not meet DOE-STD-1020-2002 criteria for an existing Performance Category 1 facility, contrary to its credited function to withstand a Performance Category 2 seismic event. The ESS notes that the operational restriction to maintain RANT in Cold Standby will continue (the Field Office has also withdrawn approval of the safety basis) and discusses several options to be studied in the next 90 days. The options include seismic bracing for the facility, seismic cutoff switches for electrical power, seismic cages to protect material-at-risk, or only performing loading operations outdoors via the mobile loading unit.

Plutonium Facility–Configuration Management: On Wednesday, operations personnel discovered about 3.5 L of unexpected solution in two pencil tanks. The tanks, and nearly all of the operations in the room, have been out of service since May 2013. This room has had frequent contamination issues and has been under restricted access, which resulted in the recent missed surveillance (see 1/16/15 weekly). This discovery occurred during the extent of condition review directed following the unexpected discovery of about 30 L back in November (see 11/21/14 weekly). While personnel expect both sets of liquids to be lean in nuclear material, they have yet to determine the composition of the liquid or a suspected source.

Weapons Engineering Tritium Facility (WETF)–Formality of Operations: In response to questions from the Facility Representative, WETF management convened a fact-finding to investigate an improperly performed maintenance activity that resulted in a facility evacuation alarm. The fact-finding revealed that in December, an operator was performing a surveillance on the tritium monitoring system when he operated an incorrect switch on the back of a tritium monitor. The fact-finding identified that switches on the back of the monitor are unlabeled and that the operator did not have visual access to the switches because he did not use a ladder. After determining the incorrect switch was functioned, the operator incorrectly repositioned the switch without stopping and informing management as required. This action also activated the facility evacuation alarm and all personnel evacuated to the control room. The operator informed control room personnel that the incorrect repositioning of the tritium monitor high voltage switch caused of the alarm. In response, control room personnel failed to complete the appropriate alarm response procedure.

Also this week, management convened two fact-findings after it was discovered that unauthorized modifications had been performed on a safety significant fire door credited as a one-hour fire barrier. In this instance, vagueness in the work instruction led maintenance personnel to believe they could add washers they had on hand to shim a strike plate on the door so it would engage a latch. Significant issues identified included: (1) the door latch had been inoperable for some time and in certain circumstances the door was being held in place with a wooden wedge, (2) the strike plate on the door was a modification made numerous years ago that was undocumented and did not appear to use appropriate materials, and (3) instructions provided by safety basis personnel in the integrated work document were not followed. LANL management has acknowledged they will need to address issues with formality of operations within WETF prior to resuming readiness activities. They plan to employ additional mentors, similar to the ones used to prepare the Plutonium Facility for its recent successful contractor readiness assessment, to assist facility operators.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 6, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 6, 2015

Area G–Conduct of Operations: On Wednesday, Area G management issued a standing order to clarify terminology and the expected response to certain abnormal conditions associated with the nitrate salts. Management previously developed a special *Response Plan* for these waste materials; however, an event late last month revealed weaknesses in the plan and an overall lack of awareness amongst key responders. Specifically, Area G experienced an electrical power transient on a Saturday afternoon, which apparently caused the control management unit for the Continuous Air Monitors (CAM) in the Dome 375 Permacon to go into audible alarm. The control management unit remained in audible alarm for more than 17 hours until Sunday morning when a radiological control technician (RCT) entered the Dome, noticed the alarm, and responded per normal procedures for a CAM alarm. However, given the circumstances with the nitrate salts, the *Response Plan* dictates a different response approach involving additional assets for a CAM alarm and other abnormal conditions. The standing order reminds operators of the *Response Plan* until management can convert its elements into an Abnormal Operating Procedure to define clear entry conditions, response actions, and associated responsibilities.

Waste Characterization Reduction and Repackaging Facility (WCRRF)–Emergency Management: On Wednesday, WCRRF personnel conducted their annual emergency exercise. This year’s scenario involved a postulated explosion and fire associated with processing of nitrate salt waste. The exercise employed a wide spectrum of artificiality. On the realistic side, safety class vehicle barriers were lowered to allow fire department apparatus and personnel directly into the facility complex, hoses were pulled, and responding RCTs arrived in full protective equipment and respirator. On the artificial side, glovebox workers wore modesty clothing instead of coveralls and fire department personnel were pre-approved to simulate supplied air use and contaminated patient handling. At the hotwash, a manager indicated there was a need for the entire Technical Area 55/50 complex, which includes three nuclear facilities, to better integrate responses and participate in joint exercises. WCRRF has been in cold standby since last summer, but facility personnel have recently been working to develop a drill program that they expect to deploy at Area G in coming months.

Confinement Vessel Disposition (CVD) Project: Assay results for the first processed confinement vessel have been obtained (see 12/19/14 weekly). The results indicate that the remaining nuclear material in the sphere exceeds the decontamination goals identified in the procedure by nearly three times. Project personnel are considering alternate paths forward including modifying the procedure decontamination goals to allow the sphere to be shipped without further decontamination to Area G for final disposition. In parallel, project personnel are moving forward with activities necessary to move the second sphere from Technical Area 55 to the Chemistry and Metallurgy Research Building for its cleanout.

Transuranic Waste Management: LANL submitted to the field office for review and approval a revision to the Area G technical safety requirements. This revision will allow up to 90 percent more material-at-risk risk under existing inventory limits for waste stored in pipe overpack containers (see 1/23/15 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 13, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 13, 2015

DNFSB Activity: New Board Member Santos, accompanied by Board Member Sullivan and staff member D. J. Campbell, visited the lab for familiarization. The visit included walk-downs all of the primary defense nuclear facilities and introductions with key federal and laboratory management.

Plutonium Facility–Criticality Safety: Plutonium Facility management unveiled revision 13 to the local administrative procedure for nuclear criticality safety. Notably, this revision requires workers to post a hardcopy of the inventory at each fissionable material operation and to update this hardcopy as soon as practicable following any change to a parameter important to criticality safety. This change addresses a post-start finding from the recent contractor readiness assessment, several findings from internal and NNSA assessments, and the Board letter dated July 15, 2013. While this change moves LANL into compliance with the DOE Directives, the inventory tracking process remains fallible to human error. To address this vulnerability in the longer term, Plutonium Facility management initiated an effort to explore technological solutions (e.g., barcodes or radiofrequency identification tags) to enable workers to obtain direct measurement of the inventory at the time of material movement. These mainstream technologies are currently cost effective; however, challenges remain with security requirements.

Weapons Engineering Tritium Facility (WETF)–Safety Systems and Conduct of Operations: Last week, a series of safety system and conduct of operations failures created a situation where operations personnel could not comply with a limiting condition for operation (LCO), forcing them to enter the generic LCO. During a surveillance in June 2014, a ventilation damper was identified to be broken such that it could not perform its safety function to isolate the control room upon activation of the halon fire suppression system. In response, facility personnel installed a blank over the damper to seal the ventilation duct. This modification caused the differential pressure between the control room and an adjacent hallway to change such that a safety significant fire door would not operate as required (see 1/30/15 weekly). Failure of the door to function properly rendered the fixed wet-pipe fire sprinkler system inoperable necessitating a fire watch to comply with a LCO. While in this LCO, a low-level tritium alarm occurred in the facility, preventing operators from performing the fire watch and resulting in the TSR violation. Investigation into the cause of the tritium leak revealed that during performance of a routine surveillance two steps of the use every time procedure were skipped that resulted in a valve being left open and a fitting left uncapped.

Safety Basis: On Wednesday, management paused all Unreviewed Safety Question (USQ) activities at the lab after a management assessment identified multiple instances where analysts incorrectly applied the USQ process to maintenance activities performed on credited Design Features. In several occasions, these instances resulted in TSR violations. USQ operations resumed following special training to analysts that emphasized the need ensure that safety bases appropriately cover maintenance activities on Design Features. In the opinion of the Site Representatives, providing LCO coverage for Design Features—a best management practice utilized by Lawrence Livermore National Laboratory—would prevent this situation and similar situations that may temporarily impact credited systems (i.e., emergency exercises).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 20, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending February 20, 2015

Plutonium Facility–Restart Activities: The federal readiness assessment (RA) team for the T-Base II machining operation was onsite this week to receive an in-briefing, tour the facility, and establish administrative logistics. The team plans to commence field activities on March 23, 2015. Separately, activities supporting the contractor RA for the balance of plutonium machining operations continue with the field office approving a revised plan of action for the contractor RA and LANL submitting a request to exit the justification for continued operations for the associated fissile material operations. The contractor RA team plans to commence their review the week of March 9.

Plutonium Facility–Criticality Safety: Last week, facility personnel completed facility-wide installation of the rain caps—engineered features that preclude water ingress from external sources (e.g., fire sprinklers and pipe leaks) into gloveboxes through inlet filters. In addition to the caps, the work also included replacement of wooden filters with modern metal units.

Transuranic Waste Operations–Restart Activities: Last Friday, LANL submitted a proposed plan for the restart of legacy transuranic waste operations to the field office. The plan discusses the need for safety basis modifications at Area G, the Waste Characterization Reduction and Repackaging facility, and the RANT shipping facility. The safety basis modifications are needed to resolve pre-existing issues, as well as enable implementation of a cooling control strategy for the final treatment of the remediated nitrate salt wastes. The plan indicates the need for actions in several Focused Improvement Areas including roles and responsibilities, procedure control, process control, conduct of operations, quality assurance, training, and sub-contractor management. It also acknowledges that adjustments may be needed after receipt of the final report from the DOE Accident Investigation Board. LANL currently anticipates the need to conduct federal RAs for a sampling campaign and then again for final treatment operations. With respect to the nitrate salts, the proposed schedule shows sampling operations commencing in the 4th quarter of fiscal year 2016 and treatment operations completing in early fiscal year 2019. NNSA and DOE-EM are reviewing LANL's proposed plan.

Area G–Nitrate Salts: On Wednesday, the chemistry team issued their report entitled *Chemical Reactivity and Recommended Remediation Strategy for Los Alamos Remediated Nitrate Salts*. The report represents a key technical input to the restart plan discussed above and provides an understanding of the chemical and biological processes that may have led to the breach of drum 68660. However, the report notes that additional experimental work under nuclear quality assurance practices is needed to support safety basis modifications.

Last week, LANL transmitted information to the state regulator in support of a proposal to remove the 29 unremediated nitrate salt waste drums from the Dome 231 Permacon. In the opinion of the Site Representatives, moving these drums could make the Permacon a viable and more robust alternative to the current plan to conduct sampling operations in the plastic tent within Building 412.

Transuranic Waste Storage Facility Project: On Thursday, project personnel completed the first nuclear quality concrete placement for one of the storage buildings.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 27, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 27, 2015

DNFSB Staff Activity: T.L. Hunt was on site this week to observe the conduct of a self-assessment of the local NNSA facility representative program and to discuss staffing plans with Field Office management. R.K. Verhaagen observed a meeting of the seismic expert panel focused on LANL's Plutonium Facility in San Francisco during February 22–23, 2015.

Weapons Engineering Tritium Facility (WETF)–Restart Activities: WETF personnel continue to work through corrective actions to address findings from the September 2014 contractor readiness assessment (CRA) and to prepare for facility restart and follow-on readiness activities (see 9/19/14 weekly). Notably, the acting Principal Associate Director for Operations (PADOPS) is holding weekly meetings with involved senior lab management, facility management, and program management to discuss the status of corrective actions necessary to prepare for the re-performance of a full scope CRA scheduled to start the week of March 16, 2015. These meetings aim to ensure the schedule is upheld and to ensure resources are being employed to address emerging issues. The PADOPS will also chair a Management Review Board designed to have all Safety Management Program owners attest to the readiness of their individual programs prior to commencing the CRA.

On Monday, WETF implemented a completely revised Facility Radiation Protection Requirements (FRPR) document to address several CRA findings. The implementation followed training that included a required reading, a mandatory short demonstration, and a second required reading following revisions stimulated by discussion during the demonstration. Notably, the new FRPR includes more stringent personal protective equipment requirements for all activities in the facility. Accordingly, implementation of the FRPR has resulted in the need to modify numerous facility operating procedures that personnel will have to exercise to ensure proficiency prior to restart.

WETF management recently released the report from a causal analysis performed to address the numerous issues encountered during the September 2014 contractor readiness assessment. The causal analysis team evaluated results of the contractor readiness assessment as well as two reports issued by the NNSA facility representative relating to readiness and conduct of operations. The causal analysis team concluded in their report that improvements were needed in management expectations and performance standards, event investigations to prevent recurrence, management monitoring, and operator proficiency and performance. The causal analysis noted that the current CRA corrective action plan addresses both individual issues identified during the CRA as well as the overarching issues identified in the report.

Management: The PADOPS recently reinvigorated the format of the weekly Executive Management Risk Review meetings to include more in-depth discussions on the LANL Director's top priorities. For example, this week's meeting included about a half hour of detailed discussion, largely led by the Director, on the progress and impediments to WETF restart. Future recurring topics of interest to the Board include Plutonium Facility restart activities, nuclear criticality safety stability, Plutonium Strategy execution, nitrate salt recovery, RANT shipping facility capability, and wild land fire management.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 6, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 6, 2015

Field Office: On Monday, the field office Manager announced that Mr. John Krepps is the new Senior Technical Safety Advisor. This assignment fills a vacancy that has existed for multiple years. Additionally, she announced temporary fills from other field offices for the Acting Deputy Manager and Assistant Manager for Operations while permanent assignments for these key safety-related positions are processed.

Plutonium Facility–Safety Systems: Last Friday, LANL submitted to the field office for review and approval a Safety Design Strategy (SDS) for the Plutonium Facility Active Confinement Ventilation Upgrade Project (ACVUP). This upgrade to the Plutonium Facility ventilation system is a commitment from DOE in the implementation plan for Board Recommendation 2009-2 to reduce the risk of a seismically induced fire. The SDS notes that the ACVUP is in the conceptual design phase and that final configuration for the construction and operation of the active confinement ventilation system is in development. The SDS reiterates that the ACVUP constitutes a major modification to the existing Plutonium Facility safety basis and provides the graded approach intended for development of safety basis documents (see 1/9/2015 weekly). Notably, the SDS indicates that LANL will design the system under the requirements of DOE Order 420.1B, *Facility Safety*.

Weapons Engineering Tritium Facility (WETF)–Emergency Management: On Wednesday, WETF personnel conducted an emergency exercise in preparation for upcoming readiness activities. The exercise scenario postulated that a worker executing a delivery on the loading dock experienced a medical condition and dropped a legacy tritium container breaching its contents. Overall, WETF personnel acknowledged that although some improvements were realized, the fire department's approximately 30 minute response time to the patient should be quickened. In particular, in this scenario a radiological control technician immediately reported airborne tritium measurements from the scene of $90 \mu\text{Ci}/\text{m}^3$ —levels that do not prohibit immediate approach. In the opinion of the Site Representatives, while the overall response was somewhat improved compared to recent WETF exercises, difficulties persist with fundamental elements including command and control, and communications indicating that completed corrective actions may not have fully addressed the underlying problems. In addition, simulation continues to create challenges. For example, one of the workers on the dock simulated a call to 911 and then actually called the operations center. In reality, the worker would likely need to stay on the line with 911, which would have entirely changed the flow of information to the facility operations center and the Facility Incident Command.

Area G–Nitrate Salts: On Tuesday, LANL submitted to the field office for approval a revised Evaluation of the Safety of the Situation (ESS) for the storage of nitrate salts. The revision addresses the need to include two additional remediated nitrate salt containers that Area G personnel recently identified as part of an extent-of-condition review. Following approval of the ESS, Area G personnel plan to relocate these pipe overpack containers to the Dome 375 Permacon. In addition to accounting for these new containers, the ESS clarifies the specific controls relied upon to justify continued operations. This clarification helps to address questions that arose after two recent snowstorms prevented completion of hourly rounds for visual inspections and temperature readings.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 13, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending March 13, 2015

Plutonium Facility–Restart: On Thursday, the contractor readiness assessment team commenced their review of the Balance of Machining activity. Balance of Machining includes the DMU35 milling machine, the Precitech machine, drill and press operations, and the robotic lathe. These operations span three different rooms and involve eight fissile material handlers and two first line supervisors. This represents considerably larger scope than the T Base 2 activity, though there is some overlap with personnel. The team observed performance demonstrations and a drill on Friday and plans a full slate of interviews through the weekend prior to additional activities next week.

Plutonium Facility–Seismic Safety: Last week, facility personnel completed the initial carbon fiber wrapping on the first roof girder. They initiated wrapping the second girder this week.

Plutonium Facility–Safety Basis: This week, LANL submitted several safety basis documents to the field office for approval:

- A request to extend the implementation declaration date for the 2014 safety basis from February 27 to August 7, 2015. They note the critical path to implementation is rework associated with the MAR Tracker inventory database following recent extent of condition issues. LANL also notes they will have an interim implementation declaration for use of additional types of fire-rated containers by April 27, 2015.
- A request to extend the Justification for Continued Operation (JCO) associated with the Facility Control System by one year to March 31, 2016. Closure of this JCO requires approval of page changes to the safety basis. LANL notes that there are currently two other sets of page changes that have been submitted and suggest awaiting their approval and implementation prior to submitting the additional page change so it can be made to an updated and approved safety basis document.
- A request for a temporary modification to allow reuse of catch tube apparatus parts for surrogate shots on the Isotope Fuels Impact Tester. The safety basis currently specifies these parts as safety significant and prohibits reuse. LANL has an insufficient supply of replacements to support the demonstrations needed for upcoming readiness activities.

Area G–Safety Basis: On Monday, LANL submitted to the field office for approval the JCO concerning the receipt of newly generated transuranic waste containing higher combustible fractions than the 3 % fraction assumed in current analysis. Facility management declared a Potential Inadequacy of the Safety Analysis for this issue on December 5, 2014. The JCO includes a new Specific Administrative Control to either (1) close the road in the vicinity of the transportation vehicle during waste receipts or (2) limit the radiological content of shipments to less than 85 Pu-239 equivalent curies (PE-Ci) Equivalent Combustible Waste for direct loaded containers or less than 350 PE-Ci Equivalent Combustible Waste for doublepacked containers.

On a related issue, the field office approved on Wednesday the fourth revision of the JCO associated with single drum pool fires. The approval codifies a new Specific Administrative Control to doublepack drums containing greater than 80 PE-Ci. The Board's staff first raised the questions that resulted in both of these JCOs during a review in late January 2014.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 20, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 20, 2015

DNFSB Staff Activity: The Site Representatives participated in briefings at DNFSB Headquarters this week. Staff member P.J. Foster was onsite to observe the NNSA Construction Peer Review (CPR) of the Transuranic Waste Facility (TWF).

Transuranic Waste Facility: This week, NNSA performed an annual CPR to ensure the TWF project is on path to complete construction and meet the approved technical scope within the project's cost and schedule. The CPR team identified a number of specific recommendations that require resolution and provided the following summary conclusions: (1) the project has sufficient management reserve and contingency to finish on time and budget; (2) safety basis development is on the project's critical path and a coordinated submittal and review effort is necessary between the Field Office and the project; and (3) the project needs to incorporate commissioning activities in the integrated project schedule. The Critical Decision 4 for TWF is scheduled for January 2018.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 27, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 27, 2015

DNFSB Staff Activity: Staff member D.J. Campbell was on site this week to observe a federal readiness assessment (FRA) in the Plutonium Facility and to augment site rep activities.

Federal Oversight: On Monday, the DOE Office of Environmental Management stood up a local Field Office to oversee work scope performed at LANL. For an interim period, the NNSA Field Office will continue to perform primary nuclear safety approval and oversight functions with some documents requiring concurrence from Environmental Management Headquarters.

Area G–Nitrate Salts: On March 13, the NNSA Field Office approved the revised Evaluation of the Safety of the Situation (ESS) for the continued storage of the remediated nitrate salt wastes (see 3/6/15 weekly). The Field Office approval determined that LANL's proposed Specific Administrative Controls for temperature monitoring and headspace gas monitoring were no longer necessary.

Last week, the LANL Explosives Review Committee issued a memo indicating that certain surrogate mixtures for the remediated nitrate salt wastes were sensitive to electrostatic discharge at levels of 25 mJ when tested in bounding physical forms (i.e., finely ground powders). The memo notes that the Faraday shielding provided by the drums will mitigate this concerns for storage applications, but recommends the use of non-sparking tools and electrical bonding for intrusive work with these materials. Area G management has reviewed this information and is incorporating the recommendations into planning for the final treatment process.

Plutonium Facility–Restart Activities: The FRA for the T-Base II machining operation commenced this week. This is the first FRA to occur as a part of the restart activities to resume operations following the LANL Director's pause in June 2013. Notable activities included the observation of a machining performance demonstration, the conduct of an evaluated operations drill, personnel interviews, facility and system walk-downs, and document reviews. The FRA will continue through next week with an out-brief scheduled to occur on Friday.

Weapons Engineering Tritium Facility (WETF)–Safety Systems and Conduct of Maintenance: WETF personnel continue to struggle to complete the maintenance and testing necessary to restore operability of a safety significant fire door, the halon fire suppression system, and the fixed wet-pipe fire sprinkler system (see 2/13/15 weekly). Most recently, a series of work packages were used to adjust and test the fire door as well as to troubleshoot and repair an intermittent halon system fire panel alarm. Following completion of the work packages and their specified testing, facility personnel restored the operability of the systems and exited the fire watch necessitated by the limiting conditions for operations. During a review of the completed work package for the fire door, the NNSA Facility Representative noted issues with the performance and documentation of the post maintenance testing. Additionally, a subsequent NNSA Facility Representative review of the work package for the halon system identified that it was incomplete. The systems were again declared inoperable and the fire watch re-entered.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 3, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending April 3, 2015

Area G–Nitrate Salts: On Monday, Area G personnel successfully relocated into the Dome 375 Permacon the four newly identified drums thought to contain remediated nitrate salt wastes (see 3/27/15 weekly). Last Friday, LANL submitted to the NNSA Field Office a study on temperature control options for the Permacon. The study notes that there is no compelling technical justification for additional cooling; however, the LANL Director determined that additional cooling will be implemented as a defense-in-depth measure. The selected option involves installation of a supplemental chiller into the existing ventilation system to cool the Permacon to about 5 °C. LANL expects the system to be operational by the end of May 2015.

Plutonium Facility–Restart Activities: On Thursday, the federal readiness assessment team out-briefed the results of their review on the T-Base II machining operation. The team identified four pre-start findings: (1) the nuclear criticality safety evaluation inappropriately relied on an upper subcritical limit that was not supported by the validation report and the independent review was inadequate; (2) the procedure does not implement criticality safety controls consistent with DOE requirements; (3) an inconsistency between the safety basis and the fire hazards analysis concerning glovebox firefighting media was not entered into the New Information process; and (4) the Field Office lacks a documented basis for a safety basis condition of approval concerning the glovebox support stand. The team identified 10 post-start findings. Notable items involve the lack of an established drill program, inadequate procedural implementation of labeling, problems with the Unreviewed Safety Question process, and inadequate Field Office oversight. The team also noted that their detailed report contains additional concerns and non-compliances that did not rise to the agreed upon threshold for a finding, but that management ought to consider for improvement.

Plutonium Facility–Nuclear Criticality Safety: Last Friday, the Field Office directed LANL to: (1) review for sufficiency all legacy criticality safety evaluations applicable to restart activities, (2) evaluate the ability of the criticality staff to support operations given the ratio of operations under compliant evaluations versus those operating under compensatory measures, and (3) update their program improvement plan to reflect resolution of legacy issues and actions to develop evaluations for operations with current compensatory measures. These actions are due in 60 days. In addition, the Field Office directed LANL to develop compliant evaluations for all operations under legacy Augmented Limit Reviews prior to restart.

Plutonium Facility–Configuration Management: On Monday, facility personnel conducted a fact-finding after operators discovered 10–15 L of unexpected liquid in a vacuum trap in one of the aqueous processing rooms. The operators were conducting additional monitoring of vessels directed after previous unexpected liquid discoveries (see 1/30/15). This is the fourth discovery of unexpected liquid in the last year. While operators previously sampled the liquid in those cases, management has yet to receive results or otherwise determine the source(s) of liquid associated with the past two discoveries dating back to November. During the fact-finding, personnel indicated that the previous extent of condition review excluded process support vessels such as vacuum traps. However, field office personnel questioned the need to examine all vessels that are in communication with certain vessels that are geometrically unsafe from a criticality perspective. Subsequently, facility personnel took an action to verify the administrative lockout on the geometrically unsafe vessels in the near-term and seek a longer-term solution to isolate physically these vessels from the system. Facility personnel also indicated that they were developing as-built drawings on a schedule to support future readiness assessments, but they would not develop drawings for systems slated for eventual removal.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 10, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 10, 2015

Fire Protection: Last week, the NNSA Field Office approved the fiscal year 2015 Baseline Needs Assessment (BNA). The BNA identified the following issues: (1) current pre-incident plans do not contain much of the information mandated by DOE Order 420.1B, *Facility Safety*, and NFPA 1620 needed to support timely and effective response; (2) the Los Alamos County Fire Department procedure for minimum staffing requires update; and (3) the roles, responsibilities, accountabilities, and authorities (R2A2) between the NNSA Field Office, LANL, and the fire department are not well defined. The BNA notes that two of these issues are long-standing. Notably, the deficiency in pre-incident plans was previously identified in the 2009 BNA, as well as subsequent self-assessments and a DOE/NNSA assessment. In addition, a 2013 DOE/NNSA assessment previously identified the issue with R2A2s.

Plutonium Facility–Safety Systems: Recently, the facility experienced a number of events concerning degraded safety systems resulting in unanticipated entries into action statements specified in the Limiting Conditions for Operation (LCO). The recent events include: (1) last Tuesday, personnel performing a weekly surveillance identified that the heater unit on one of the safety class firewater pumps had failed; (2) on Saturday, a compressor on the safety significant Instrument Air System failed; and (3) the safety significant Facility Control System failed briefly on Tuesday evening then fully crashed on Wednesday evening. Fact-findings revealed questions on proper unit sizing and quality concerns for parts for the first two, respectively. On Tuesday, the facility also experienced an unanticipated LCO entry due to a momentary transient out of the required pressure differentials associated with the safety significant ventilation system. Facility personnel have been troubleshooting this issue following an unusually high number of events (e.g., they logged about 50 such entries from September 2014 through February 2015). Facility management believes the high number may be attributed to increased operator formality leading them to log even brief transients, some potential equipment problems, and the impact of high winds on the external pressure sensor.

Weapons Engineering Tritium Facility (WETF)–Comprehensive Causal Analysis: The Associate Director for Nuclear and High Hazard Operations (ADNHHO) appointed a team to conduct a comprehensive causal analysis and extent of condition review for a missed in-service inspection (ISI) on a tritium containment vessel. During a critique of the event facility personnel identified that procedural deficiencies and an inadequate tracking system were the main contributors to the missed ISI that resulted in a Technical Safety Requirement (TSR) violation. The team's appointment letter from ADNHHO directs them to determine the causes that contributed or lead to this incident, as well as to review a number of other recent similar events that have been reported in the Occurrence Reporting and Processing System to identify common contributors. The team is also chartered to expand the review to evaluate all currently implemented TSR controls using the causal analysis results and to validate all implemented TSR controls are appropriately identified and incorporated into processes or programs that adequately manage and maintain these controls. The team is actively performing this review and intends to have their report with recommended corrective actions completed in the next few weeks.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 17, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 17, 2015

Plutonium Strategy–Radiological Laboratory Utility Office Building (RLUOB): On Wednesday, LANL submitted to the field office for review and approval a safety design strategy for upgrading RLUOB to a Hazard Category 3 nuclear facility. The strategy proposes increasing the radioactive material inventory to up to 400 grams of Pu-239 equivalent. This increase will allow relocating additional analytical chemistry and material characterization processes from the Chemistry and Metallurgy Research (CMR) facility that had previously been slated for the now deferred CMR Replacement nuclear facility. The increase in radioactive material inventory limits, as well as completion of the RLUOB Equipment Installation Phase 2 and Plutonium Facility Equipment Installation (see 8/15/14 weekly), will accommodate the transition of all analytical chemistry and materials characterization processes currently performed in CMR to RLUOB and the Plutonium Facility.

Area G–Nitrate Salts: This week, LANL chemists and energetic materials experts initiated a series of experiments at the request of the DOE Accident Investigation Board in an attempt to recreate the event associated with Drum 68660 in the Waste Isolation Pilot Plant. These experiments are being conducted at full scale within four 55-gallon drums with their contents prepared to resemble as closely as possible the known conditions within Drum 68660 without using radioactive materials. The experiments will be conducted in two temperature controlled transportainers with two 55-gallon drums in each. These LANL experts will now focus on planning and executing a limited set of experiments to support the safety basis for future sampling and treatment activities for the remediated nitrate salt wastes. These experiments will be performed under quality assurance appropriate for nuclear facility applications, whereas the full-scale tests are considered research and development and will not be used to inform safety bases.

Plutonium Facility–Restart Activities: Numerous Plutonium Facility restart activities were completed over the preceding week, including:

- The final report for the T-Base 2 machining federal readiness assessment (FRA) was issued. The assessment team found that fifteen out of sixteen functional area objectives were met, with the criticality safety objective being unmet. The FRA team concluded that upon correction of the pre-start findings (see 4/3/15 weekly) T-Base 2 machining would be ready to restart operations.
- The final report for the Balance of Machining contractor readiness assessment (CRA) was issued (see 3/13/15 weekly). Three pre-start findings were identified relating to an inadequate startup plan, improper use of a machining plan as a work control document, and software quality assurance issues. Seven post-start findings identified issues with conduct of maintenance, transient combustible loading, beryllium hazards, and training and qualification. The CRA team concluded that following satisfactory resolution of pre-start findings Balance of Machining would be ready to restart operations. The FRA is currently scheduled to start in early June.
- A management self assessment for the Isotopic Fuels Impact Tester was completed. The follow-on CRA and FRA are currently scheduled to be completed this fiscal year.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 24, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 24, 2015

DNFSB Staff Activity: R.K. Verhaagen attended offsite training on quality assurance and software quality assurance.

Plutonium Facility–Nuclear Material Management: On Thursday, facility personnel conducted a fact-finding after an Implementation Verification Review team identified that several Conflat-type containers of nuclear material were improperly listed in the nuclear materials management database as a certified type. The safety basis credits certified containers to reduce the damage ratio for the container and its resulting contribution to an accident source term. In reality, there is only one size of a Conflat-type container that is certified even though a variety of sizes are present in the facility. Notable points discussed by participants included:

- There are at least four different procedures governing types of containers with multiple requirement drivers including material-at-risk reduction and criticality safety. Procedure content and associated training were not adequate to ensure worker performance.
- The certified Conflat-type containers are not currently in use, but are available in the warehouse.
- The database contains about 200 types of containers, yet provides little information regarding a container's characteristics or specialized function. In addition, some container varieties are available in certified and non-certified forms.
- Configuration management processes for the database and linkage to the procedures was unclear.
- Most certified containers were dropped tested to survive a fall from 11 feet; however, some storage and handling locations in the facility exceed this height.
- The database expert recently retired and chronic staffing shortages resulted in a lack of readily available and qualified individuals to troubleshoot this problem.
- Engineering staff had spot-checked the correct use and listing of other certified containers.

The Associate Director for Plutonium Science and Manufacturing and his Deputy attended the critique, recognized that the situation was untenable for the workforce, and directed the utilization of external resources to conduct a Six Sigma like process analysis to eliminate by redesign rather than patch many of these problems.

Area G–Safety Basis: The safety basis limits material-at-risk to an overall aboveground inventory of $\leq 57,000$ Pu-239 Equivalent Curies (PE-Ci) and a composite source term of ≤ 1.06 PE-Ci. This composite source term accounts for the composition of the waste and assumes that 93.04 % of the waste is noncombustible-nondispersible material, 3.89 % is noncombustible-dispersible, and 3.06 % is combustible-dispersible. Recently, several issues have emerged associated with the composite source term. Last Friday, workers recognized that the remediated nitrate salt wastes were actually combustible, but were coded as noncombustible-nondispersible. As a result, Area G management declared a Potential Inadequacy of the Safety Basis and restricted receipt of new generated wastes. Prior to this event, Area G personnel were struggling to accept newly generated wastes and maintain compliance with the composite source term, since newly generated wastes typically include a higher fraction of combustible materials.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 1, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 1, 2015

DNFSB Staff Activity: On Wednesday, staff members T.A. Chapman and D.J. Campbell held a teleconference with field office and LANL personnel to discuss the status of an emerging nuclear facility drill program.

Area G–Nitrate Salts: Last Thursday, LANL scientists obtained the first result associated with the full-scale drum experiment (see 4/17/15 weekly). Specifically, the contents of the sealed 55-gallon drum in a 60° C environment initiated a thermal runaway reaction, pressurized the drum, and forcefully ejected the drum's lid. This experimental result was anticipated, given the elevated temperature and non-vented conditions. LANL scientists are analyzing the data from the experiment and continue to monitor the other three drums.

Plutonium Facility–Fire Protection: For the T Base II activity, one of the federal readiness assessment team's pre-start findings concerned the fire extinguishing agent available within the glovebox. Specifically, the team noted that the use of graphite was inconsistent with the fire hazard evaluation which indicated the need for magnesium oxide. In addition, the team noted that the volume of agent was half of that required and its placement was not within reach from the location where plutonium metal turnings were handled and stored. In response to this finding, facility personnel have revised the fire hazard evaluation to indicate that graphite is acceptable even though magnesium oxide is preferred, consistent with DOE Handbook 1081-2014, *Primer on Spontaneous Heating and Pyrophoricity*. Facility personnel have also developed a plan to eventually transition to the use of magnesium oxide across the plant and to strengthen the processes used to ensure appropriate staging, inspection, and use of the agent. The Site Representatives note that this effort provides an ideal opportunity to correct the inconsistencies between the actual conditions in the plant and the mock-up used for training with the fire department (see 11/21/14 weekly).

Transuranic Waste Management: Last Friday, LANL submitted to the field office its first quarterly status report on efforts to support sustained laboratory operations during shutdown of the Waste Isolation Pilot Plant (see 1/23/2015 weekly). The report included a list of projects for which transuranic (TRU) waste generation forecasts have been developed, current Area G waste inventories, and a set of initiatives aimed at prioritizing TRU waste generation and storage. LANL identified that 155 containers of TRU waste were received in Area G for storage between June 1, 2014 and March 31, 2015. Of note, these receipts increased the material-at-risk composite source term (CST) from 0.35 Pu-239 Equivalent Curies (PE-Ci) to 0.94 PE-Ci, approaching the limit of 1.06 PE-Ci. Additionally, the report acknowledges that the impact to the actual CST from the Potential Inadequacy of the Safety Analysis relating to remediated nitrate salts that was declared last week (see 4/24/15 weekly) is not yet fully understood. Current projections indicate the limit for CST could be reached as early as September of this year.

Plutonium Infrastructure Strategy: This week the field office approved a revision to the Safety Design Strategy (SDS) for the Plutonium Facility Equipment Installation sub-project (see 8/15/2014 weekly). The revision was made to address Chief of Defense Nuclear Safety and field office comments on the previously approved SDS.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 8, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 8, 2015

DNFSB Staff Activity: J.W. Plaue attended offsite leadership development training on building high performance teams.

Los Alamos Neutron Science Center (LANSCE): On Wednesday, NNSA's Cognizant Secretarial Officer for Safety and the Los Alamos Field Office Manager issued a letter authorizing the establishment of a joint NNSA and Management and Operating partner Accident Investigation Board to investigate a May 3, 2015, accident that occurred at a LANSCE facility electrical sub-station. Of note, the letter indicates that the joint investigation team is modeled after a highly successful investigation conducted at Sandia National Laboratories in 2014. Accident Investigation Board personnel arrived on site and commenced their investigation on Wednesday.

Plutonium Facility–Criticality Safety: On Wednesday, the field office transmitted to LANL a letter outlining concerns with criticality safety infraction management in the Plutonium Facility. The field office notes that there are currently more than 60 unresolved infractions, many of which have been resident for months, or even years. Of greatest concern are the multiple infractions involving unknown liquids discovered in process equipment that have not been properly characterized or addressed (see 4/3/2015 and 1/30/2015 weekly reports), and present an inherently higher criticality risk than non-aqueous operations. In light of these issues, the field office directed LANL to: (1) characterize and ensure the safe stabilization of the unknown liquids, (2) categorize and prioritize identified emergent conditions, and (3) develop a risk-based plan to resolve outstanding infringed conditions. The field office requested a brief on resolution of the unknown liquids in two weeks and a brief on a revised prioritization and recovery plan by May 31, 2015.

Weapons Engineering Tritium Facility (WETF)–Comprehensive Causal Analysis: On Friday, the Associate Director of Nuclear and High Hazard Operation's appointed team issued their report on the comprehensive causal analysis and extent of condition review performed for the missed in-service inspection on a tritium containment vessel (see 4/10/2015 weekly). This comprehensive review identified a number of findings within six functional components, including: (1) effective management oversight, (2) knowledgeable, trained and qualified personnel, (3) formality of operations, (4) nuclear safety culture, (5) System, Structure, and Components performing credited functions, and (6) cross-functional operational planning. Eighteen of the findings are considered pre-start findings to WETF readiness for operations and are being tracked and corrected as part of the WETF resumption plan.

Area G–Safety Basis: LANL safety basis personnel determined that the Potential Inadequacy of the Safety Analysis declared for the remediated nitrate salt waste composite source term (CST) resulted in a positive Unreviewed Safety Question (see 4/24/2015 weekly). Specifically, after recoding the remediated nitrate salt wastes as combustible, the recalculated CST material-at-risk (MAR) value for the existing inventory exceeded the safety basis limits. Facility personnel entered one Limiting Condition for Operation action statement by restricting receipt of all waste and are working on completing the second applicable action statement by revising the safety basis to allow the application of damage ratio for certain containers to lower the calculated CST MAR to below the allowable limits.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 15, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 15, 2015

DNFSB Staff Activity: On Thursday and Friday, E.M. Gibson and R.L. Jackson conducted a review of quality assurance processes used for the construction of the new Transuranic Waste Facility. The review included observation of reinforced concrete placement activities, a walk-down of the concrete batch plant, and record reviews.

Safety Basis: This week, a three-person team from one of the corporate partners conducted a Parent Organization Functional Management Review (POFMR) of safety basis development and management. The team reviewed a number of safety basis division procedures; conducted interviews with analysts, facility and program personnel, the Field Office, and the Site Representatives; and performed a cursory review of recently submitted safety bases for the Weapons Engineering Tritium Facility (WETF) and the Plutonium Facility. The POFMR report is expected in about a month.

Area G—Conduct of Operations: On Wednesday, Area G management released for training an abnormal operating procedure (AOP) governing response to abnormal conditions associated with the remediated nitrate salt wastes stored in the Dome 375 Permacon. Upon completion of training, the AOP will cancel a standing order issued in early February 2015 intended to clarify roles, responsibilities, and actions associated with postulated abnormal events for these wastes (see 2/6/2015 weekly). The Field Office provided numerous comments and suggestions on the nine-page procedure. The Site Representatives note that neither DOE nor LANL provide guidance on the format and content of AOPs.

Area G—Safety Basis: On Thursday, LANL management transmitted to the Field Office for approval an Evaluation of the Safety of the Situation/Justification for Continued Operations (ESS/JCO) concerning the composite source term (CST) issue (see 5/8/15 weekly). The ESS/JCO identified an inadequacy in the implementation of the CST limit, which when corrected resulted in the exceedance of a safety basis limit. The lack of an executable action statement associated with the applicable Limiting Condition for Operations further exacerbated the situation. The ESS/JCO notes that the safety basis uses the CST to establish the bounding unmitigated consequences for the wildland fire and seismic events. As such, Specific Administrative Controls other than the CST limit are relied upon to mitigate consequences to acceptable levels. The ESS/JCO proposes continuing operations through exclusively receiving pipe overpack containers and assuming the contents of these containers, including those in the existing inventory, are unaffected by the wildland fire and seismic event, as supported by DOE-STD-5506. In addition, LANL proposes an extent-of-condition review to ensure proper characterization of the inventory, an effort to overpack high combustible drums, and future changes to the safety basis to derive properly a control set. While waiting on ESS/JCO approval, LANL continues to restrict receipt of transuranic (TRU) waste, but otherwise continues normal operations at Area G. The Site Representatives note that the about two thirds of the unmitigated consequences associated with the wildland fire event are associated with aboveground storage of tritium. The approved safety basis prohibits shaft disposal of this tritium, eliminating an effective risk reduction tool at Area G and hindering risk reductions efforts at WETF.

Transuranic Waste Management: On Tuesday, LANL and Field Office personnel held a meeting to discuss options to allow continued disposition of TRU waste given speculation of a prolonged resolution process for the CST issue. A functioning TRU waste disposition capability is required to continue numerous risk-reduction activities such as the Confinement Vessel Disposition project, the Accelerated Vault Cleanout, and day-to-day elimination of wastes and other combustibles from gloveboxes in the Plutonium Facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 22, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending May 22, 2015

DNFSB Staff Activity: On Monday, M.R. Bradisse, D.J. Campbell, P.J. Foster, and M.T. Wright conducted a teleconference with Field Office personnel to discuss questions with the safety basis for the new Transuranic Waste Facility.

Plutonium Facility–Criticality Safety: On Tuesday, results from a non-destructive assay (NDA) of a recently generated waste drum indicated operators had exceeded a limit in the criticality safety evaluation (CSE). During the fact-finding, facility and Field Office personnel identified several issues related to conduct of operations and implementation of criticality controls. These issues included: (1) NDA operators used an incorrect criticality safety limit approval (CSLA) for a fissile material operation they were performing; (2) multiple CSLAs exist for different waste drum operations creating operator confusion; (3) the quantity of material in a drum being moved could not be verified to be within the limits specified on the CSLA; (4) the drum being moved was not labeled with the specific contents and form of material as required; (5) assumptions used to develop an associated staging CSE may not have been conservative; and (6) assumptions in the staging CSE were not properly captured as part of the control set in the CSLA. As a result of these identified issues, facility management paused all drum movements. The Site Representatives note that these issues are very similar to the issues that contributed to the LANL Director's decision to pause operations in June 2013. Following the pause, waste handling and NDA activities were resumed through LANL processes that did not require formal readiness assessments.

Plutonium Facility–Emergency Management: On Thursday, facility personnel conducted their annual emergency exercise as required by DOE Order 151.1C, *Comprehensive Emergency Management System*. This year's scenario was a postulated nuclear criticality in one of the machining laboratories involving two injured workers that required extraction from the air lock. Participants noted several areas for improvement, including strengthening the procedures that guide the response of the criticality safety group. Notably, facility management requested a follow-on tabletop exercise to work through evaluation and recovery of the facility to include a discussion on the use of robots. The Site Representative observed noticeable improvement compared to last year (see 4/18/14 weekly) with the integration between facility management, fire department, and emergency management personnel, likely driven by the recent initiation of routine drills involving the Facility Incident Command. LANL expects to conduct another exercise with a different scenario at the Plutonium Facility later this year.

Plutonium Infrastructure Strategy: On May 19, 2015, the Field Office approved with direction the Safety Design Strategy (SDS) for upgrading the Radiological Laboratory Utility Office Building to a new Hazard Category 3 nuclear facility. The SDS will be part of the package NNSA leadership will use to soon decide whether to proceed with the upgrade effort. Field Office direction concerned the use of the DOE Order 420.1 C, *Facility Safety*, vice its predecessor document and expectations regarding hazards analysis for seismic events and natural gas explosions. Separately, the Field Office provided comments on the SDS for the PF-4 Active Confinement Ventilation System upgrade project (see 3/6/15 weekly). Notably, the Field Office directed LANL to specify DOE Order 420.1C as the code of record for the project and use the seismic design performance categories as specified in DOE-STD-1189, *Integration of Safety into the Design Process*.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 29, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 29, 2015

Plutonium Facility–Criticality Safety: On Wednesday, the Field Office approved LANL’s request to extend the Evaluation of the Safety of the Situation/Justification for Continued Operations (ESS/JCO) concerning the potential for nuclear criticality due to firewater intrusion (see 6/6/14 weekly). The new expiration date is May 30, 2016. In their approval, the Field Office noted that their performance expectations have not been met in that the original ESS was approved over a year ago and still has not been completely implemented. The Field Office further directed LANL to:

- Submit the Nuclear Criticality Safety Program Upgrades Project Plan for approval by July 10, 2015
- Submit safety basis changes referencing the approved plan by November 30, 2015
- Implement the revised safety basis prior to expiration of the extended ESS/JCO

Plutonium Facility–Restart: Facility personnel continued the second week of the management self-assessment for Pit Flowsheet operations. These operations include the various welding, assembly, and inspection activities needed to produce a pit for the stockpile. LANL management hopes to accelerate the start of the contractor readiness assessment to late July. The baseline schedule shows a request for restart authorization by January 5, 2016.

Area G–Conduct of Operations: Area G personnel have recently exhibited some difficulty properly managing technical safety requirements (TSR). In one instance, operators in the operations center were unaware of the fact that the TSR limit for composite source term material-at-risk was currently exceeded (see 5/8/15 weekly). Although the operators were aware that transuranic waste shipments were on hold, they did not know that this was the result of facility management direction to enter the associated limiting condition for operation (LCO) action statement. The Site Representatives believe that the following contributed to this event:

- Weaknesses in the process for how facility management notifies operations personnel of changes in facility status
- A poorly written LCO
- Failure of the system used by operations personnel to track material-at-risk limits to indicate that the composite source term limit was exceeded
- A shift turnover process that does not ensure operators are informed of facility conditions

This week, operations personnel chose to first inspect the storage area rather than entering the appropriate LCO after the material-at-risk tracking system indicated that numerous waste drums in the storage area were non-compliant. LANL management has indicated that a senior supervisory watch will be stationed to assist and mentor operations personnel in proper implementation of the TSRs and that a review will be performed of the process used by management to inform operations personnel of changes in facility status.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 5, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 5, 2015

DNFSB Staff Activity: D.K. Andersen, R.L. Jackson, and J.L. Shackelford were onsite this week to receive an overview of design and construction activities associated with Plutonium Infrastructure Strategy, attend safety basis training, and discuss the Chloride Extraction and Actinide Recovery process.

Safety Basis: On Monday, LANL transmitted to the Field Office for information an updated version of the Safety Basis Improvement Plan. Notable future deliverables include: (1) a revised staffing analysis; (2) instituting the Safety Task/Action Tracker for the New Information process; (3) incorporating the “Do it Right the First Time” storyboarding for the development of safety basis deliverables; (4) updating the Technical Safety Requirements for each facility to incorporate material-at-risk applicability statements, limiting conditions for operations-like action statements and completion times, operability determinations/performance criteria to facilitate placing credited design features out-of-service for maintenance or emergency exercises (5) studying the need for similar action to #4 for Specific Administrative Controls; and (6) ensuring security and emergency exercise/drill plans are evaluated through the Unreviewed Safety Question process.

Plutonium Facility–Safety Systems: Last Thursday, LANL provided the NNSA Deputy Administrator for Defense Programs with their scope analysis and recommendations for Phase III of the TA-55 Reinvestment project. In accordance with NNSA direction, LANL considered the following sub-projects: (1) fire alarm system replacement, (2) upgrading the active confinement ventilation system to safety class, and (3) separating non-seismically qualified structures from the safety class fire water supply loop. Of the three subprojects, LANL recommended only pursuing the fire alarm system replacement based on increased cost estimates, completion of structural modifications and implementation of operational practices to reduce risk in recent years, and the potential to transfer programmatic activities to future modular additions. The briefing notes that repair/update of the ventilation system will be required independent of the active confinement decision. NNSA management is expected to make a decision within the next month.

Area G–Safety Basis: Field Office, DOE-EM, and LANL personnel conducted several meetings this week to discuss the validity of crediting the pipe overpack containers (POC) with a damage ratio of zero, as indicated in DOE-STD-5506 (see 5/15/15 weekly). The experimental basis referenced in DOE-STD-5506 includes a single fire test performed with four POCs in 1997. Three of the POCs utilized polyethylene-housed drum filters and the fourth used a metal-housed drum filter (note that there is a separate metal-housed filter on the pipe component on all POCs). During the test, the poly housing failed, which provided a sufficient vent path for fire insulation to off-gas. The pipe components in these containers were unaffected and experienced peak temperatures of less than 200 °F. In contrast, the metal housing did not fail and pyrolysis products pressurized the drum sufficient to blow off the lid within three minutes. This resulted in direct exposure of the pipe component to the fire and subsequent degradation of the pipe O-ring and filter gasket. LANL has exclusively utilized the metal-housed filters causing Federal personnel to question the use of a damage ratio of zero. The Field Office has enquired about using the poly filters or a plastic bung plug as a type of fusible vent path.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 12, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 12, 2015

DNFSB Staff Activity: On Wednesday, E.M. Gibson conducted a teleconference with LANL and NNSA personnel to discuss the status of efforts on the 2017 update to the probabilistic seismic hazards analysis.

Plutonium Facility–Restart Activities: Members of federal readiness assessment (RA) team for the Balance of Machining activity conducted their pre-visit this week. They plan to commence their full review on June 22, 2015. On Monday, the contractor RA team commenced their review of the Isotope Fuels Impact Tester. Last Friday, LANL submitted their request for startup approval and the associated corrective action plan for closure of the findings from the federal RA for the T Base 2 machining activity.

Plutonium Facility–Configuration Management and Conduct of Operations: On Monday, facility personnel conducted a fact-finding after the NNSA Facility Representative questioned the conduct of a liquid transfer. Workers had transferred liquid to facilitate sampling of one of the liquids of unknown origin (see 4/3/15 weekly). Participants discussed concerns regarding performance of the transfer using a procedure that expired a year earlier and did not include valve lineups, as required by institutional procedure. The workers noted that they have not historically used valve lineups to support liquid transfers due to the complexity of the system and the fact that most transfer piping and valves in the facility do not possess unique identifiers and are not captured in controlled engineering drawings. Instead, the practice had been to conduct a group walk-down to ensure the correct transfer path. Facility management indicated future transfers would need to rely on completion of formal labeling for enduring systems and use of temporary labeling for those systems planned for removal.

Plutonium Facility–Safety Basis: On Wednesday, LANL personnel briefed the Field Office on the state of the safety basis and their proposed remedy. The situation includes: three approved safety basis documents, with only the 2011 version fully implemented; four safety documents that have been submitted, but are not yet approved; and at least six known changes to be submitted in the near future. LANL's proposed remedy is to discontinue implementation efforts for the 2014 documents while pursuing at-risk implementation of the 2015 version, which they submitted to the Field Office in late May. Assuming timely approval from the Field Office, LANL hopes to have the 2015 version implemented in early fall. They anticipate the need to submit a future revision to the 2015 version that will further consolidate outstanding documents and comments.

Area G–Conduct of Operations: Last week, in response to a number of recent conduct of operations issues (see 5/29/15 weekly), LANL management appointed a senior supervisory watch (SSW) for Area G, the RANT Shipping Facility, and the Waste Characterization, Reduction, and Repackaging Facility. The SSW commenced his duties this week, which include critical and objective oversight of operations and mentoring to operations personnel. LANL management is continuing to study the need for improvements on how management communicates safety basis and facility status decisions to operations staff.

Weapons Engineering Tritium Facility (WETF): WETF personnel successfully loaded a Flanged Tritium Waste Container with about 5000 Ci of tritium-containing materials. This evolution was conducted to support risk reduction activities and maintain proficiency ahead of the one-year anniversary from the last evolution (see 6/20/14 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 19, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 19, 2015

Area G–Safety Basis: On Thursday, Field Office, DOE-EM, and LANL personnel discussed the status and path forward regarding the Potential Inadequacy of the Safety Analysis concerning the composite source term (see 6/5/15 weekly). LANL personnel presented the result of an extent-of-condition review on the composition of the existing waste. They now believe that the 3.1 percent combustible fraction assumed in the approved safety basis for the aboveground waste population should actually be 12.2 percent and will use 20 percent in future analyses as a bounding value. This change affects 17 of the 29 design basis accidents, which includes nine that have unmitigated doses in excess of the Evaluation Guideline. LANL analysts presented their preliminary analysis indicating that five additional operational restrictions (beyond the current prohibition of new receipts) are necessary to mitigate these accidents, except for the aircraft crash, to acceptable levels. These restrictions involve reduced material-at-risk limits and all but one are currently reflected in the as-found configuration of the site. Area G management expects to relocate inventory from one of the domes to implement all the restrictions and then formally protect them via standing order.

LANL analysts also presented a case for moving forward with a few new additional controls to accept receipt of newly generated wastes (with a limit of 5000 plutonium-239 equivalent curies) from the Plutonium Facility as part of a revised Evaluation of the Safety of the Situation. If approved, the transfer would likely allow a few extra months of waste generation, though personnel did not provide specific projections. LANL anticipates submitting the revision in mid-July and estimates the ability to resume waste receipts at Area G this September.

Plutonium Facility–Restart Activities: On Thursday, the contractor readiness assessment (CRA) team out-briefed the results of their review of the Isotope Fuels Impact Tester. The team found that all 21 objectives were met, but identified seven pre-start and 16 post-start findings. The findings generally included issues with procedures, postings, training, drill program execution, and a suspended load path above an operator's limbs.

Weapons Engineering Tritium Facility (WETF): This week, a CRA team commenced and completed their review of UC609 shipping container operations. The UC609 is currently the only certified container available to ship bulk quantities of tritium, which WETF personnel will need to support risk reduction efforts later this year. The CRA team found that all 17 objectives were met, but identified four pre-start findings and one post-start finding. The findings involved procedure content, procedure execution, glove removal, and a suspended load path above an operator's limbs.

Nuclear Criticality Safety: On Tuesday, the institutional Nuclear Criticality Safety Committee (NCSC) convened for the first time after the LANL Director approved a revised charter on May 28, 2015. The new charter, which is the third in three years, seeks to improve the group's work by emphasizing field observations. The NCSC issued a work plan that includes five fieldwork activities. Additionally, the NCSC leader has gained unescorted access to the Plutonium Facility and has initiated observations related to criticality safety related events (e.g., fact-findings, worker training, interactions with operations).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 26, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 26, 2015

DNFSB Staff Activity: Z.S. Beauvais augmented the Site Representative office this week and observed portions of the federal readiness assessment (RA) for Balance of Machining activities.

Plutonium Facility–Restart Activities: On Monday, the federal RA team commenced their review of the Balance of Machining activities. Their review is expected to conclude on July 1st. Notably, in their report documenting verification of prerequisites, the Field Office included a caveat that while the actions taken and closure documentation for the contractor’s RA were adequate for commencing the federal RA, the plan and execution were not currently adequate to approve operations and would be carried forward as a manageable pre-start. The Field Office report states that numerous and widespread concerns with the post-start corrective actions contributed to this decision, such as actions not addressing causal factors and superficial extent-of-condition reviews. Separately, the management self-assessment team completed their review of the Pit Flowsheet activity. The contractor plans to conduct their RA at the end of August.

Area G–Nitrate Salts: On Thursday, the Field Office directed LANL to consider the profusion of New Information relative to the safety basis for continued safe storage of the remediated nitrate salts contained in the DOE Accident Investigation Board and the Technical Assistance Team reports on the radiological release at the Waste Isolation Pilot Plant. In particular, the Field Office stated that these sources provide information suggesting that an accident of a different type occurred and with a greater airborne respirable release fraction than assumed in the existing safety basis. These changes have the potential to increase significantly the consequences and therefore may warrant additional compensatory measures. The Field Office requested LANL’s evaluation and any subsequent safety basis changes for approval within 60 days.

Emergency Management: Last Thursday, LANL personnel conducted an exercise utilizing their alternate Emergency Operations Center (EOC). LANL’s alternate EOC is a mobile capability that they can establish at any road accessible location. In last week’s exercise, they setup the EOC in one of three pre-determined locations in the town site.

Work Control: This week, the Associate Director for Nuclear and High Hazard Operations (ADNHHO) issued a memorandum to all facility operations directors (FOD) outlining expectations for necessary improvements in the formality of work operations. This direction follows a number of recent incidents relating to poor work control practices, the most recent of which involved an event last Monday where a maintenance worker contacted and subsequently brought down a 13.8 kV powerline with his dump truck. Following this incident, LANL management paused all maintenance work activities for a one day safety stand-down. Areas specifically identified by the ADNHHO for needed improvement include: (1) oversight and control of work execution; (2) person-in-charge responsibilities for the validation, coordination, execution and proper closeout of the activity; and (3) pre-job briefings to ensure workers clearly understand their scope of work and associated hazards prior to commencing work. The memorandum reiterates the roles and responsibilities of all levels of management for the safe accomplishment of work, and includes additional expectations for the FODs when reviewing work documents and subsequently releasing work.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 3, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 3, 2015

DNFSB Staff Activity: On Tuesday, the Site Representatives briefed the results of their efforts to identify opportunities to reduce risk at the Plutonium Facility via actions associated with material-at-risk to Field Office and LANL management. Overall, the Site Representatives identified that 21 percent of the material-at-risk on the laboratory floor has been idle for more than three years, leading to questions regarding whether this material could either be eliminated from the facility or moved to hardened storage locations such as the vault or safes. In addition, the Site Representatives identified opportunities that site personnel could explore to improve the utilization of certified containers and strengthen practices for the lifecycle management of nuclear materials.

Plutonium Facility–Nuclear Materials Management: Last month, Plutonium Facility personnel initiated a six-sigma improvement effort to streamline the process to select and log containers used to store nuclear materials within gloveboxes. Management directed this effort as a corrective action from a fact-finding associated with improperly selecting a container type in the nuclear material management database (see 4/24/15 weekly). This effort has the potential to remedy some of the container issues identified by the Site Representatives. For example, only about 13 percent of the containers in use are specified in the database as certified to reduce the radiological source term generated from certain insults.

Plutonium Facility–Restart Activities: On Wednesday, the federal readiness assessment (RA) team completed their review and delivered their report for the Balance of Machining activities. The team presented six pre-start and seven post-start findings. Notably, in addition to the findings, the team recommended that an independent federal team perform an assessment of facility implementation of the criticality safety program prior to commencing the ARIES/Furnace/Casting contractor RA scheduled for December 2015.

Area G–Safety Basis: On Wednesday, LANL responded to an NNSA extent of condition data request for information regarding the use and performance assumptions for pipe overpack containers (POC). This request followed a LANL submittal of an Evaluation of the Safety of the Situation/Justification for Continued Operations (ESS/JCO) that proposed crediting POCs with a damage ratio (DR) of zero as indicated in DOE-STD-5506 (see 5/15/15 weekly). Following several meetings, NNSA, DOE-EM, and LANL personnel determined that a DR of zero for the POCs is not technically defensible. The response to the request for information indicates that LANL currently has five facilities that package, ship, and/or stage POCs. None of these facilities currently credit the POC with a DR of zero; however, the Plutonium Facility is currently using a DR of 0.1 and Area G and the RANT Shipping Facility are approved, but not implemented, to use a DR of 0.1. Additionally, the Transuranic Waste Storage Facility, currently under construction, had planned to use a DR of zero.

Largely due to the conclusion that applying a damage ratio of zero to the POCs is inappropriate, the Field Office has yet to approve the ESS/JCO submitted on May 14, 2015. LANL is expected to withdraw and resubmit a revised ESS/JCO in mid-July. Subsequent to additional review of the technical safety requirements, Area G management determined that it is appropriate to enter the generic limiting condition for operation that requires the facility to shift to a safer mode. As such, operations personnel commenced transitioning Area G to warm standby yesterday.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 10, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 10, 2015

DNFSB Staff Activity: On Thursday, D.K. Andersen, D.J. Campbell, P.J. Foster, and R.L. Jackson conducted a teleconference with LANL and field office Transuranic Waste Facility project personnel to follow up on construction quality issues identified during a prior DNFSB staff review (see 5/15/15 weekly).

Area G–Fire Protection: This week, crews initiated remedial actions under the vegetation control element of the Fire Protection Program. These remedial actions included brush and vegetation removal, and were taken in response to results of last month’s required periodic inspection. The inspection indicated all Defined Areas within Area G had unsatisfactory control of grasses and weeds, 4 had unsatisfactory control of shrubbery, and 4 of the primary waste storage domes had grass and weeds growing on all sides. Additionally, all of the defensible areas outside of the fence had grass, weeds, and shrubs within their clearance areas. Of note, the Fire Protection Program vegetation control element is credited as an administrative control in the Area G safety basis to reduce the frequency of certain design basis accidents.

Area G–Nitrate Salts: Area G personnel are in the process of installing increased capacity cooling equipment for the Dome 375 Permacon (see 4/3/15 weekly). This is a significant modification, to include installation of a large chilling unit, associated piping and electrical connections, and additional cooling coils within the Permacon’s existing ventilation ducting. This effort is a compensatory measure to provide improved cooling of the remediated nitrate salt waste, while also serving as a backup for the primary systems were they to fail.

Plutonium Facility–Restart Activities: This week, LANL submitted, and the field office concurred on, a revised corrective action plan for the previously completed Balance of Machining contractor readiness assessment. The plan was revised to address field office concerns that corrective actions in the initial submittal were inadequate to fully address all post-start findings (see 6/26/2015 weekly). On Wednesday, the management self-assessment team issued the final report of their Pit Flowsheet activity review and concluded that upon satisfactory resolution of identified pre-start findings, Plutonium Facility personnel could safely support Pit Flowsheet operations. The contractor and federal readiness assessments for Pit Flowsheet are scheduled for August and October of this year respectively.

LANL Management Responsibilities: On Tuesday, the LANL Director communicated his expectations for management responsibilities in support of employee safety and security to all LANL personnel. This direction follows a number of recent safety and security incidents that have highlighted a need for improvement in these areas. The Director emphasized that there is nothing more important than ensuring every reasonable step is being taken to ensure workforce safety and security. The mechanisms through which these steps are expected to be accomplished include a visible and active leadership presence in the field and increased access to Environment, Safety, and Health experts. In addition to communicating the expectation for increased presence in the field, training on how to effectively observe activities and communicate observations was provided to the leaders expected to perform these duties.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 17, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending July 17, 2015

DNFSB Staff Activity: On Wednesday, D.K. Andersen, B.K. Caleca, R.L. Jackson, A.P. Poloski, and J.L. Shackelford conducted a teleconference with Field Office and LANL personnel in an attempt to identify the technical basis associated with LANL's recommendation to de-scope the upgrade of the Active Confinement Ventilation System for the Plutonium Facility (see 6/5/15 weekly).

Weapons Engineering Tritium Facility–Configuration Management: On Monday, facility personnel conducted a fact-finding following the declaration of a Potential Inadequacy of the Safety Analysis (PISA) associated with the uninterruptible power supply (UPS) to a portion of the oxygen monitoring system (OMS). Specifically, as part of troubleshooting an error message, the system engineer discovered one of the safety significant OMS appliances to be plugged into the non-UPS power strip on its instrument rack. Notable points discussed include the following: (1) unlike other UPS outlets in the facility, this UPS strip had no obvious indication (e.g., red color receptacles) and was identical in appearance to the non-UPS strip located next to it; (2) the work package used to install this appliance in March 2014 specified only to ensure the cord reached the UPS strip, rather than ensure that workers connected it with the UPS strip specified by its identifier; (3) the previous version of the Technical Safety Requirements for the OMS included an operability statement associated with UPS power; however, this requirement was removed in the current version and apparently was never translated into a specific surveillance action; and (4) there is not a configuration managed list of safety loads to the UPS. Facility management directed an extent of condition review for the tritium monitoring system, which also uses safety significant plug-in appliances required to be on the UPS.

Waste Characterization Remediation and Repackaging Facility–Maintenance: On Monday, facility personnel conducted a fact-finding regarding the PISA associated with degradation of the facility roof resulting from flooding. Last week, after observing standing water within the facility, personnel observed about 8–10" of standing water on the roof and requested a priority maintenance response. The facility is currently in COLD STANDBY mode. Maintenance personnel resolved a plug in the roof drain and performed mitigation efforts within the facility. Notable points discussed include the following: (1) no preventive maintenance routines are currently in place for the roof; (2) management initiated a work order for corrective maintenance to repair the leaking roof in October 2014; however, the package was never finalized; and (3) a separate effort to replace the roof this spring was cancelled due to conflicting construction in the area. The Site Representatives note that the formal in-service inspection does not explicitly direct review of roof drains and that effective drainage is necessary to prevent the accumulation of rain and snow loads that may exceed the structure's design basis. Facility management is working to replace or repair the roof, initiating additional repairs for damage to the drywall ceiling, increasing the frequency of rounds while in COLD STANDBY, and starting qualification processes to increase the number of operators for these rounds to more than one.

Plutonium Facility–Emergency Management: On Thursday, Plutonium Facility management participated in a tabletop exercise with Los Alamos Fire Department and LANL emergency management and security personnel to work through evaluation and recovery of the facility following a criticality accident (see 5/22/15 weekly). Participants identified a number of meaningful improvements and worked through potential pitfalls of managing the recovery following the initial evacuation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 24, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 24, 2015

DNFSB Staff Activity: J.L. Shackelford was at LANL this week to perform site cognizant engineer familiarization activities. On Thursday, C. Berg, M.W. Dunlevy, R.C. Eul, and N.M. George conducted a teleconference with Field Office and LANL personnel regarding the remediated nitrate salt (RNS) wastes.

Plutonium Facility–Restart Activities: In a letter dated July 16, 2015, the Field Office approved the restart of nuclear operations associated with the T Base II machining activity. Operations personnel intend on machining a plutonium part before the end of the fiscal year. The ability to perform additional machining operations is currently constrained by limited availability of suitable feed materials and dependent on successful restart of predecessor and downstream activities.

Area G–Nitrate Salts: On Friday, the NNSA Field Office provided LANL relief from the technical safety requirements related to the WARM STANDBY mode condition resulting from the composite source term issue (see 7/3/15 weekly). Specifically, Field Office direction allows Area G personnel to: (1) sample the seven drums containing cemented inorganic wastes known to contain liquid; (2) perform real-time radiography of approximately 150 similar drums that may contain liquid; (3) sample the unremediated nitrate salts currently stored in the Dome 231 Permacon; and (4) conduct other activities needed to support the above actions. The first two actions mainly facilitate resolution of outstanding environment compliance issues and the third action facilitates development of the safety basis for final treatment of the RNS wastes. The Field Office also directed LANL to doublepack the four pipe overpack containers currently containing RNS wastes (containing water absorbent polymer rather than wheat-based cat litter) and prohibited LANL from crediting reductions in damage ratios for the pipe overpacks.

Plutonium Infrastructure Strategy: On July 10, 2015, LANL transmitted the revised safety design strategy for the upgrade of the Radiological Laboratory Utility Office Building to a Hazard Category 3 nuclear facility (see 5/22/15 weekly). LANL is now referring to the future facility as the Nuclear Laboratory/Office Building (NLOB). LANL included in the submittal an applicability matrix for DOE Order 420.1C, *Facility Safety*. NNSA management has yet to decide on moving forward with the NLOB.

Area G–Conduct of Operations: The newly assigned Senior Supervisory Watch (see 6/12/15 weekly) recently completed a review of Area G standing orders, abnormal operating procedures, and emergency procedures. He identified a number of opportunities for improvement that will help streamline the large number of currently open standing orders and bolster operator response to emergency and abnormal conditions.

Safety Basis: LANL safety basis personnel have completed their review of new information related to assignment of damage ratios for pipe overpack containers in various safety bases (see 7/3/15 weekly). As a result, LANL management declared Potential Inadequacies of the Safety Analysis for the Plutonium Facility, Area G, the RANT Shipping Facility and the Waste Characterization Reduction and Repackaging Facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 31, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 31, 2015

DNFSB Staff Activity: Deputy Technical Director R.E. Tontodonato augmented the Site Representative office.

Emergency Management: This week, LANL hosted their annual HAZMAT Challenge. New for this year, LANL organizers added event stations in the Center for Emergency Planning and Analysis (CEPA) facility, in addition to stations at the Technical Area 49 training grounds. The CEPA is a large, high-bay facility that houses a system of movable walls supported by a wire grid structure beneath monitoring platforms. This arrangement allows organizers to replicate various facility environments for emergency response and protective force training. Organizers used the CEPA for stations associated with responses to scenarios involving radiological materials, hazardous chemicals, and biological agents. Notably, organizers designed the stations to minimize simulation and fully utilize actual response protective equipment, self-contained breathing apparatus, and detection gear. Challenge participants included two teams from Los Alamos County, the auxiliary LANL team, the city of Santa Fe, Sandia National Laboratories, the National Guard, and several other entities from around the region.

Waste Characterization Reduction Repackaging Facility: On Thursday, LANL resubmitted to the NNSA Field Office the annual update to the safety basis. The new submission corrects issues with the October 2014 submittal regarding the hazards associated with nitrate salts and other oxidizers.

Weapons Engineering Tritium Facility (WETF)–Restart Activities: On Monday, a contractor readiness assessment (CRA) team commenced their review of WETF operations. The team is evaluating WETF readiness to commence gas transfer operations in order to maintain facility safety/operability and to disposition legacy nuclear material-at-risk. This CRA is a reperformance of a CRA conducted last September that determined facility performance was insufficient to ensure gas transfer and associated operations could be safely and compliantly performed (see 9/19/2014 weekly). This week, the CRA team observed facility personnel simulating gas transfer operations, conducted interviews and performed document reviews. The assessment is scheduled to conclude next week.

WETF–Safety Systems: On Tuesday, during surveillances WETF personnel observed degraded performance associated with two safety systems requiring entry into their associated technical safety requirement (TSR) action statements. In the first instance, a fire riser pressure gauge was oscillating above and below the TSR required limit, with the average of the oscillation below the limit. Operators took appropriate actions and stationed a fire watch. During investigation into the cause of the oscillations, WETF personnel noted that the three-way gauge isolation valve was incorrectly installed. Maintenance personnel replaced the gauge and the valve and satisfactorily retested the system on Thursday. In the second instance, operators observed a tritium monitor indicating higher than expected tritium levels that failed a subsequent performance test. Again, operators took appropriate actions and later replaced the tritium monitor and retested it satisfactorily.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 7, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending August 7, 2015

DNFSB Staff Activity: R.K. Verhaagen attended training on safety basis development and review at DNFSB Headquarters.

Weapons Engineering Tritium Facility (WETF)–Restart Activities: On Friday, the contractor readiness assessment (CRA) team out-briefed the results of their assessment of tritium gas transfer operations. The team identified 12 findings, noted “dramatic” improvement in facility operations, and concluded that all 17 review objectives were met. The team concluded that the facility was ready to safely operate, subject to satisfactory closure of all pre-start findings. Notable findings included:

- A non-conservative discrepancy between the procedure and the associated engineering calculation related to the volume of a tank and its associated manifold piping
- Procedural execution issues important to Conduct of Operations compliance
- A significant fraction of wet pipe sprinkler maintenance has been deferred or cancelled in the past eight months
- Implementation of issues management and corrective actions do not meet contractor assurance system and quality assurance requirements
- Gaps in the implementation of software quality assurance call into question the readiness of safety software to support restart of operations

The federal readiness assessment is currently projected to start September 28, 2015.

WETF–Emergency Management: On Tuesday, WETF personnel conducted an emergency exercise for the CRA team to observe. The scenario involved an operator performing leak checks who falls from an elevated location, tears a glove creating a low-level tritium release, and sustains a broken arm. Exercise participants and CRA team members noted generally positive views compared to past performance and attributed this improvement to the benefits from the approximately dozen training drills conducted this year. However, based on observation of operations center response and comments from the participants, the CRA team noted that management should place additional emphasis on streamlining the communications process in order to prioritize the exchange of safe approach information from the operations center to the responding units from the fire department. The CRA team could not find a specific requirement related to this concern in DOE Directives or national consensus standards, but nonetheless emphasized the importance of ensuring timely emergency response.

Plutonium Infrastructure Strategy: This week, facility management increased the material-at-risk limit for the Radiological Laboratory Utility Office Building (RLUOB) from 8.4 to 38.6 g of plutonium-239 equivalent. The change in limits was facilitated by implementation of the new limits for a radiological facility using the NNSA Supplemental Directive Guidance 1027, *Guidance on using Release Fractions and Modern Dosimetric Information Consistently with DOE-STD-1027, Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports, Change Notice No 1*, May 2014. This increase represents an important step towards establishing a capability and capacity for analytical chemistry activities necessary to terminate operations in the aging Chemistry and Metallurgy Research building.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 14, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending August 14, 2015

Transuranic Waste Management: Senior managers from the NNSA and EM Field Offices, NNSA and EM Headquarters, the Carlsbad Field Office, and LANL conducted a day and a half workshop on transuranic waste management issues. The overarching objective of the workshop was to achieve alignment amongst these parties in the midst of an extremely complex situation that includes establishing the EM bridge contract, resolving numerous safety basis issues, treating the remediated nitrate salt wastes, and the inability of the Waste Isolation Pilot Plant (WIPP) to receive wastes. Of likely interest to the Board, LANL analysts currently forecast the potential for transuranic waste accumulation to reach the site's total estimated storage capacity, including Area G, TA-55 and the yet to be completed Transuranic Waste Facility, in approximately fiscal year 2017. The key drivers for this forecast are WIPP availability and safety basis limits for Area G. The vast majority of waste generation stems from key risk reduction activities at the Plutonium Facility and the Chemistry and Metallurgy Research (CMR) building. These activities include residue processing and vault cleanout activities under the Material Recycle and Recovery program, legacy equipment and materials cleanout for plutonium-238 operations, Confinement Vessel Disposition operations, and removal of legacy gloveboxes and equipment required to implement the Plutonium Infrastructure Strategy and cease operations at CMR.

Area G–Nitrate Salts: On Thursday, Area G personnel executed the NNSA Field Office direction to doublepack the four pipe overpack containers holding remediated nitrate salt wastes into standard waste boxes (see 7/24/15 weekly). These containers were remediated with absorbent polymer material rather than wheat-based cat litter. Area G personnel were able to perform this directed action using the relief granted from the Technical Safety Requirements to allow certain portions of the facility to temporarily return to OPERATIONS mode.

Plutonium Facility–Restart Activities: A federal readiness assessment team out-briefed the results of this week's review of the Isotope Fuels Impact Tester. This is the third in a series of readiness assessments necessary to resume all operations in the Plutonium Facility. The team found that all objectives were met, identified no pre-start and three post-start findings, and recommended IFIT operations should be allowed to restart. The post-start findings involved issues with the lack of a formalized operational drill program, obstructed sprinkler heads, and cognizant system engineer training. Of note, the team commended the operational excellence with which operators and their immediate management displayed.

Plutonium Facility–Seismic Safety: On Monday, following direction from NNSA Headquarters, the NNSA Field Office transmitted to LANL a letter identifying necessary actions to address a report developed by the Plutonium Facility Seismic Expert Panel (see 11/7/2014 weekly). One identified action includes the intent to establish a joint NNSA and LANL working group to develop a Request for Proposal to procure a final state-of-the-art analysis to evaluate whether the Plutonium Facility meets seismic performance requirements. Additionally, the NNSA Field Office directed LANL to perform a cost benefit analysis of suggested testing and facility upgrades, and to submit within 90 days a plan to address the remaining issues identified in the panel's report.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 21, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending August 21, 2015

DNFSB Staff Activity: J.W. Plaue was out of the office this week to attend training on root cause analysis and incident investigation.

Area G–Safety Basis: Senior managers from EM headquarters and the EM and NNSA field offices met with LANL personnel this week to discuss the proposed path forward with necessary safety basis changes to allow limited transuranic (TRU) waste receipts and a return to OPERATIONS mode in Area G. Currently all waste receipts are on hold due to exceedance of composite source term (CST) material-at-risk (MAR) limits (see 5/8/15 weekly). LANL has developed a draft Evaluation of the Safety of the Situation/Justification for Continued Operations (ESS/JCO) that will lower overall facility MAR limits and replace the CST limit with new limits on combustible waste. Additionally, LANL performed a new accident analysis for the 17 design basis accidents affected by the CST issues, which is included as an appendix to the ESS/JCO. A team comprised of EM and NNSA safety basis experts is reviewing the ESS/JCO and expect to complete their review in approximately two weeks.

Area G–Operations: This week, Area G operations personnel transitioned the facility from WARM STANDBY to OPERATIONS mode to permit various sampling activities to be performed on seven drums containing cemented inorganic wastes known to contain liquid. This is the second in a series of activities directed by the Field Office (see 7/24/15 weekly) to improve the safety posture of Area G while the facility is in WARM STANDBY mode due to the CST issue.

Plutonium Facility–Safety Basis: On Monday, the Field Office manager signed the safety evaluation report approving LANL’s submittal of a revision to the 2014 Plutonium Facility documented safety analysis. Of significance, this revision allows storage of TRU waste containers on designated pads located outside of the facility. Use of these waste storage pads will increase TRU waste storage capacity necessary for ongoing Plutonium Facility operations. This is important as TRU waste storage within the facility is nearing technical safety requirement MAR limits and disposal to Area G is curtailed.

The field office manager also recently approved the closure of an ESS for ammonium nitrate in the plutonium facility ventilation system (see 7/9/10 weekly). The approval letter notes that improvements made to door seals and glovebox exhaust systems, as well as rerouting of ventilation ductwork, has adequately segregated the source of the ammonium nitrate from the ventilation system.

Confinement Vessel Disposition Project: Chemistry and Metallurgy Research (CMR) building operators have completed cleaning out the second of ten confinement vessels stored at TA-55 that have been slated for disposition. The third vessel will not be transported from TA-55 to CMR for cleanout until necessary safety basis changes are implemented and the TRU waste generated from cleanout of the previous two vessels can be shipped out of the facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 28, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending August 28, 2015

DNFSB Staff Activity: J.L. Meszaros observed LANL's independent assessment per DOE-STD-1158 of the nuclear criticality safety program at the Plutonium Facility. On Tuesday, a staff team lead by C. Berg and M.W. Dunlevy conducted a teleconference with NNSA Field Office, EM Field Office, and LANL personnel to discuss a range of safety basis topics associated with the remediated nitrate salt wastes and Area G.

Plutonium Facility–Restart Activities: On Thursday, machinists utilized the recently authorized T-Base II lathe to make a few cutting passes on a plutonium part sufficient to exercise the procedure, including the management of turnings. In accordance with the approved startup plan, a Senior Supervisory Watch and an independent group leader provided management oversight of the activity.

RANT Shipping Facility: In a letter to LANL management dated August 26, 2015, the NNSA Field Office noted numerous and significant deficiencies with the 2015 annual update to safety basis, which is currently in the form of a Basis for Interim Operations (BIO). However, the Field Office acknowledged that the BIO was sufficient to support continued operations under COLD STANDBY. The Field Office further directed that the facility remain in that mode until: (1) the previously identified seismic vulnerabilities are resolved (see 1/30/15 weekly) and (2) the facility implements an approved DOE-STD-3009 compliant Documented Safety Analysis consistent with its enduring facility status. The Field Office did not specify a version of DOE-STD-3009.

Weapons Engineering Tritium Facility–Safety Basis: On Monday, LANL submitted to the NNSA Field Office an Evaluation of the Safety of the Situation (ESS) addressing the Potential Inadequacy of the Safety Analysis declared for the discovery of safety significant oxygen monitor system (OMS) modules plugged into the incorrect power source (see 7/17/15 weekly). In the ESS, LANL noted that workers switched the power source for the modules to the required uninterruptable power supply and satisfactorily completed the appropriate surveillances to verify operability. As such, LANL suggested that no additional operational restrictions are necessary to place the facility in a safe condition and requested approval of the ESS without any required actions.

On Wednesday, LANL submitted to the NNSA Field Office a revision to the ESS for the potential for increased probability of OMS failure (see 11/9/13 weekly). With the submittal of this revision, LANL is requesting to reduce the frequency of OMS calibration surveillances from monthly to quarterly. Accompanying the ESS is a calculation that uses sixteen months of recorded calibration data to demonstrate that sensor lifetime is at least three months.

Emergency Management: On Thursday, LANL personnel conducted a second fact-finding associated with the lapse of Emergency Responder Radiological Training (ERRT) for members of the Los Alamos County Fire Department (LACFD). About two weeks ago, while responding to an external audit, LANL personnel discovered that the ERRT for more than a hundred LACFD personnel had expired around March 2015. LACFD personnel are in the process of completing the training. LANL personnel uncovered several weaknesses in the processes used to monitor and convey training status to LAFD and are examining the extent of condition.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 4, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending September 4, 2015

DNFSB Staff Activity: R.K. Verhaagen attended hazard analysis training at DNFSB Headquarters.

Plutonium Facility–Nuclear Criticality Safety: On Thursday, LANL's independent assessment team outbriefed the results of their review of the nuclear criticality safety program and its implementation at the Plutonium Facility. The 15-member team conducted their review using DOE-STD-1158 and included observation of seven fissionable material evolutions and three relevant meetings. Overall, the team noted improvements in the formalization of criticality safety on the floor, worker adherence to procedure, and the relationship between operations staff and criticality staff. As outbriefed, the team identified three noteworthy practices, nine findings, and 22 observations. Findings and observations of note include: (1) some employees involved with operations using fissile material were not familiar with the criticality safety policy; (2) out of service equipment still connected to active systems are not evaluated to determine frequency for review; (3) procedures do not adequately implement all requirements of the institutional directive on conduct of operations; (4) there is not a clear and consistent understanding of the training requirements for a person in charge; and (5) the review process for the fire department's pre-incident plan does not ensure review by criticality safety personnel.

Safety Basis: On Thursday, LANL safety basis management submitted to the NNSA Field Office for approval three Evaluation of the Safety of the Situation (ESS) documents related to the use of damage ratios (DR) for pipe overpack containers (POC) at the Plutonium Facility, Area G, and the RANT Shipping Facility (see 7/24/15 weekly). For a POC in a fire event, the existing technical basis for a DR relies on four fire tests performed in 1997. This basis is questionable because all four POCs tested used filter types that are no longer used and the POCs did not contain combustible waste material, which might produce pyrolysis gases under fire conditions. As such, there is no relevant fire test data for the actual containers in their current manner of use at LANL until further tests or analyses are completed. For Area G and RANT, the ESSs note that no safety concerns exist given the state of operations and safety basis implementation. For the Plutonium Facility, the ESS proposes use of a DR of 0.1 for transuranic waste storage in the basement and the outdoor waste storage pads. For the latter, a new limit on the size and position of a refueling vehicle associated with operations adjacent to one of the waste pads will also be included. The ESS cites as the basis for using a DR of 0.1 the puncture by a forklift tine, which is the most conservative insult to the POC covered in DOE-STD-5506. The ESS proposes a DR of 1.0 for the first floor of the Plutonium Facility.

Emergency Management: This week, members of the Los Alamos County Fire Department completed their practical exercise for refresher training on glovebox firefighting (see 11/21/14 weekly). The training included approach, assessment, and mitigation of fires involving pyrophoric material such as plutonium. During the practical, small teams of firefighters talk through some actions with the trainers and demonstrate other actions such as applying manual extinguishment agent in a glovebox and using a Type D fire extinguisher through a glovebox glove. During the practical, firefighters do not use breathing apparatus in order to facilitate communications with the trainers. Additionally, the trainers are actively coordinating with Plutonium Facility management to ensure that the corrective actions associated with extinguishment agent in that facility are reflected in this training.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 11, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending September 11, 2015

DNFSB Staff Activity: C.T. Beaty was onsite to support data gathering on various emergency management and conduct of operations topics at the Plutonium Facility and Area G.

Plutonium Facility–Emergency Management: On Monday, facility personnel conducted an emergency exercise involving the response to a postulated fire in a glovebox. Notably, this was the first fire-type scenario exercised in the facility since at least 2008, as evidenced by published after action reports. The scenario was a limited fire involving ordinary combustibles without injury or contamination to personnel. In some aspects, the exercise involved improved realism such as the workers using the dropbox fire alarm and the Los Alamos Country Fire Department (LAFD) firefighters deploying a hose within the facility. Other important aspects of the response remain artificial such as LAFD assets pre-staging and arriving to the facility via a security bubble and firefighters not utilizing breathing apparatus. In particular, it is unclear when LAFD has drilled or exercised within this facility while using breathing apparatus to improve their understanding of limitations given the facility size and security protocols. Overall, exercise participants noted improvements in communications and commended the first line supervisor for recognizing the ability to isolate electrical power from the impacted glovebox.

Radioactive Liquid Waste Treatment Facility: During the past several months, low-level waste construction project personnel have experienced a number of unexpected encounters and near misses with buried utilities and piping highlighting the challenges of ongoing construction within an operating legacy facility environment. Most recently, personnel encountered four radioactive liquid waste transfer lines at a depth of about 3 ft below grade when they were expecting them to be around 13 ft. The construction crew leader's action to pause mechanical excavation upon the uncovering of a sand layer likely prevented breach of these lines. Subsequent to this incident and discussions with the Site Representatives, NNSA Field Office personnel questioned facility management on: (1) the adequacy of the piece of warped plywood protecting the exposed lines from construction hazards; (2) why personnel had expectations on the depth of the piping that were inconsistent with available drawings, (3) whether analysis existed to demonstrate the buried lines could support loads from heavy construction equipment; and (4) whether actions could be taken to better protect radioactive materials immediately adjacent to the primary thoroughfare for construction equipment contained within a large number of low-level waste containers and a piece of in-service filtration equipment.

Chemistry and Metallurgy Research (CMR) Building–Facility Evaluation: On Wednesday, an assessment team briefed the results of their Facility Evaluation of CMR. Facility Evaluations are one of LANL management's tools used to ensure continuous improvement of operations. Recently, a renewed emphasis has been placed on performing and improving Facility Evaluations across the site. The assessment team performed work observations, interviews, and document reviews to evaluate the level of performance and compliance implementation of various functional areas within CMR. The team identified a number of meaningful findings in the functional areas of Management Systems, Conduct of Engineering, Conduct of Operations, Safety Basis, and Criticality Safety.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 18, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending September 18, 2015

DNFSB Staff Activity: T.L. Hunt observed the contractor's readiness assessment of the Pit Flowsheet activities. J.E. Deplitch observed the emergency exercise described below. On Thursday, staff members A.K. Gwal, P.J. Foster, and B.K. Caleca conducted a teleconference with LANL personnel to discuss questions on the electrical systems at the Plutonium Facility.

Emergency Management: On Wednesday, personnel in the Emergency Operations Center (EOC) conducted an exercise simulating the response to an earthquake. The scenario included the collapse and subsequent fire of a wing at the Chemistry and Metallurgy Research (CMR) Building, hazardous material releases from two other facilities, and numerous impediments to local infrastructure and immediate response assets. Personnel from the DOE Office of Enterprise Assessments evaluated this exercise and briefed the NNSA Field Office on the issues they identified.

Transuranic Waste Management: Last Friday, the NNSA Field Office directed the LANL contractor to revise the *Master Plan for Enduring Waste Management*. The Field Office noted that many of the key assumptions in the 2012 version of the plan had significantly changed and that a higher level of assurance in waste management planning is needed to support transition of responsibility of Area G to EM. The Field Office also emphasized that final treatment of the remediated nitrate salt wastes warrants LANL's highest priority and provided a substantial list of elements to be addressed in the plan, which they requested by October 15, 2015.

On Tuesday and Wednesday, senior NNSA and EM Headquarters personnel toured the transuranic waste generating and management facilities and held an all-day workshop with personnel from both Field Offices and LANL as a follow on from the prior workshop (see 8/14/15 weekly). Notably, EM Headquarters personnel emphasized the need to work systematically and expeditiously through the myriad of safety basis issues present at Area G prior to considering receipt of newly generated wastes. For example, approved Evaluations of the Safety of the Situation do not exist for either the composite source term issue declared on April 29, 2015, or the new information formally provided by the NNSA Field Office regarding accidents for the remediated nitrate salts on June 25, 2015. As a result, NNSA has yet to formally accept the risks associated with these conditions.

Transuranic Waste Facility (TWF)–Safety Basis: On Thursday, the NNSA Field Office transmitted to LANL a direction letter regarding the submittal of the TWF 90% Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR). In the letter, the Field Office identified numerous major changes to the DSA and TSR that are necessary to ensure timely review and approval of future submittals. Field Office comments included classification of safety significant support systems, improper screening of certain worker hazards as standard industrial hazards, and initial conditions as design features.

Confinement Vessel Disposition Project: On Tuesday, LANL personnel transported from TA-55 to CMR the third of ten confinement vessels slated for disposition. The second vessel remains within the enclosure in CMR awaiting NNSA Field Office approval of submitted safety basis changes necessary to complete final processing.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 25, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending September 25, 2015

DNFSB Staff Activity: On Monday, D.K. Andersen, M.R. Bradisse, P.J. Foster, E.M. Gibson, R.L. Jackson, and M.T. Wright held a teleconference with Transuranic Waste Facility project personnel to discuss design codes and standards for the waste storage buildings.

Federal Oversight: One year ago, the Secretary of Energy requested a plan to transition responsibility for legacy environmental cleanup work at LANL from NNSA to the Office of Environmental Management. Recently, a number of significant milestones for that plan occurred. Last week, NNSA and EM approved a formal memorandum of understanding governing the relationship between the two field offices. Under this arrangement, the NNSA Field Office will maintain safety basis approval and startup authority until the EM Field Office can achieve appropriate staffing. However, EM will have participation and concurrence on all applicable safety basis approvals. On Monday, the permanent manager of the new EM Field Office, Douglas Hintze, reported for duty. On Wednesday, EM and the LANL contractor signed a cost-plus-award-fee contract for EM work scope to cover a bridging period until such time that EM can procure a new contractor. Notably, the bridge contract includes a milestone to complete treatment of the inappropriately remediated nitrate salt wastes by September 29, 2017.

The NNSA Field Office recently improved staffing levels with the return of the Deputy Manager, and arrival of a new Deputy Assistant Manager for Operations, two new Facility Representatives, and a Safety Basis Analyst. Additionally, permanent selections recently started in their roles as the Assistant Manager for National Security Missions and the Assistant Manager for Safeguards and Security.

Plutonium Facility–Restart Activities: This week, three Plutonium Facility resumption milestones were achieved, including:

- The contractor readiness assessment team completed their review of Pit Flowsheet operations and concluded that upon satisfactory resolution of identified pre-start findings LANL has adequately demonstrated operations can safely proceed in this area. Five preliminary findings provided at the team's outbrief were focused on areas of operations, quality assurance, and worker safety.
- The NNSA Field Office Manager approved LANL's corrective action plan for the Isotope Fuels Impact Tester (IFIT) federal readiness assessment and authorized the startup of IFIT operations.
- The NNSA Field Office Manager approved LANL's corrective action plan for the Balance of Machining (BOM) federal readiness assessment and authorized the startup of BOM operations.

Performance Management: On Wednesday, the Laboratory Director and the NNSA Field Office Manager signed LANL's Fiscal Year 2016 Strategic Performance Evaluation and Management Plan (PEMP). The PEMP is the mechanism that establishes performance evaluation criteria upon which the laboratory contractor's earned award fee is determined. The PEMP identifies performance category goals to be evaluated that include: Manage the Nuclear Weapons Mission; Reduce Nuclear Security Threats; DOE and Strategic Partnership Project Mission Objectives; Science, Technology, and Engineering; Operations and Infrastructure; and Leadership.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 2, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 2, 2015

DNFSB Staff Activity: C. T. Beaty was on site to observe the emergency exercises discussed below. On Wednesday, a staff team conducted a teleconference to discuss safety basis questions with personnel from the Transuranic Waste Facility project. On Thursday, a staff team conducted a teleconference with personnel from LANL and the NNSA and EM Field Offices to discuss the status of safety basis development activities for the storage and final treatment of the inappropriately remediated nitrate salt wastes.

Federal Oversight: On Friday, the Assistant Secretary for Environmental Management visited LANL for tours and discussions on the status of the transuranic waste management system.

Emergency Management: LANL personnel conducted annual emergency exercises at the Chemistry and Metallurgy Research (CMR) Building and the TA-48 Radiochemistry Facility. The exercise at CMR involved an acetylene tank explosion that killed a worker, injured a second worker, and damaged the facility, but did not release any radioactive materials. In accordance with their procedures, this event drove full evacuation of the facility, including the operations center and facility incident command. Evaluators preliminarily determined that all exercise objectives were met, but noted more than a dozen issues for corrective action. For example, radiological control technicians identified the need for an external supply of respirators and other response equipment. The scenario at TA-48 involved the spill of hydrochloric acid, which drove the need for a shelter-in-place action in area buildings. Participants experienced difficulties receiving the shelter-in-place notification resulting in the subsequent inability to take appropriate protective action for a release of a hazardous substance. The site representatives note that this result is concerning given the proximity of TA-48 to several hazard sources that could drive a shelter-in-place.

Area G–Safety Basis: On Monday, Area G personnel conducted a fact-finding after they determined that material-at-risk values for certain types of nitrate salt wastes may be underreported by a factor of as much as 10. Personnel determined that the historical data from the Plutonium Facility relied on safeguards values that did not accurately reflect the content of americium-241. Area G personnel are assessing the implications for the safety basis and are reviewing the extent of condition for other waste streams that may have elevated americium content.

Plutonium Facility–Seismic Safety: In a progress report issued on Wednesday, LANL management reported full completion of all milestones for the project execution strategy in fiscal year 2015, including the completion of wrapping one more girder than planned for a total of seven.

Weapons Engineering Tritium Facility (WETF)–Risk Reduction: WETF programmatic personnel recently reported on reductions of material-at-risk inventory within the facility. In particular, completion of readiness activities associated with UC-609 shipping container operations enabled facility personnel to transfer a significant quantity of tritium out of the facility (see 6/19/15 weekly). This week, a federal readiness assessment team began their review of facility operations. Successful completion of this readiness assessment is critical to additional reduction of legacy material-at-risk.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 9, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 9, 2015

Weapons Engineering Tritium Facility (WETF)–Restart Activities: On Tuesday, the federal readiness assessment team briefed the results of their assessment of tritium gas transfer operations. The team noted that all review objectives were met and identified three findings related to quality assurance and radiation protection. The team concluded that subject to satisfactory closure of all pre-start findings the facility is ready to operate safely. Additionally, the team commended WETF personnel for: (1) their exceptional rigor and formality in conduct of operations, (2) a comprehensive and well-implemented drill and exercise program, and (3) using lessons learned from Plutonium Facility readiness activities to strengthen preparation. The success with the readiness assessment is a significant milestone as gas transfer operations have not occurred since 2010 and restart of this activity is essential to reducing risk through the disposition of legacy tritium materials.

Plutonium Facility–Safety Systems: In accordance with guidance from the Secretary of Energy, the Acting NNSA Deputy Administrator for Defense Programs recently requested an Analysis of Alternatives (AoA) for planned upgrades to the Plutonium Facility. In particular, this AoA will focus on Phase III of the TA-55 Reinvestment Project (see 6/5/15 weekly) consisting of the following sub-projects: (1) fire alarm system replacement, (2) upgrading the active confinement ventilation system to safety class, and (3) separating non-seismically qualified structures from the safety class fire water supply loop. Of note, these upgrades are highlighted in LANL’s Project Execution Strategy to further reduce consequences from the Plutonium Facility resulting from seismically induced events. Results of the analysis are due no later than February 26, 2016.

Plutonium Facility–Safety Basis: Last Wednesday, Plutonium Facility management declared complete phase 2 of the implementation plan for the 2014 safety basis, revision 0.4. This step eliminated two Evaluations of the Safety of the Situation and one Temporary Modification, bringing the facility closer toward the goal of a consolidated and up-to-date safety basis. Facility management plans to complete phase 3 of the implementation plan by December 16, 2015.

Area G–Fire Protection: On Monday, operators entered their abnormal operating procedure for a discovery of an airborne, liquid, and/or solid material spill after receiving reports of water emanating from an underground firewater supply main. Fire suppression systems are not credited at Area G, but nonetheless provide an essential element of defense-in-depth. At the discretion of the shift operations manager, a fire watch was established and fire protection management notified. Fire protection subsequently informed the fire department of the impairment enabling them to consider adjusting response plans accordingly. Workers completed the repair on Wednesday

Safety Basis: Last Wednesday, LANL management transmitted to the NNSA Field Office a proposed protocol to perform atmospheric dispersion for use in safety analyses at the nuclear facilities. The protocol consolidates several improvements including updated meteorological data, recalculation of facility-specific values for deposition velocity and surface roughness, and evaluation of canyon effects. LANL requested Field Office review and concurrence prior to executing a schedule to implement the new protocol.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 16, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 16, 2015

DNFSB Staff Activity: M. W. Dunlevy was on site to perform familiarization activities, including facility walkdowns and meetings with senior Field Office and LANL management, as he assumes duties as the Board's staff cognizant engineer for LANL.

Area G–Safety Basis: On Thursday, LANL submitted to the NNSA Field Office for review and approval, a temporary modification to the Area G technical safety requirements (TSR). This temporary modification was developed to allow certain activities to proceed while the facility is in WARM STANDBY mode due to exceeding composite source term material-at-risk limits (see 5/8/15 weekly). The proposed activities are in direct support of improving the safety posture in Area G while LANL personnel resolve multiple outstanding potential inadequacies of the safety analysis conditions and other issues related to remediated nitrate salt wastes, composite source term, and uncertainties in actual material-at-risk values. Proposed activities include: (1) sampling and non-destructive assay of the unremediated nitrate salts currently stored in the Dome 231 Permacon; (2) performing real-time radiography and sampling drums containing cemented inorganic wastes; and (3) doublepacking transuranic waste containers found to exceed 80 Pu-239 equivalent curies. Of note, this temporary modification will more formally implement the relief from the TSRs provided by the Field Office in July of this year (see 7/24/15 weekly).

Plutonium Facility–Conduct of Operations: Facility personnel identified an incorrect criticality safety posting (CSP) was being used to move a waste drum through multiple fissile material operations. During a fact finding of the event, operators noted that at some point during transfer of the drum between activities the correct CSP was misplaced. Operators then completed the activity using a different CSP that was printed out, readily accessible, and had a title similar to the activity being performed without properly verifying it was the correct CSP. Issues identified during the fact finding were noted to be very similar to those that resulted in a similar event earlier this year (see 5/22/15 weekly). Facility management identified the need to develop corrective actions that will improve the process for ensuring operators verify the correct CSP is used when performing fissile material operations. Additionally, corrective actions taken in response to the previous event will be re-examined.

Plutonium Facility–Restart Activities: On Thursday, LANL submitted the Pit Flow Sheet contractor readiness assessment causal analysis and corrective action plan report to the NNSA Field Office. The Pit Flow Sheet federal readiness assessment team was on site this week to conduct a pre-visit for their assessment scheduled to commence November 9, 2015.

RANT Shipping Facility–Safety Basis: On Thursday, NNSA Field Office and LANL personnel conducted a video teleconference with the Board to provide a periodic update on the status of open issues identified with the RANT Shipping Facility safety basis communicated to the NNSA Administrator in a Board letter dated December 9, 2014. The site personnel briefed the Board on planned seismic upgrades to the facility and committed to develop a new compliant safety basis that incorporates the facility modifications and resolves the Board's concerns. The facility remains in COLD STANDBY mode until such time as the new safety basis can be approved and implemented.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 23, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 23, 2015

Plutonium Facility–Safety Basis: On Monday, the NNSA Field Office manager signed a Safety Evaluation Report (SER) approving the Plutonium Facility’s 2015 Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR). The SER also approved revisions to the currently implemented 2011 DSA and TSRs. Some of the more significant changes were made to: (1) evaluate unmanned aircraft system use, (2) update a specific administrative control for intentional confinement penetrations, (3) evaluate a new outdoor above-ground fuel tank for a diesel fire pump, and (4) update the TSRs for storage of certain plutonium-238 heat sources.

Waste Characterization Reduction and Repackaging Facility (WCRRF): The NNSA Field Office approved LANL’s submittal of the Evaluation of the Safety of the Situation (ESS) for the Potential Inadequacy of the Safety Analysis (PISA) declared for degradation of the facility roof resulting from flooding (see 7/17/15 weekly). WCRRF structural integrity is credited in the safety basis as a safety significant design feature to provide a confinement barrier. Facility personnel declared the structural integrity to be inoperable when damage to the roof was discovered. In the ESS, LANL states that the facility will remain in COLD STANDBY mode until the roof can be repaired.

Nuclear Criticality Safety: LANL management recently transmitted a number of documents to the NNSA Field Office aimed at improving the Nuclear Criticality Safety Program (NCSP) and its implementation site-wide. These documents include:

- The final report of an independent assessment of the NCSP and its implementation at the Plutonium Facility performed in accordance with DOE-STD-1158-2010, *Self-Assessment Standard for DOE Contractor Criticality Safety Programs* (see 9/4/15 weekly). Notable conclusions from the assessment included: (1) improved formalization of criticality safety program implementation, (2) improved coordination between operations and criticality safety personnel, (3) identification of some necessary improvements to procedure development, and (4) criticality resources for Plutonium Facility restart are consuming resources from other LANL facilities.
- An independent assessment of 179 previously closed NCSP corrective action items to determine the effectiveness of closure actions taken. Three closed items were determined to require additional actions and were reopened: (1) ensure application of upper subcritical limits are supported by the criticality safety evaluation’s validation report, (2) evaluate facility specific criticality directives for compliance with the site-wide directive, and (3) address emergency response deficiencies identified during an extent of condition review.
- An assessment of NCSP metrics for the third quarter of fiscal year 2015. The recently revamped Nuclear Criticality Safety Committee met this week to discuss the findings and to identify potential improvements actions.

Weapons Engineering Tritium Facility–Safety Basis: The NNSA Field Office approved LANL’s request to close the ESS and associated PISA declared when a safety significant oxygen monitoring appliance was discovered to be connected to the wrong power supply (see 7/17/15 weekly). The correct power source has been restored to the appliance and the oxygen monitoring system has since been declared operable.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 30, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: R.K. Verhaagen and J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending October 30, 2015

The Site Representatives were at DNFSB Headquarters. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 6, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 6, 2015

DNFSB Staff Activity: C. Berg attended meetings of the Tritium Focus Group and walked down the Dome 375 Permacon used to store the inappropriately remediated nitrate salt wastes.

Plutonium Facility–Nuclear Material Management: On Monday, the six sigma improvement team issued their report on streamlining selection and use of containers for the storage of nuclear materials inside gloveboxes (see 7/3/2015 weekly). Plutonium Facility management initiated this effort following a technical safety requirement violation; however, the Site Representatives note that the scope aligned well with a number of topics discussed in the Board’s Technical Report 39, *Opportunities for Risk Reduction at the Los Alamos National Laboratory Plutonium Facility through the Minimization of Material-At-Risk*. Overall, the team identified a dozen recommendations, including: (1) creating a software filter to ensure only those containers that meet facility requirements are displayed to operators on the LANMAS database interface; (2) investing in additional SAVY containers to ensure availability; (3) investigating changes to bag-out bags that would enable overpacking containers in the next larger size rather than skipping a size; (4) developing a qualification standard covering containers; (5) simplifying credited heights for various containers in the safety basis; and (6) developing a requirements document to support a potential new in-glovebox container with cost and usability benefits. Facility management is currently determining a path forward on these recommendations.

Area G–Safety Basis: Last month, NNSA Headquarters approved LANL’s request to expand the restricted airspace zone above the laboratory by roughly 20 percent. One of the benefits of this expansion is to include airspace above Area G. According to existing approved safety analysis, an aircraft crash at Area G is one of the accident scenarios at LANL with mitigated consequences that exceed the DOE Evaluation Guideline of 25 rem. LANL analysts believe that approval of this expansion will lower the chance of an aircraft crash and in combination with other measures under consideration would result in a crash scenario no longer being credible as determined by DOE-STD-3014, *Accident Analysis for Aircraft Crash into Hazardous Facilities*. NNSA is currently working a request for the expansion approval with the Federal Aviation Administration.

Plutonium Infrastructure Strategy: On Monday, LANL transmitted revision 2 of the Safety Design Strategy for the PF-4 Equipment Installation (PEI) subproject. The PEI subproject impacts 17 gloveboxes that will house analytical chemistry and materials characterization equipment. Thirteen of these gloveboxes are existing installed equipment that will be repurposed as part of the subproject. Eight of the repurposed gloveboxes do not meet the existing safety basis requirement for Performance Category 2 seismic criteria. LANL’s submittal includes safety and nuclear criticality safety analyses indicating that the benefit of upgrading these glovebox stands is minimal (~2 mrem offsite per stand) and is outweighed by the cost and schedule impacts to the project. LANL therefore concluded that the existing safety controls for each glovebox were adequate and committed to reflect this information in a page change to the safety basis prior to submittal of the Critical Decision 2/3 design packages.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 13, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 13, 2015

DNFSB Staff Activity: T. L. Hunt observed activities of the federal readiness assessment (FRA) underway for Pit Flowsheet activities at the Plutonium Facility.

Plutonium Facility–Restart Activities: On Monday, the FRA team commenced fieldwork for their assessment of Pit Flowsheet activities, which consists of 17 detailed operating procedures, supplemented by about 30 specific process instructions. These documents govern the general functional areas of welding, assembly, inspection, and evaluation. In addition to a large number of interviews, FRA team members observed six operational evolutions covering downdraft room operations, autoclave operations, assembly gas operations, weighing, dye penetrant testing, and a material move.

Plutonium Facility–Nuclear Criticality Safety: On Thursday, Plutonium Facility personnel conducted a fact-finding after operators declared a potential process deviation when a container listed on the printed inventory for a floor location was not actually present. Participants noted that the operators responded appropriately to the situation. Their subsequent review indicated that operators had moved the missing item into a new location on October 21, 2015, and that the revised printout was generated one minute after the transfer initiated. The timing of the printout is important since the LANMAS database indicates that an item being moved remains in its sending location, but is flagged with an “in transit” designation until it is received and logged into its destination. In addition to the time needed to physically move the item, operators require at least 10 minutes to complete a complicated login and LANMAS transaction process. As a corrective action, management decided to issue a lessons-learned and remind operators of their allowance to make ink-based changes in these types of situations. One of the participating group leaders also indicated that a preferable solution would be to change the software used to generate the printouts to indicate the “in-transit” status. He is separately working on a proposal to modernize the LANMAS login process, streamline the user interface specific to Plutonium Facility needs, and acquire additional terminals.

Transuranic Waste Facility (TWF): Given projections indicating that transuranic waste generation will exceed storage capacity at the Plutonium Facility sometime in early 2017, LANL management has initiated an effort to accelerate the transition to operations for the new TWF project. Their current accelerated schedule predicts final commissioning in January 2016, approval of the safety basis in February 2016, and ensuing readiness activities culminating in the start of a federal operational readiness review in September 2016. The Site Representatives note that the TWF provides about another year of storage capacity and that the majority of waste is generated through important risk reduction activities. Additional capacity will be necessary if LANL shipments to the Waste Isolation Pilot Plant do not resume in that time frame.

Area G–Safety Basis: Upon additional consideration, NNSA Headquarters has paused their effort to seek Federal Aviation Administration approval to expand the restricted airspace zone above the laboratory to include the space above Area G (see 11/6/15 weekly). If the option of expanding the restricted airspace is not pursued, LANL personnel will need to explore other measures to prevent or mitigate the consequences of this accident, such as footprint reduction, which is currently under evaluation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 20, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 20, 2015

DNFSB Staff Activity: M.W. Dunlevy conducted site familiarization activities and observed the transuranic waste workshop and Area G safety basis presentation discussed below.

Transuranic Waste Management: On Tuesday, personnel from LANL, NNSA, and EM conducted a workshop focused on management of the enduring waste stream. The workshop, which was truncated by a snow delay, included discussions on the overall waste forecast, efforts to accelerate operations at the Transuranic Waste Facility (TWF), and prioritization of anticipated permit changes. LANL analysts continue to forecast a number of pinch points between waste generation and available waste storage capacity. As reported last week, the acceleration of the transition to operations for the TWF can provide important additional capacity to the system (11/13/15 weekly). During the workshop, participants highlighted that maximum benefits from the accelerated TWF schedule are reliant on permit actions. The Site Representatives note that the alignment and coordination these workshops are stimulating is essential, particularly given the need for a functioning waste system to enable key risk reduction activities at the nuclear facilities.

Area G–Safety Basis: On Thursday, LANL management presented to NNSA and EM personnel an overview of a draft revision to the Evaluation of the Safety of the Situation (ESS) for the storage of remediated nitrate salt (RNS) wastes. LANL undertook the revision to address the NNSA Field Office direction concerning the profusion of New Information pertinent to the continued safe storage of the RNS waste (see 6/26/15 weekly). Of most significance, the New Information indicated that the value of the respirable release fraction (ARF_xRF) associated with RNS waste could be more than two orders of magnitude larger than the value used in the existing safety basis. LANL proposed a qualitative approach to factoring in an increased ARF_xRF for the purposes of analyzing potential accident consequences and evaluating the efficacy of controls to protect the public. The Site Representatives note that this approach contrasts to an EM decision to utilize a specific new value for the ARF_xRF in safety basis analysis at the Waste Isolation Pilot Plant. NNSA and EM personnel provided feedback on a number of areas including bolstering the conduct of engineering and maintenance of credited controls, improving the technical bases behind key control set points, and strengthening actions in the technical safety requirements. LANL personnel are working to incorporate this feedback prior to formal submission of the ESS.

Plutonium Facility–Restart Activities: On Wednesday, the federal readiness assessment team briefed the results of their review of Pit Flowsheet activities (see 11/20/2015 weekly). The team identified one pre-start and one post-start finding, both related to criticality safety. The team concluded that subject to satisfactory resolution of the findings the Pit Flowsheet activities are ready to safely resume. Also this week, operators successfully bisected and disassembled another pit with the robotic lathe associated with Advanced Recovery and Integrated Extraction System since receiving NNSA Field Office startup authorization on September 25, 2015. A management observation team performed oversight of this activity in accordance with the approved restart plan.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 27, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 27, 2015

Weapons Engineering Tritium Facility (WETF)–Restart Activities: Recently, LANL management submitted to the NNSA Field Office for review and approval a corrective action closure package supporting the recent federal readiness assessment (see 10/9/2015 weekly). LANL’s request addressed the two pre-start findings relating to software quality assurance and radiation protection and their proposed schedule for completing the actions necessary to close the post-start finding related to quality assurance non-conformance reporting. As the Startup Approval Authority, the NNSA Field Office Manager’s approval of this request will enable facility personnel to complete facility restart. Following resumption of authorized activities, WETF personnel plan to transfer gas out of the Tritium Gas Handling System in preparation for a maintenance outage necessary to make system upgrades to allow future gas processing for risk reduction activities. WETF personnel are also planning to conduct function testing of gas transfer systems when restarted.

Plutonium Facility–Criticality Safety: Last Friday, LANL transmitted a request to the NNSA Field Office to extend the deadline for directed safety basis changes. The NNSA Field Office direction came in a letter approving a previous request to extend the Evaluation of the Safety of the Situation/Justification for Continued Operations (ESS/JCO) concerning the potential for nuclear criticality due to firewater intrusion (see 5/15/15 weekly). LANL noted in the current request for extension that the Nuclear Criticality Safety Program Upgrades Project Plan, which is a prerequisite to making the safety basis changes, is still in revision to address necessary deficiencies. LANL committed to submit the necessary safety basis changes and the project plan by December 24, 2015. The ESS/JCO will be closed following approval and implementation of the safety basis changes.

Transuranic Liquid Waste (TLW) Treatment Facility Project: Last month, LANL management transmitted to the NNSA Field Office for approval the Preliminary Safety Design Report (PSDR). The TLW Treatment Facility will be a Hazard Category 3 nuclear facility with a proposed radiological material-at-risk limit of 55 americium-241 equivalent curies. From a risk perspective, the PSDR estimates Level C radiological consequences for the public and facility workers for a fire that vaporizes the entire facility inventory, which the PSDR deems as physically impossible but informative from a bounding standpoint. The PSDR defines Level C radiological consequences as lost work time without disability for the worker and < 5 rem Total Effective Dose for the public. The PSDR proposes 23 engineered controls with all but the safety significant chemical shields classified as defense-in-depth. The PSDR further proposes four Specific Administrative Controls that provide a limit on radiological material-at-risk limit, a limit on fissile material inventory, a fissile material transfer protocol, and a bulk chemical delivery control. For the code of record, the PSDR indicates that despite the availability of newer versions, the project’s design will adhere to DOE Order 420.1B, *Facility Safety*. LANL’s transmittal letter notes that they will provide the results of a separate review requested by the NNSA Field Office of the hazards associated with a natural gas line in proximity to the facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 4, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 4, 2015

DNFSB Staff Activity: M.R. Bradisse was on site to observe the nuclear criticality safety program (NCSP) assessment discussed below. B.K. Caleca and C.J. March were on site to perform a review of Plutonium Facility fire suppression upgrades, to walkdown systems supporting the permacon in Area G storing the inappropriately remediated nitrate salts, and to observe wildland fuel reduction activities utilizing the LANL masticator in the vicinity of Area G. All three staff members conducted a walkdown of the Transuranic Waste Facility (TWF) construction site.

Weapons Engineering Tritium Facility (WETF)–Restart Activities: On Thursday, the NNSA Field Office Manager approved LANL’s submittal of the corrective action plan and prestart finding closure package supporting the recent WETF federal readiness assessment (see 11/27/15 weekly). In the approval letter, the NNSA Field Office Manager acknowledged the prestart findings have been verified closed and authorized restart of WETF gas transfer operations.

Transuranic Waste Facility–Safety Basis: On Monday, LANL submitted to the NNSA Field Office for review and approval a revision of the TWF 90% Documented Safety Analysis (DSA) and Technical Safety Requirements. This revision was submitted to address NNSA Field Office comments and directed actions for a previous submittal (see 9/18/15 weekly). In the revision, LANL noted that all directed actions had been addressed with the exception of one relating to initial conditions assumed for building dimensions and site layout in the aircraft crash analysis. LANL indicated in the submittal that the directed action will be incorporated into the 100% DSA submittal when as-built measurements become available.

Area G–Safety Basis: LANL recently submitted for review and approval a revision to the Evaluation of the Safety of the Situation (ESS) for the storage of remediated nitrate salt wastes. This most recent submittal incorporated comments received from NNSA and EM during a presentation of a draft version of the ESS (see 11/20/2015). On Thursday, NNSA, EM, and DOE Office of Environment, Health, Safety and Security headquarters personnel conducted a video teleconference with EM and NNSA Field Office personnel to discuss the strategy for moving forward with review and approval of the ESS.

Plutonium Facility–Criticality Safety: On Thursday, a team of criticality safety experts from NNSA briefed the results of their focused assessment of the NCSP at the Plutonium Facility. This assessment was primarily conducted to address a recommendation from the federal readiness assessment team for the balance of machining operations to conduct an independent federal assessment of facility implementation of the NCSP (see 7/3/15 weekly). The assessment was conducted using criteria from DOE-STD-1158-2010 scoped to include Supervisory Responsibilities, Operating Procedures, and Materials Control. The team identified seven findings relating to material labeling, material movement processes and procedures, criticality safety infraction corrective action effectiveness, and a nuclear material exemption process that inappropriately excludes certain items from the NCSP. Of note, the finding relating to exempt items was identified as requiring resolution prior to proceeding with the next scheduled federal readiness assessment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 11, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 11, 2015

Weapons Engineering Tritium Facility (WETF)–Operations: This week, WETF personnel commenced gas transfer operations following last week’s authorization to restart. This significant milestone represents the first time these operations have occurred in nearly eight years. WETF management implemented additional measures to ensure safe operations including the requirement for an assigned manager to observe and approve performance and the need to conduct a hot wash after each evolution to ensure lessons learned are carried forward. Operators demonstrated proper, deliberate, and complete performance of procedures, with particular emphasis on confirmation of expected system responses and a willingness to stop. This week’s activities included: (1) the consolidation of gas that had been resident in tanks within the tritium gas handling system for numerous years into a low pressure receiver, (2) sampling the contents of two low pressure receivers for material control and accountability purposes, and (3) removal of the low pressure receivers from the system. Facility personnel will continue to perform gas transfer operations until all gas has been removed from the tritium gas handling system. Following removal of all gas from the tritium gas handling system, WETF will be placed into a maintenance mode to facilitate necessary system modifications and upgrades that will allow processing and removal of legacy gas and a return to function testing operations.

Plutonium Facility–Seismic Safety: LANL management recently submitted to the NNSA Field Office an updated status on actions to address a report developed by the Plutonium Facility Seismic Expert Panel (see 8/14/15 weekly). LANL identified that actions are being taken to address both required and prudent actions identified by the Seismic Expert Panel. Additionally, LANL noted that the plan to address actions directed by the NNSA Field Office was not submitted by November 5, 2015 as requested, but will rather be submitted with the annual Plutonium Facility Project Execution Strategy no later than December 24, 2015.

Emergency Management: Earlier this month, the NNSA Field Office issued their review of LANL’s self-assessment of the Emergency Management Program. Rather than conduct independent federal assessments, the Field Office partnered with LANL assessors to shadow selected program element reviews believing that this approach benefits both sides and ensures timely feedback. The Field Office noted the positive practice that LANL continues to evaluate all 15-program elements utilizing the DOE evaluation guidance. Overall, the Field Office found that nearly all of the assessments were thorough, objective, and effective in identifying deficiencies. Notably, the Field Office indicated that the review of Training and Drills was excellent and very self-critical. That review concluded, “A sustainable, comprehensive, and coordinated training and drills program has not been fully implemented as required per DOE Order 151.1C.”

Plutonium Facility–Criticality Safety: On Wednesday, LANL management requested an extension of the Evaluation of the Safety of the Situation /Justification for Continued Operations (ESS/JCO) covering unclear criticality safety evaluations for two vault rooms within the facility. The ESS/JCO, which originated in 2012 and was previously extended twice, currently expires on January 9, 2016, or when a compliant evaluation is completed and implemented, whichever occurs first. LANL requested an extension to June 30, 2016, in order to facilitate continued priority on restart activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 18, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 18, 2015

DNFSB Staff Activity: R. L. Jackson was onsite to plan oversight activities associated with Plutonium Infrastructure Strategy. Accordingly, he met with key project staff and walked down the Plutonium Facility, the Chemistry and Metallurgy Research (CMR) building, and the Radiological Laboratory Utility Office Building (RLUOB).

Plutonium Infrastructure Strategy: Late last month, the Deputy Secretary of Energy approved a restructuring of the subprojects covered under the CMR Replacement project. There are now four subprojects: (1) RLUOB Equipment Installation, Phase 2; (2) Plutonium Facility Equipment Installation, Phase 1; (3) Plutonium Facility Equipment Installation, Phase 2; and (4) Re-categorizing the RLUOB to Hazard Category 3 with a material-at-risk limit of 400 g plutonium-239 equivalent. The first two subprojects enable LANL to cease programmatic activities in the CMR by 2019, while the latter two subprojects primarily support the increased capacity required for larger pit manufacturing rates. The memo requests an updated project execution plan within 90 days and indicates approval authority will remain with the DOE Deputy Secretary for subprojects 2–4 and with the NNSA Administrator for subproject 1.

In a separate action, the DOE Deputy Secretary also approved the mission need Critical Decision (CD)-0 for the Plutonium Modular Approach project. This project addresses life extension needs for the existing Plutonium Facility in support of Department of Defense requirements and Congressional Direction. The CD-0 schedule range for project completion is December 2025 to December 2027.

Transuranic Waste Management–Restart Activities: On Thursday, LANL transmitted to the NNSA Field Office for review and approval an amendment to the quarterly site-wide startup notification report (SNR). LANL amended the SNR primarily to request a scope change to the approved readiness assessment for treatment of remediated nitrate salt waste drums. In a previous approval letter, the NNSA Field Office directed LANL to conduct a federal readiness assessment for this activity. This recent amendment proposes combining the treatment of both remediated and unremediated nitrate salt waste drums into one startup activity and to perform only a contractor readiness assessment.

Plutonium Facility–Restart Activities: On Thursday, the Associate Director for Nuclear and High Hazard Operations submitted to the NNSA Field Office a request for Startup Authorization Authority approval to commence Pit Flow Sheet (PFS) operations in the Plutonium Facility. The request also included the PFS federal readiness assessment corrective action plan for approval and the PFS federal readiness assessment pre-start closure package for adequacy verification. If approved, the PFS activity will be the fourth operation Plutonium Facility personnel have successfully resumed through the formal readiness process this calendar year. Four additional operations are scheduled to go through the formal readiness process next calendar year. Successful resumption of these activities will represent a complete restart of the Plutonium Facility operations paused by the Laboratory Director in June 2013.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 25, 2015

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: R.K. Verhaagen and J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending December 25, 2015

The Year on a Page: The Site Representatives' summary of the key happenings of 2015:

- Activities at Area G remain largely curtailed due to several unresolved inadequacies in the safety basis. Foremost of these issues, LANL personnel are working to accelerate final "render-safe" treatment of the inappropriately remediated nitrate salt wastes after EM and NNSA personnel raised questions on the adequacy of the controls for the continued safe storage of these materials.
- The Weapons Engineering Tritium Facility (WETF) performed gas transfer activities for the first time in nearly 8 years. Additionally, facility personnel completed a number of risk reduction activities and repackaged several tritium containers that were approaching their pressure limits.
- Plutonium Facility (PF-4) personnel successfully restarted four activity groupings. While these operations were of a low level of complexity, facility personnel have demonstrated an ability to prepare adequately the necessary people, procedures, and equipment. The balance of PF-4 operations, including significantly more complicated activities, will undergo restart in 2016.
- LANL's ability to process and store transuranic waste remains significantly impaired because of safety basis issues at Area G and the closure of the Waste Isolation Pilot Plant. This situation is hindering risk reduction activities at PF-4, the Chemistry and Metallurgy Research building, and WETF. To mitigate the situation, LANL management initiated transuranic waste storage on the outdoor pads at PF-4 and accelerated the schedule to commence operations at the new Transuranic Waste Facility.
- The NNSA Field Office filled several key positions, but continues to experience difficulty maintaining adequate staffing levels. The EM Field Office stood up operations and established a bridge contract for environmental cleanup activities.
- PF-4 personnel continued execution of important upgrades to the building's seismic safety posture. Notably, they placed reinforcing wraps on 7 of 27 roof girders with additional wraps in progress. They also upgraded the stands for three gloveboxes housing pyrochemical furnace equipment.
- Confinement Vessel Disposition project personnel finalized cleanout of the first sphere and completed most of the steps for a second sphere. The project's goal of completing three spheres was impeded by issues associated with the safety basis and transuranic waste storage.
- NNSA and EM raised questions on the performance of pipe overpack containers in fire scenarios at Area G resulting in complex-wide actions and experimental testing to improve the technical basis for crediting these containers in a safety basis.
- Staffing levels for the Nuclear Criticality Safety and Safety Basis divisions continue to hamper resolution of longstanding safety issues across the laboratory.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 1, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 1, 2016

The Los Alamos National Laboratory was closed this week. This report is filed for continuity purposes.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 8, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 8, 2016

Area G–Nitrate Salts: On Wednesday and Thursday, Area G management hosted a peer review team consisting of personnel from other National Laboratories to assess the state of knowledge and the path forward for the render-safe treatment of the inappropriately remediated nitrate salt (RNS) wastes. Personnel from DOE Environmental Management also observed the review, which covered the development of RNS surrogates, results of full drum surrogate testing, the proposed treatment process, environmental regulatory compliance issues, and safety basis strategy development.

Chemistry and Metallurgy Research (CMR) Building–Safety Basis: On December 21, 2015, LANL management transmitted a safety basis temporary modification to the NNSA Field Office for approval. The temporary modification supports a project to receive and store a package containing americium-241. LANL eventually intends to process the material to recover the isotope for beneficial use. The americium-241 dates back to 1979 and may include aqueous solutions and ion exchange resin; conditions that could result in the generation of hydrogen gas and other reactive species. The temporary modification proposes crediting an 85-gallon drum overpack as a new control for this activity, along with controls from the existing safety basis including the fire suppression system, combustible loading limits, material-at-risk limits for the loading dock, the emergency preparedness program, and the radiation protection program.

Plutonium Facility–Seismic Safety: On December 23, 2015, LANL submitted to the NNSA Field Office for review the fiscal year 2016 seismic project execution strategy for the Plutonium Facility. The updated strategy includes the estimated cost ranges, general scope, high level schedule, and potential funding sources for facility upgrades and maintenance activities. LANL identifies the following work scope for fiscal year 2016:

- Improve the shear capacity of the interior roof girders
- Improve anchorage of safety significant ductwork
- Complete modification of the sewer vent in the Bleed-off system to prevent the formation of ammonium nitrate on the ventilation system HEPA filters
- Seismic qualification for numerous replacement and spare components for safety systems
- Manage seismic expert panel activities and support NNSA alternative analysis as requested
- Conduct an engineering study to determine the work scope necessary to qualify the active confinement ventilation system to Performance Category 3 for seismic events

Plutonium Facility–Restart Activities: On December 22, 2015, the NNSA Field Office Manager approved LANL's corrective action plan and causal analysis for the Pit Flowsheet federal readiness assessment. The manager's approval letter noted that LANL's previously submitted objective evidence resolving a pre-start finding and manageable open item are verified closed and authorized restart of Pit Flowsheet operations. On December 29, 2015, the NNSA Field Office Manager approved LANL's Plan of Action for the contractor readiness assessment (CRA) for Muffle Furnace, Plutonium Casting, and Advanced Recovery and Integrated Extraction System operations. The CRA is currently scheduled to commence on February 1, 2016.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 15, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 15, 2016

DNFSB Staff Activity: P.J. Foster, M.R. Bradisse, and M.T. Wright walked-down the Transuranic Waste Facility project construction site and conducted a review of the revised 90 percent documented safety analysis. M.W. Dunlevy and D.J. Brown supported the site representative office. On Monday, B.K. Caleca, D.K. Andersen, and T.J. Dwyer held a teleconference with personnel from the NNSA Field Office, NNSA Headquarters, and LANL to discuss the status of various seismic safety analyses and improvements planned for the Plutonium Facility.

Chemistry and Metallurgy Research (CMR) Building–Safety Basis: On January 13, 2016, the NNSA Field Office approved without conditions the safety basis temporary modification supporting the receipt and storage of a package containing americium-241 (see 1/8/2016 weekly). Separately, CMR personnel completed their implementation verification review of safety basis changes needed to support the Confinement Vessel Disposition project and expect to commence cleanout activities of the third sphere next week.

Plutonium Facility–Seismic Safety: This week, NNSA Headquarters approved the charter for a joint working group to develop a request for proposal for conducting a dynamic, non-linear seismic evaluation of the Plutonium Facility (see 8/14/2015 weekly). NNSA elected to pursue a non-linear analysis instead of completing the second phase of NNSA's alternate seismic analysis consistent with the recommendations of the Seismic Expert Panel documented in a report dated March 31, 2015. The charter establishes a working group consisting of three NNSA personnel and two LANL engineers. According to the charter's notional timeline, the group expects to develop an initial draft of the request for proposal by June 2016 and submit a final proposal to NNSA by September 2016. The timeframe for executing structural modifications identified by the non-linear analysis will depend on durations associated with NNSA's process to procure the request for proposal, selection of modeling approaches and parameters, completion of the computationally intensive modeling, review of the results, and the design work and funding for any necessary modifications.

Weapons Engineering Tritium Facility (WETF)–Operations: On Wednesday, WETF management declared a technical safety requirement (TSR) violation when they discovered that they could not execute a limiting condition of operation (LCO) action statement. At a critique of the event, WETF personnel identified equipment failures and inappropriate operator implementation of the TSRs as the causes of the violation. In December, while conducting a surveillance on the oxygen monitoring system (OMS), operators damaged an OMS housing wire in the tritium waste treatment system (TWTS) sample loop number two. Operators placed sample loop number one in service to maintain operability of the TWTS. Subsequently, operators discovered the pressure in sample loop number one was below specifications and placed it out of service and also placed the low pressure receiver (LPR) for the TWTS in WARM STANDBY MODE as required by the TSRs. Following two weeks without an operable OMS, operators entered the LCO action statement to perform a daily nitrogen purge of the LPR as required by the TSRs. On Tuesday, operators opened a work package to replace the damaged OMS housing. The following morning, operators recognized that the lockout for the work package prevented the ability to purge the LPR, but incorrectly determined that the LCO action statement did not apply while maintenance was being performed. Following questioning by the NNSA Facility Representative, facility management agreed that the action statement should have been completed and declared the TSR violation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 29, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 29, 2016

The Site Representatives were at DNFSB Headquarters all week to support an in-depth review of the state of nuclear safety at LANL.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 12, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 12, 2016

DNFSB Staff Activity: On Tuesday, a staff team conducted a teleconference with personnel from the NNSA Field Office and LANL to discuss the safety basis supporting the receipt and storage of americium-241 materials into the Chemistry and Metallurgy Research building.

Plutonium Facility–Safety Basis: On Wednesday, Plutonium Facility management declared a Potential Inadequacy of the Safety Analysis associated with the use of cast iron and malleable iron fittings in the fire suppression system. The issue is that the seismic modeling used to qualify the system assumes pipe connections use ductile steel materials rather than cast iron, which may be installed in the facility. As a result, the basis for the system’s seismic qualification is in question. The Board’s staff identified this issue during a review in December 2015 after first raising questions about this assumption in 2012.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF)–Facility Upgrades: On Wednesday, LANL submitted to the NNSA Field Office for review and approval a revision to the WCRRF Technical Safety Requirements. The LANL submittal identified select design features that will need to be placed out of service in order to accommodate facility repairs and modifications necessary to resume waste processing activities. These repairs and upgrades include:

- Maintaining the vehicle barrier cabling system and resetting the barriers where gravel has been pushed under the barriers
- Repairing damage to the ceiling and roof structure caused by rainwater damage (see 7/17/15 weekly)
- Replacing roll-up access doors that provide a containment function and have become difficult to operate
- Making multiple repairs and upgrades to the Waste Characterization Glovebox used for waste remediation and repackaging activities

LANL’s request for revision notes that the vehicle access system gates need to be temporarily removed to allow access for trucked-in equipment and other materials necessary for the upgrades and repairs. LANL’s submittal also indicates that the facility is currently in COLD STANDBY mode and will remain so for the duration of these activities.

Weapons Engineering Tritium Facility (WETF)–Safety Basis: Last Wednesday, LANL submitted to the NNSA Field Office for review and approval a request to remove safety basis classification of the WETF Halon fire suppression system as safety significant. The currently implemented safety basis credits the Halon system with preventing an operations center fire from propagating to adjacent facility process areas. LANL’s request notes that the existing wet pipe sprinkler system in the operations center is adequate to perform this function alone. Last Friday, LANL submitted to the NNSA Field Office for review and approval an extension to the Evaluation of the Safety of the Situation (ESS) for the potential for increased probability of Oxygen Monitoring System failure (see 8/28/15 weekly). LANL’s request notes that the extension to the ESS will need to be in effect until the 2015 annual update to the safety basis has been approved and implemented.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 19, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 19, 2016

DNFSB Activity: Board Chair Connery and Board Member Hamilton, accompanied by staff members M.W. Dunlevy and J.A. Pasko visited the lab for familiarization. The visit included walk-downs of the primary defense nuclear facilities and introductions with key federal and laboratory management.

DNFSB Staff Activity: On Tuesday, staff members T.J. Dwyer and A.H. Hadjian conducted a teleconference with personnel from the NNSA and LANL to discuss the status and planned path forward for conducting a dynamic, non-linear seismic evaluation of the Plutonium Facility (see 1/15/2016 weekly) as well as ongoing facility upgrades.

Plutonium Facility–Safety Basis: Last Friday, LANL submitted to the NNSA Field Office for review and approval, a request for either closure or extension of the safety basis addendum for exceedance of seismic performance goals (see 2/1/2013 weekly). The current approved and implemented addendum is scheduled to expire on March 1, 2016. LANL notes in the request that all actions directed by NNSA in the Safety Evaluation Report approving the addendum have been completed and documented in other correspondence with the exception of planned Plutonium Facility structural upgrades. LANL submits that once these upgrades are made the Plutonium Facility will meet its required seismic performance goals. LANL's request cites a report developed by the Plutonium Facility Seismic Expert Panel (see 8/14/15 weekly) that made similar conclusions. These upgrades are currently scheduled to be completed by the end of fiscal year 2017.

Plutonium Facility–Restart Activities: Last Friday, the Contractor Readiness Assessment (CRA) team completed their review of the Muffle Furnace, Plutonium Casting, and Advanced Recovery and Integrated Extraction System operations. The CRA team identified three pre-start findings that included (1) inconsistent implementation of criticality safety requirements and steps that could not be performed as written in the procedures used, (2) failure of a criticality safety evaluation document to identify potential upset conditions, and (3) inconsistent and incomplete implementation of site requirements for procedure development. The team also identified two post-start findings relating to conduct of operations and technical safety requirement implementation. Overall the team concluded that subject to satisfactory resolution of the pre-start findings, LANL has demonstrated its readiness for equipment, procedures, and personnel to support these operations.

NNSA Field Office–Staffing Plan: On Thursday, the NNSA Field Office facility representative team supervisor submitted the fiscal year 2016 facility representative staffing plan to the Field Office Manager for review and approval. The plan identified the need for 14 full time facility representatives. This number is down from the identified need of 16 facility representatives in the fiscal year 2015 plan due to the transfer of oversight of waste management operations to the newly established EM Field Office. Currently the NNSA Field Office has six qualified facility representatives assigned in the field with two additional facility representatives in training.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 26, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 26, 2016

Chemistry and Metallurgy Research Building–Confinement Vessel Disposition (CVD)

Project: CVD project personnel recommenced cleanout operations following the implementation of necessary safety basis changes identified during previous operations and the removal of material-at-risk generated from the cleanout of the first two vessels. Ten vessels are slated for disposition. This week, CVD operators completed final assay of the second completed vessel. Additionally, operators performed the initial receipt assay and moved the third vessel into the enclosure in preparation for its cleanout. CVD personnel are on track to complete disposition of all ten vessels before the end of calendar year 2019.

Area G–Remediated Nitrate Salts: This week, the senior integrated project team hosted an Engineering Options Treatment Science Advisory Panel. The panel’s chartered function is to provide a diversity of thought with respect to the technical and operational aspects of the treatment plans for the inappropriately remediated nitrate salt wastes. In particular, this included an evaluation of potential facilities and portable capabilities to be used for the treatment process. The panel’s membership consisted of experts from Vanderbilt University, Lawrence Livermore National Laboratory, Idaho National Laboratory, Savannah River National Laboratory, Carlsbad Field Office, and several other parent contractor companies. They expect to deliver their report within 30 days.

Transuranic Waste Management: Earlier this month, LANL management transmitted an *Enduring Mission Waste Management Plan* to the NNSA Field Office, as previously requested (see 9/18/16 weekly). The plan provides LANL’s strategy to safely, compliantly, and efficiently manage all forms of wastes at the laboratory. Notable points in the plan related to transuranic (TRU) waste include the following:

- The volume of the current TRU waste inventory at Area G is equivalent to approximately 17,900 55-gallon drums. Ultimate disposition of this waste to the Waste Isolation Pilot Plant (WIPP) will require 270 and 730 shipments for the aboveground and the belowground inventories, respectively.
- LANL forecasts the generation of approximately 6,950 drum equivalents of new waste during fiscal years 2015 through 2021, resulting in 315 shipments to WIPP. For this newly generated waste, the Materials Recycle and Recovery program generates the most waste by volume and the plutonium-238 program generates the most by radioactivity. Both of these programs largely support risk reduction activities within the Plutonium Facility.
- The resumption date for shipments from LANL to WIPP is unknown, as well as the number of shipments that LANL will be allocated. Further, the schedules for completion of seismic upgrades and safety basis revisions for the RANT Shipping Facility are currently unknown.
- Other key unknowns for planning purposes include the future rates for drum remediation and certification activities and the date on which retrieval and processing of belowground waste will commence.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 4, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 4, 2016

DNFSB Staff Activity: On Thursday, staff members C. Berg, D.J. Brown, R.T. Davis, M.W. Dunlevy, R.C. Eul, N.M. George, and J.A. Pasko conducted a teleconference with personnel from each of the Los Alamos Field Offices and LANL. The discussion covered the path forward and associated technical bases for planned near-term actions associated with LANL's strategy to improve the safety posture of the inappropriately remediated nitrate salt (RNS) wastes through enhancing vent capacity and other measures (see 2/5/16 weekly).

Area G–Emergency Management: On Thursday, Area G personnel conducted their second drill as part of their nascent program for emergency and operational drills. The tabletop style drill included a crew of waste operators and radiological control technicians that will be involved with the near-term installation of additional vent capacity for the RNS wastes. The scenarios covered responses to a radiological continuous air monitor alarm, as well as a medical emergency. The drill coordinators are using experience from successful efforts at the Plutonium Facility to develop the program at Area G. They have established two standing drill times each week and plan to increase the complexity and reduce the artificiality associated with upcoming drills. For example, next week's drills will require the use of full personal protective equipment, including powered air purifying respirators.

Emergency Management: LANL training personnel are in the process of completing evolutions of the practical component for Emergency Radiological Responder Training that covers firefighters from the Los Alamos County Fire Department. The practical consists of three modules: (1) contaminated patient handling, (2) doffing protective equipment simulated to be potentially contaminated, and (3) use of one type of radiation monitoring equipment. The training is thorough and conducted in a stop-action style intended for immediate feedback for both participating and observing firefighters. Use of simulation includes an approximately 60 pound mannequin and intentional lack of respiratory protection for the patient handling module to facilitate verbalization of actions. The Site Representatives note that LANL and NNSA Field Office personnel frequently point to this practical evaluation as the basis for simulating performance of these response steps during evaluated exercises.

Plutonium Facility–Safety Basis: On Tuesday, the NNSA Field Office Manager approved LANL's request for closure of the safety basis addendum for exceedance of seismic performance goals (see 2/19/16 weekly). The approval letter suggests that the Plutonium Facility meets established seismic performance goals and cites this as the basis for closure approval. The letter also notes that ongoing roof girder upgrades will further improve facility seismic performance.

Plutonium Facility–Nuclear Criticality Safety: Last Friday, LANL transmitted to the NNSA Field Office a Nuclear Criticality Safety Program Improvement Plan. This plan was submitted as required by the NNSA Field Office in an approval letter extending the Evaluation of the Safety of the Situation/Justification for Continued Operations regarding the potential for criticality due to firewater flooding (see 6/6/2014 weekly). The plan identifies intended actions to rebuild a robust Nuclear Criticality Safety Program that enables continued safe and efficient operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 11, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 11, 2016

DNFSB Activity: On Monday and Tuesday, Board Member Sullivan visited LANL for walk-downs of the Weapons Engineering Tritium Facility, Plutonium Facility, Chemistry and Metallurgy Research building, and Area G. He also attempted to observe an emergency drill at Area G; however, Emergency Management personnel cancelled the drill after Fire Protection Division personnel needed to support the planned scenario did not arrive because they had not been scheduled to participate.

Area G–Emergency Management: On Wednesday, Area G personnel conducted their first learning team event. Area G management called for the learning event after a slower than desired response to a transuranic waste drum of questionable integrity (i.e., potential breached drum) that occurred last week. Participants in the learning team discussed several items of interest. For example, an abnormal operating procedure guides the operations center response to this condition; however, written guidance for other key responders, such as industrial hygiene and radiological control technicians (RCT), is limited and largely reliant on training and on-the-job experience. A large number of the RCTs are new to Area G, exacerbating this problem. The Site Representatives also note that specific RCT practices vary extensively across the laboratory. For example, participants discussed that after the RCT detected radioactive contamination on the operator who had first observed the questionable drum, both individuals walked to another dome to utilize a different contamination monitor without attempting to fix or otherwise isolate the suspect contamination. While the contamination ultimately was determined to be radon, practices at other LANL facilities would necessitate some type of additional control prior to moving an individual with suspect contamination. Notably, Area G personnel identified two additional drums of questionable integrity this week. Response to these events was improved, in part resulting from actions taken to ensure industrial hygiene equipment is now checked daily for adequate electrical charge and given the necessary single point calibration check.

Area G–Safety Basis: Last week, LANL submitted to the NNSA Field Office a request for extension of the Evaluation of the Safety of the Situation (ESS) for the Potential Inadequacy of the Safety Analysis (PISA) declared for a single drum fuel pool fire (see 3/13/15 weekly). On Wednesday, the NNSA Field Office approved a LANL request for extension of revision 3 of the ESS for the transuranic waste drums containing inappropriately remediated nitrate salts (RNS) PISA (see 3/27/15 weekly). Both of these ESSs also serve as Justification for Continued Operations and were set to exceed their twelve-month approval deadline.

On Monday, LANL submitted to the NNSA Field Office for review and approval revision 5 of the ESS for the transuranic waste drums containing RNS. While LANL previously submitted revision 4, the NNSA Field Office neither approved nor rejected it. Revision 5 allows for installation of increased venting capacity and pressure relief directly on the drums. The ESS will be implemented in two phases. The first phase will allow lid removal from the standard waste boxes currently housing the RNS drums. The second phase will allow installation of the additional venting and pressure relief devices. LANL is proposing this action because test data has demonstrated that preventing the RNS drums from over-pressurization significantly reduces the chance for a self-initiated thermal runaway reaction.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 18, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 18, 2016

Area G–Safety Basis: On Thursday, the NNSA Field Office recommended to the NNSA Cognizant Secretarial Officer partial approval of revision 5 of the Evaluation of the Safety of the Situation (ESS) for the inappropriately remediated nitrate salt (RNS) wastes. The approval for this revision is phased with this action authorizing LANL personnel to remove the lids from the standard waste boxes. The second phase will authorize installation of an additional vent and pressure relief device. In accordance with revision 5, controls for lid removal include: gas sampling; visual inspections; container temperature monitoring; prohibition on container movement; and Permacon temperature control. The installation step includes additional controls for non-sparking and non-conductive tooling. The post-installation control set includes: the new venting and pressure relief manifold; the Permacon fire suppression, ventilation, and cooling systems; response to continuous air monitors; visual inspection; prohibition on container movement; container spacing; and implementation of Conduct of Maintenance and Engineering. The ESS notes that revision 6 will include controls for wildland fire induced accidents and will be submitted within 30 days of approval of revision 5. Notably, this recommendation by the NNSA Field Office represents the first federal approval of a safety basis covering the RNS wastes following the new information that emerged in the March 2015 Accident Investigation Report indicating a substantially higher potential release hazard associated with these wastes.

Area G–Emergency Management: This week, Area G personnel conducted two discussion-based (Type I) drills. On Thursday, Area G management approved standing orders for operations center responses to continuous air monitor alarms and personnel contamination events. Management directed the development of the standing orders in response to an observation from a January drill indicating that written instructions did not exist for all conditions that require a response by operations center staff. In parallel, management has directed a review of all abnormal, alarm, and emergency procedures, including procedures that were retired.

Plutonium Facility–Criticality Safety: On Monday, LANL submitted to the NNSA Field Office a corrective action plan for the assessment of implementation of the Plutonium Facility criticality safety program (see 12/4/15 weekly). An independent federal team performed this assessment in two phases primarily in response to a recommendation by the Balance of Machining federal readiness assessment team following their review (see 7/3/15 weekly). The team recommended this assessment be completed prior to commencing the Actinide Recovery and Integrated Extraction System (ARIES), Furnace, and Casting contractor readiness assessment completed in February of this year. LANL identified five findings from the assessment that need to be addressed prior to commencing the ARIES, Furnace, and Casting federal readiness assessment scheduled for April of this year. LANL is tracking these findings in its Performance Feedback and Improvement Tracking System and the Plutonium Facility Nuclear Criticality Safety Board is managing closure of these corrective actions to support the upcoming federal readiness assessment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 25, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 25, 2016

DNFSB Activity: On Tuesday, the Board conducted a public hearing regarding the hazards posed to the public and workers by the management of transuranic waste at Area G. On Wednesday, Board Member Santos, accompanied by staff members M.W. Dunlevy and N.F. Khalil, walked-down the Plutonium Facility and the Dome 375 Permacon at Area G.

Area G–Safety Basis: On Tuesday, the NNSA and EM Field Offices transmitted approval to LANL management of phase 1 of revision 5 for the Evaluation of the Safety of the Situation (ESS) concerning the inappropriately remediated nitrate salts (RNS) wastes (see 3/18/16 weekly). The approval included four actions directed by NNSA Headquarters: (1) submission within 1 week of a resource-loaded schedule for installation of the pressure relief devices; (2) completion of a progress briefing by April 15th on wildland fire mitigation activities; (3) commencing April 18th, the NNSA Field Office is to conduct weekly briefings on the status of phase 2 activities until they are completed; and (4) concurrent with submission of revision 6 of the ESS, the NNSA Field Office is to submit a strategy for resolving all of the outstanding Potential Inadequacies of the Safety Analysis for Area G. On Friday, LANL personnel completed their Implementation Verification Review of the phase 1 controls and plan to commence a Management Assessment next week to confirm readiness to remove the lids from the standard waste boxes containing the RNS wastes.

Area G–Emergency Management: In the past two weeks, Area G and LANL wildland fire management personnel have taken dramatic actions to improve the protection of the Dome 375 Permacon from potential wildland fire insults. These actions include: (1) significantly expanding the zone of reduced shrubbery on the south side of the Permacon; (2) improving an existing fire break; (3) developing a new fire break; and (4) developing a new fire response plan that utilizes the fire breaks and an area for retardant application to minimize the potential for the postulated worst case fire impact to the Permacon. Area G personnel are also in the process of procuring specialized reflective fire blankets for additional protection of the RNS wastes. These actions come as conditions in northern New Mexico become increasingly favorable for wildland fire. In fact, on Tuesday a wind-driven brush fire burned about 30 acres near Pojoaque, a town approximately 15 miles northeast of Area G.

On Monday, LANL Emergency Management personnel issued an addendum to the Emergency Planning Hazards Analysis for the RNS wastes. The addendum incorporates specific information on the hazard posed by the RNS waste including use of the respirable release fraction identified for the RNS wastes by the DOE-EM Carlsbad Field Office (see 11/20/15 weekly). Issuance of this addendum addresses a significant issue identified in the Board’s letter dated January 7, 2016.

Area G–Engineering: Earlier this month, Area G personnel completed commissioning of the new supplemental chiller for the Dome 375 Permacon (see 7/10/15 weekly). They expect to issue operating procedures in April 2016.

Plutonium Infrastructure Strategy: On Thursday, LANL personnel completed placement of a second foundation for the new uninterruptible power supply (UPS) building. A difficult cold joint encountered during placement of the original foundation required complete rework. The new UPS building will be a seismic performance category 3 structure that could be used in support of the incremental upgrades necessary for an eventual performance category 3 active confinement system for the Plutonium Facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 1, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 1, 2016

DNFSB Staff Activity: C.T. Beaty observed the annual emergency exercise at the Plutonium Facility, observed an emergency drill at Area G, and conducted discussions with operators and emergency management personnel. She conducted these activities in preparation for an upcoming review of emergency preparedness and response.

Area G–Operations: On Monday, Area G personnel completed their corrective actions for a finding identified during the previous week’s Implementation Verification Review of the phase 1 controls for revision 5 of the Evaluation of the Safety of the Situation (ESS) concerning the inappropriately remediated nitrate salt (RNS) wastes (see 3/25/16 weekly). The finding concerned the level of knowledge of the operations center personnel regarding the procedures and processes in place that implemented the ESS. On Wednesday, following completion of the corrective actions, Area G management commenced a Management Assessment of the readiness of Area G personnel to perform phase 1 operations. In this phase, operators will remove the lids from the standard waste boxes housing the RNS waste. A Management Assessment is a tool for LANL managers to systematically observe work and evaluate performance of management systems, but is not directly tied to the LANL readiness program. The Management Assessment included interviews with key personnel, a demonstration of the operational evolution, and a discussion-type emergency drill.

Area G–RNS Wastes: On Tuesday, LANL management issued a resource-loaded schedule for completing phase 2 of ESS revision 5, pertaining to the installation of pressure relief devices and higher capacity venting for the RNS wastes contained in 48 waste drums. The schedule indicates completion of this effort by May 13, 2016. This schedule assumes that they receive NNSA and EM approval of phase 2 by April 11, 2016. In addition to the pressure relief devices, phase 2 will result in several additional controls including a formal Specific Administrative Control for response to a continuous air monitor and implementation of elements of Conduct of Engineering and Maintenance for the ventilation and fire suppression systems. LANL management intends to submit the plan for the balance of the RNS waste contained in 12 pipe overpack containers as part of ESS revision 6, which is due by April 22, 2016.

On Wednesday, most of Area G, including the Dome 375 Permacon that houses the RNS wastes, experienced a planned electrical power outage lasting about 5 hours. The outage occurred to replace a power pole that experienced wind damage on Tuesday. Notably, provisions do not currently exist for backup electrical power to many of the systems contributing to safety at the Permacon, such as the ventilation system, the air coolers, and the supplemental chiller. Area G management continues to explore options to address this situation.

Plutonium Facility–Emergency Management: On Wednesday, Plutonium Facility personnel conducted their annual Emergency Planning Hazards Analysis exercise. This year’s scenario involved a postulated release of chlorine gas on the exterior of the facility, which injured two workers and drove shelter-in-place actions for a large area. At the critique, evaluators preliminarily identified about 18 significant issues, many largely associated with shelter-in-place related difficulties.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 8, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 8, 2016

DNFSB Staff Activity: M. R. Bradisse and D. L. Burnfield observed the federal readiness assessment for the Furnace, Casting, and Advanced Recovery and Integrated Extraction System activities in the Plutonium Facility. The Site Representatives attended briefings at DNFSB Headquarters. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 15, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 15, 2016

DNFSB Staff Activity: C.T. Beaty, J.E. Deplitch, A.M. Hutain, and C.J. March were on site to conduct a review of the LANL emergency management program. Their review included discussions with LANL, NNSA Field Office, and Los Alamos County Fire Department personnel, observation of an exercise at the Emergency Operations Center, and walk-downs of the Plutonium Facility, Area G, and the Weapons Engineering Tritium Facility. T.L. Hunt conducted a supplemental review of the operational drill programs and abnormal response procedures at the same three facilities.

Area G—Inappropriately Remediated Nitrate Salts (RNS): Last week, following successful completion of a Management Assessment (see 4/1/2016 weekly), Area G operations personnel commenced activities to remove the lids from the standard waste boxes containing the RNS waste. Operators are performing this activity as part of the implementation of phase 1 of revision 5 of the Evaluation of the Safety of the Situation (ESS) for safe storage of the RNS waste (see 3/25/2016 weekly). To date, operators have removed 12 of the 46 lids planned for this phase. Removal actions have proceeded well—no contamination or degraded conditions have been encountered and unexpectedly no bolts have required drilling for removal. Area G personnel continue to prepare for the phase 2 pressure relief device installation effort and hope to commence the associated Management Self-Assessment late next week.

Plutonium Facility—Safety Basis: Last Thursday, the NNSA Field Office approved revision 1.1 of the facility's 2015 safety basis. The revision adds scope for a new activity, clarifies the ability to create confinement penetrations within the facility, closes two previous conditions of approval, and incorporates three outstanding ESSs associated with criticality safety, nonconforming heat-source plutonium clads, and the condition of the stand for the Isotope Fuels Impact Tester. Additionally, the revision deleted or modified previously identified vulnerabilities for some existing safety systems including the ventilation system, uninterruptable power supply, and the diesel fire pumps.

Plutonium Facility—Restart Activities: On Tuesday, the Federal Readiness Assessment (FRA) team delivered the final report of their assessment of Plutonium Facility readiness to restart Furnace, Casting, and Advanced Recovery and Integrated Extraction System (ARIES) operations. The FRA team identified two pre-start findings relating to criticality safety controls that included: 1) some operations did not have documentation demonstrating certain dimensional requirements identified in a criticality safety evaluation were being met, and 2) an approved item list in one procedure contained items that did not meet current criticality safety requirements. The FRA team also identified two post-start findings relating to emergency/operational drill programs and criticality safety. Of note, the assessment report stated that in general, the FRA team was impressed with the actions taken by Plutonium Facility management, staff, and operators to demonstrate readiness. The team recommended that upon correction of the two pre-start findings and development of a corrective action plan for the post-start findings Plutonium Facility personnel be authorized to restart these operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 22, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 22, 2016

Area G–Inappropriately Remediated Nitrate Salts (RNS): This week, Area G operators continued removal of the lids from the standard waste boxes containing the RNS waste as part of implementing phase 1 of revision 5 of the Evaluation of the Safety of the Situation (ESS). To-date, they have removed 35 of the 46 lids planned for this phase. Removal actions continue to proceed well—no contamination or degraded conditions have been encountered and relatively few bolts (10 of 1470) have required drilling.

Area G personnel continue to prepare for the phase 2 pressure relief device installation effort. This week's preparations included procedure refinement, which they conducted in accordance with the best practice of involving the work crews, persons in charge, industrial hygiene, radiation safety, and the Deputy Associate Director. Based on the progress toward approval of the phase 2 safety basis, they estimate starting the associated Management Self-Assessment next week.

Area G–Safety Basis: Several key safety basis transactions occurred on Thursday.

- The NNSA Field Office approved phase 2 of revision 5 of the ESS for the RNS waste and forwarded it on to the NNSA Cognizant Secretarial Officer for approval, given the potential for mitigated consequences to exceed the DOE Evaluation Guideline. Noting the need for additional review, the Field Office did not act on the revised aircraft crash analysis for the RNS included in this ESS.
- LANL management transmitted to the NNSA Field Office for approval revision 6 of the ESS for the RNS. Revision 6 provides the results of a postulated worst-case wildland fire model coupled to a heat transfer model in order to determine peak temperature insults to the RNS waste. The peak temperature was determined to be 32 °C, which is below the 40 °C threshold of concern established from LANL's research. Notwithstanding this result, LANL proposed a formal wildland fire management control, including the use of fire retardant, fuel mitigation, and fire blankets. Revision 6 also proposes moving forward with the installation of the pressure relief devices for the RNS waste contained within the pipe overpack containers.
- LANL management transmitted the project execution plan for the safety basis changes necessary for the final treatment of the RNS waste. The plan outlines 14 new work activities to be included among the safety basis documents for Area G, onsite transportation, and the Waste Characterization, Reduction, and Repackaging facility. The planned submittal of the first two documents is June 16, 2016, and the latter document is July, 20, 2016.
- LANL management committed to submit by May 13, 2016, a new ESS to cover all of the other open Potential Inadequacies of the Safety Analysis (PISA) at Area G with the exception of the pipe overpack, which is contingent on ongoing testing at Sandia National Laboratories.

Plutonium Facility–Safety Basis: Last Friday, LANL management submitted to the NNSA Field Office for review and approval an ESS to address the PISA associated with the use of cast iron and malleable iron fittings in the fire suppression system (see 2/12/16 weekly). The ESS indicates the fire suppression system may not meet its required performance category 2 seismic criteria and additional testing is required. LANL has implemented additional material-at-risk limits as a compensatory measure until the results of the analysis are complete.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 29, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 29, 2016

Area G—Inappropriately Remediated Nitrate Salts (RNS): This week, Area G operators completed removal of the lids from the standard waste boxes containing the RNS waste as part of implementing phase 1 of revision 5 of the Evaluation of the Safety of the Situation (ESS). Of the 46 boxes covered in phase 1, 39 have had their lids removed. The seven remaining boxes will undergo an integrated process for lid removal and pressure relief device installation as part of phase 2.

On Tuesday, LANL management received approval from NNSA and DOE-EM on phase 2 of revision 5 of the ESS. As part of the approval, the NNSA Cognizant Secretarial Officer noted that the installation of the pressure relief devices will significantly reduce the likelihood of a self-initiated thermal runaway; however, he concluded that the risks associated with the RNS wastes will not be completely eliminated due to the absence of additional conclusive statements from LANL. As a result, he emphasized the importance of all the planned controls and compensatory measures. Additionally, he noted the March loss of electrical power event (see 4/1/16 weekly) and requested weekly status reports on LANL's ongoing effort to ensure the availability of backup power. Given Tuesday's approval, Area G personnel will commence their Management Self-Assessment for phase 2 on Monday. Full implementation of the balance of the controls will follow completion of phase 2.

Safety Basis: On Wednesday, LANL management declared a Potential Inadequacy of the Safety Analysis (PISA) at Area G and the Plutonium Facility regarding certain sealed sources used for a piece of transuranic waste assay equipment known as the High Efficiency Neutron Counter (HENC). These sources, which the Carlsbad Field Office has specified for use throughout the complex, consist of highly dispersible contents—actinide oxides mixed in a diatomaceous earth matrix—welded into steel containers that are fire rated to survive a 400 °C insult. Preliminary results of fire modeling for one of the HENC units currently at Area G and planned for use at the new Transuranic Waste Facility indicates that fire temperatures could exceed 1000 °C due to significant quantities of plywood and plastic used in its construction. LANL analysts' initial review concluded that at this temperature the sources could be expected to undergo a pressurized release as opposed to the ordinary thermal insult currently reflected in the safety analysis. This change results in an increase in the amount of radioactive material released by a factor of nearly 1200. Management at both facilities conducted fact-findings and initiated operational restrictions that mainly involve storing the sources in fire-rated safes, ensuring operations with the sources are continuously attended, and excluding nearby use of fuels. Concerns with the respirable release fraction associated with these sources first originated in a Board letter dated June 11, 2012.

Plutonium Facility—Nuclear Materials Management: Plutonium Facility personnel recently conducted a bimonthly inventory as part of their nuclear materials control and accountability (MC&A) program. During these inventories, personnel perform a visual inspection on nearly all of the containers of nuclear material in the facility outside of the vault. The inventory is performed twice—first by the operations group as a pre-inventory check and then a second time by MC&A personnel. The Site Representatives note that these inventories represent an ideal opportunity for personnel to identify and record the container type for each item. Currently a large fraction of the container types are unspecified in the nuclear material management database, as noted in DNFSB Tech-39.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 6, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 6, 2016

Area G–Inappropriately Remediated Nitrate Salts (RNS): This week, Area G personnel conducted their Management Self-Assessment (MSA) for pressure relief device installation as part of implementation of phase 2 of revision 5 of the Evaluation of the Safety of the Situation (ESS). The MSA team observed work evolutions covering assembly of the pressure relief device and its installation on a simulated RNS waste drum, reviewed documents, and conducted interviews. The team also observed an evaluated emergency drill (Type III) that involved work crew and operations center response to the discovery of a pressurized bag in a simulated RNS drum during pressure relief device installation. The team expects to brief their results on Monday and installation activities should commence soon thereafter following closure of any pre-start issues. While this represents important progress on improving the safe storage of the RNS waste, much remains to be done to complete implementation of revision 5 of the ESS. Additionally, the NNSA Field Office has yet to review and approve revision 6 of the ESS (which covers the wildland fire threat), and the EM Field Office has yet to produce a project plan for the RNS final treatment effort.

Area G–Operations: On Wednesday, Area G personnel responded to two abnormal events that occurred during the planned window for the evaluated drill. The events were the discovery of two drums labeled as radioactive and missing their bungs and a third drum labeled as empty that spilled unknown solid materials. In both cases, responders found no industrial hygiene or radiological issues. The operations center staff responded well and was likely aided by their pre-drill posture. As such, the operations center was manned above typical levels and had informed the workforce to suspend normal calls and in-person queries. Area G management expects to conduct a fact-finding next week on these events.

Plutonium Facility–Restart Activity: Plutonium Facility personnel commenced their MSA for pyrochemistry operations, which includes metal chlorination, multiple-cycle/direct oxide reduction, metal coalescence, chloride melt preparation, salt distillation, and molten salt extraction. The current schedule anticipates the commencement of the contractor readiness assessment in July, which is currently paced by completion of revised criticality safety evaluations expected in June. LANL management recently briefed NNSA Headquarters on a proposal to remove the aqueous processing activities from the formal restart project. If this change is approved, the project hopes to be complete by the end of the fiscal year. Following completion, management has indicated the intent to reprioritize criticality safety and conduct of operations resources across the balance of the facility that did not undergo formal readiness.

The NNSA Field Office chartered a Line Management Review Team to shadow this pyrochemistry MSA and follow-on Contractor Readiness Assessment. The team is comprised of NNSA headquarters and Field Office personnel and is tasked with evaluating the robustness of LANL's readiness process. The team has been directed to develop a summary report documenting their conclusions and to make a recommendation to the Startup Authorization Authority on LANL's readiness to proceed with the Federal Readiness Assessment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 13, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 13, 2016

DNFSB Staff Activity: R.V. Kazban and R.L Jackson observed a multi-day external independent review on phase 2 of the equipment installation project for the Radiological Laboratory Utility Office Building. They also walked down portions of the Chemistry and Metallurgy Research Building and the Plutonium Facility. On Thursday, B. K. Caleca, T.J. Dwyer, and A.H. Hadjian observed a meeting of the Seismic Expert Panel to discuss the path forward for additional analysis and testing in support of the Plutonium Facility.

Area G–Inappropriately Remediated Nitrate Salts (RNS): This week, the Management Self-Assessment (MSA) team briefed the results of their review on the readiness to conduct phase 2 of revision 5 of the Evaluation of the Safety of the Situation for the RNS waste. The team identified six pre-start and six post-start issues. The pre-start issues involved conduct of engineering concerns regarding the design and testing for the pressure relief devices, disposal of oily rags, procedure issues, and several concerns with radiological protection and industrial hygiene practices. Notable post-start issues included inaccurate and incomplete information in emergency response documents (run sheets and pre-incident plans) and conduct of maintenance concerns regarding the fire suppression system. Area G management is actively working closure of corrective actions and expects to commence pressure relief device assembly and installation activities next week.

Safety Basis: LANL safety basis analysts determined that the Potential Inadequacy of the Safety Analyses declared at Area G and the Plutonium Facility regarding the potential for pressurized releases from certain sealed sources represented a positive unreviewed safety question (see 4/29/16 weekly).

Weapons Engineering Tritium Facility (WETF)–Safety Basis: On Tuesday, the NNSA Field Office manager signed the Safety Evaluation Report (SER) approving LANL’s submittal of the 2015 Documented Safety Analysis and Technical Safety Requirements for WETF. Once implemented, this safety basis will supersede the existing safety basis, which consists of a 2012 SER and a 2013 SER addendum. Of significance, this safety basis reduces the material-at-risk (MAR) allowed in the facility to 60 percent of the current limit. As a result of this MAR reduction, the consequences of the worst case postulated accident scenario are reduced below the DOE evaluation guideline from 26 rem to 16 rem total effective dose. The SER notes that the reduction in MAR was taken in response to vulnerabilities identified with numerous safety significant systems and their inability to survive a Performance Category 2 seismic event as required. Although this updated safety basis is a needed improvement to the WETF operating posture, the SER notes that the safety basis is still baselined to a 2002 submittal and legacy issues still exist that will require a complete rewrite of the safety basis to resolve.

Confinement Vessel Disposition (CVD) Project: This week, CVD project personnel removed the third processed vessel from the enclosure. In the coming weeks, project personnel will relocate the three processed vessels from the Wing 9 high bay to the yard in order to support receipt of a fourth vessel for processing.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 20, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 20, 2016

DNFSB Staff Activity: M.W. Dunlevy and R.C. Eul met with LANL Quality Performance Assurance Group personnel to discuss the current status of LANL's Contractor Assurance System (CAS) as well as improvement initiatives underway to revitalize the CAS program.

Area G–Inappropriately Remediated Nitrate Salts: This week, following closure of corrective actions for the Management Self-Assessment pre-start findings, Area G personnel commenced pressure relief device assembly and installation (see 5/13/16 weekly). As of Thursday, operators had installed seven pressure relief devices and expect to install six to eight devices per day going forward. If operators maintain this pace, all pressure relief devices required by phase 2 of revision 5 of the Evaluation of the Safety of the Situation (ESS) could be installed by the end of next week.

Workers paused operations while preparing to install the first pressure relief device when thermocouples monitoring drum temperature erroneously indicated a rising temperature in both the drum being prepared and a nearby drum. Operators exited the Dome 375 Permacon upon receiving the indication of the rising drum temperatures. At a fact finding of the event, Area G managers determined the most likely cause of the erroneous readings was the operators moving one thermocouple wireless transmitter and laying a procedure on the other in preparation for pressure relief installation. Area G operators do not credit the thermocouples with providing reliable temperature indications; an infrared thermometer is used locally to determine drum temperature prior to performing work. Area G engineering personnel are currently working to commission the thermocouple system. For corrective actions, the Facility Operations Director developed a written direction to operations center personnel on how to manage the thermocouple readings during future operations and directed operators not to use adjacent drums/standard waste boxes as work stands.

Area G–Safety Basis: Last Friday, LANL submitted to the NNSA Field Office for review and approval, an ESS for three Potential Inadequacies of the Safety Analysis (PISA) for transuranic waste inventory discrepancies in Area G. These PISAs affect material-at-risk (MAR) quantity and form assumptions used in the safety basis, and have remained unresolved for many months. The ESS identifies a number of more stringent MAR limits as compensatory measures to ensure Area G remains in a safe condition. NNSA Field Office approval of the ESS will allow Area G to return to OPERATIONS MODE, and as such will serve as a Justification for Continued Operations as well.

Plutonium Facility–Restart Activities: On Wednesday, the NNSA Field Office manager approved LANL's corrective action plan for the Muffle Furnace, Casting, and Advanced Recovery and Integrated Extraction System (FCA) Federal Readiness Assessment (FRA). Additionally, the NNSA Field Office manager verified the FRA pre-start findings were closed and authorized Plutonium Facility personnel to restart FCA operations. Also on Wednesday, LANL transmitted to the NNSA Field Office for review and approval, a Plan of Action for the Contractor Readiness Assessment for Plutonium Pyrochemical Operations. Of note, the Plutonium Pyrochemical Operations are the final planned activities of the Plutonium Facility resumption project following the LANL Director's decision to pause Plutonium Facility operations in June 2013.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 27, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 27, 2016

DNFSB Staff Activity: P. J. Foster observed the independent construction project review for the new Transuranic Waste Facility (TWF) project.

Area G–Inappropriately Remediated Nitrate Salts (RNS): There were several notable accomplishments:

- On Thursday, Area G operators completed installation of the pressure relief devices on all of the 55-gallon drums containing RNS wastes. Installation of high capacity filter vents should proceed next week.
- LANL has staged sufficient fire blankets to protect all of the RNS waste in the event of an encroaching wildland fire.
- Last week, the senior integrated project team leads issued the overall project execution plan for the *Nitrate Salt Safing and Treatment Project*. This represents a key document in the path toward eliminating the hazard associated with the RNS waste.

TWF Project: On Tuesday, the LANL contracting officer requested NNSA Field Office approval to proceed with an alternate approach to completing the safety basis for the project utilizing DOE-STD-3009 instead of proceeding with the controls identified in the preliminary safety basis developed using DOE-STD-1189. In particular, LANL management believes controls associated with the passive physical characteristics of the site, the fire suppression system and its supporting systems, and controls associated with standard industrial hazards exceed the requirements of the contract. While these systems have already been designed and installed per their current safety classifications, LANL provided a rough order of magnitude estimate of the lifecycle savings associated with their alternate approach of about \$50M to \$120M. During this week's construction project review, LANL managers also emphasized that existing project schedule commitments were in jeopardy should their alternative approach be denied. LANL requested a response by June 3, 2016. The Site Representatives note that this relatively simple storage facility is consuming significant NNSA and LANL senior management attention.

Plutonium Facility–Work Control: On Tuesday, an empty safe estimated to weigh several thousand pounds tipped into a glovebox while being moved for seismic anchoring. No injuries occurred and no release of contamination was detected despite the fact that the safe impacted the glovebox on a glove port. During the fact finding, workers indicated that they utilized two transport skates instead of the four specified in the work package. Management is developing a recovery plan to upright the safe, inspect the glovebox line for damage, and assess the lift plan development process.

Weapons Engineering Tritium Facility (WETF)–Programmatic Operations: On Thursday, WETF personnel successfully completed a programmatic function test of a tritium gas transfer system research and development unit. This significant milestone marks the first time WETF operators have conducted a function test since July 2011.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 3, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 3, 2016

Weapons Engineering Tritium Facility (WETF)–Operations: On Tuesday, an operator was performing a surveillance on the tritium monitoring system when he operated an incorrect switch on the back of a tritium monitor. After determining the incorrect switch was functioned, the operator inappropriately repositioned the switch without stopping and informing management as required. This action also activated the facility evacuation alarm and all personnel evacuated to the facility control room. The same sequence of events occurred in December 2015 (see 1/30/2016 weekly). In the previous event, WETF management determined that the appropriate corrective action was to label the switches. In the current event, the switches were labeled; however, operators indicated that the labels cannot be visualized while performing the work because of the constrained visual access to the back of the panel. WETF management is evaluating more effective means of ensuring operators can easily assure they are positioning the required switch. The Site Representatives note that in the recent instance, the operators executed the associated alarm response procedure until they could verify that there was not a release of tritium into the facility—an improvement from the December 2015 event response. WETF management also convened a hot-wash to discuss this response. Participants noted that due to recent network security issues, there is currently limited means of external monitoring facility alarms and indications (e.g., from the Facility Incident Command).

Area G–Inappropriately Remediated Nitrate Salts (RNS): On Friday, Area G operators completed installation of the high capacity filter vents onto the RNS waste drums. This action is the final physical modification of the RNS waste drums required to meet the safe storage requirements identified in the currently implemented revision 5 of the Evaluation of the Safety of the Situation. NNSA and EM personnel continue to review revision 6, which covers the path forward for the pipe overpack containers with RNS waste, the wildland fire threat, and the aircraft crash scenario for Dome 375.

Area G–Emergency Management: LANL Fire Protection personnel recently worked with the Los Alamos County Fire Department (LAFD) to correct the post-start finding related to pre-incident planning for the RNS waste (see 5/13/16 weekly). LAFD recently revised the pre-incident plan for Dome 375 to correct 20 of the 21 identified issues including: providing an accurate description of the dome’s current function, contents, and associated hazard (i.e., storage of RNS waste); updating after-hours and other contact information; and correcting information on available exits, floor slopes, and detection equipment. Of note, this revision did not include an update on strategies for response to events associated with the unique hazards of the RNS wastes. As such, there continues to be no documented guidance on tactics responders should use for emergencies involving these materials. NNSA Field Office personnel are currently engaging with LAFD to rectify this situation.

Emergency Management: Late last month, LANL management issued the after-action reports from the 2nd quarter exercise of the Emergency Operations Center and the chlorine release exercise at the Plutonium Facility (see 4/1/16 weekly). For the former, they determined that all objectives were met with six opportunities for improvement, including the need to formalize a process for collapsing protective actions and protective action recommendations based on actual field data. For the latter, they identified two findings regarding exercise simulation and facility command not developing incident objectives. There were also seven opportunities for improvement, two notably associated with personnel ignoring and/or confusion with direction to shelter-in-place.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 10, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 10, 2016

DNFSB Staff Activity: R. C. Eul observed the training on causal analysis and corrective action development discussed below. On Thursday, B. K. Caleca, M. W. Dunlevy, and T. J. Dwyer conducted a teleconference with personnel from the NNSA Field Office and LANL to follow-up on actions from last month's working group meeting on additional seismic analysis for the Plutonium Facility.

Federal Oversight: A team of experienced personnel from across the DOE complex conducted an Organizational Health Assessment of the NNSA Field Office. The team's objective, executed primarily through interviews, was to identify challenges to enhancing organizational effectiveness for a nuclear safety environment, including follow-up on a number of recent employee concerns raised regarding the manner used for resolution of divergent views on issues.

Continuous Improvement: On Tuesday and Wednesday afternoon, Quality and Performance Assurance (QPA) personnel conducted training on techniques for causal analysis and corrective action development. The training supports a key initiative under LANL's Performance Assurance Improvement Plan and was the second instance of a substantially reinvigorated version of the course that until recently had been dormant for several years. The course was well attended with personnel from a diverse set of roles across the laboratory. QPA management also intends to supplement the training with recurring workshops to sustain analyst development.

Plutonium Facility–Safety Basis: Last Friday, LANL management transmitted to the NNSA Field Office for approval the 2016 annual update to the documented safety analysis (DSA) and technical safety requirements (TSR). This submittal joins a large number of documents supporting the facility's safety basis, which currently consists of portions of DSA and TSR documents from 2015, 2014, and 2011, plus five Evaluation of the Safety of the Situation documents, two temporary modifications to the safety basis, and a different revision of the 2015 DSA and TSR awaiting implementation. Plutonium Facility management utilizes a 26-page TSR implementation matrix to facilitate configuration management of this challenging situation.

The approach to consolidate most of these documents relies on a different version of the 2014 DSA and TSR that contains a modern hazards analysis, but that remains under comment resolution with the NNSA Field Office. Once the comments are resolved, LANL safety basis analysts will then need to update this DSA and TSR to reflect the various changes that have occurred since it was originally drafted and then resubmit for NNSA approval. There is no formal schedule associated with this process, but considering additional time for implementation, safety basis personnel estimate that the facility is optimistically another year or two from achieving a consolidated, modern DSA and TSR.

Area G–Inappropriately Remediated Nitrate Salts (RNS): LANL, NNSA, and EM personnel continue to debate alternative approaches to the safety basis strategy formally submitted by LANL in April to support final treatment of the RNS wastes (see 4/22/16 weekly). The prolonged debate continues despite the fact that the first two revised safety basis documents for onsite transportation and the Waste Characterization, Reduction, and Repackaging Facility are due next week according to the project plan.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 17, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 17, 2016

Transuranic Waste Facility (TWF) Project: Last Friday, the NNSA Field Office Manager approved LANL's request for relief from previous directed actions in order to allow for a revised hazards and accident analysis (see 5/27/16 weekly). LANL management believes this approach has the potential to derive a revised control set, including the possibility of no longer crediting the fire suppression system. As part of the approval, the NNSA Field Office also requested a strategy to accomplish submission and approval of the revised approach in the 100 % Documented Safety Analysis by the end of this August.

Plutonium Facility–Emergency Management: On Wednesday, Plutonium Facility personnel conducted their annual nuclear criticality exercise. This year's scenario examined the response to a pulsing slurry system, one heavily exposed individual with radiation sickness, and one non-viable individual that remained at the scene of the accident. Initial feedback from players and controllers indicated problems with the annunciation of alarms in several buildings, inattentiveness of workers to a fellow injured worker, some workers not properly responding to the alarm, and exercise control issues associated with the dose readings used to simulate the event.

Plutonium Facility–Seismic Safety: On Thursday, LANL management transmitted to the NNSA Field Office a revision to the Evaluation of the Safety of the Situation (ESS) regarding potential non-conservatism in the seismic capacity of the fire suppression system. This ESS covers one of the primary concerns articulated in the Board's letter dated May 12, 2016. The ESS revision addresses comments from the NNSA Field Office on the April submission (see 4/22/16 weekly). The conclusion of the revised ESS remains the same—that the material-at-risk limits and other controls in place provide reasonable assurance of adequate protection without crediting the fire suppression system for post-seismic fires.

Area G–Emergency Management: On Tuesday, Area G management conducted a fact-finding regarding the responses for two separate instances where operators identified bulging low-level waste containers. In both cases, LANL HAZMAT crews determined that the drums were empty and did not contain radioactive or chemical contaminants. The fact-finding revealed concerns with the quality of data contained in the Waste Characterization and Tracking System (WCATS). For example, WCATS did not contain the genealogy for one of the drums and did not identify the other as previously bulged due to freezing as indicated by a hand-written note on the drum. The fact-finding also identified a concern regarding ensuring that contact information is appropriately logged for individuals during the process of granting unescorted access to the facility. This was revealed after a painter working alone had a delayed exit because his pager was not registered to receive evacuation instructions. Lastly, the fact-finding identified the need to heighten awareness of unexpected conditions for waste containers, including those containing low-level waste. Management is developing corrective actions for each of these concerns.

Area G–Inappropriately Remediated Nitrate Salts (RNS): On Monday, LANL management proposed to NNSA and EM management a revised strategy for the safety basis changes needed to support final treatment of the RNS waste (see 6/10/16 weekly). For each of the three facilities, they are now proposing safety basis attachments with integrated Technical Safety Requirements documents. This approach is consistent with DOE-STD-3009 and DOE-STD-1104 and will include application of the process for *Existing Facilities with Mitigated Offsite Consequence Estimates over the Evaluation Guideline*.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 24, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 24, 2016

DNFSB Staff Activity: D. M. Gutowski participated in Site Representative Office activities to compare and contrast practices with the Hanford Site. On Tuesday, M. R. Bradisse, B. K. Caleca and P. J. Foster conducted a teleconference with the Transuranic Waste Facility project personnel to discuss commercial grade dedication processes used for a seismically-actuated electrical shutoff switch.

Weapons Engineering Tritium Facility (WETF)–Safety Basis: WETF management entered their New Information process for two separate issues. First, during a fact-finding associated with a failed weekly surveillance on the Oxygen Monitoring System (OMS) for the Load-out glovebox, they discovered that the “fail” light condition is not indicated remotely in the operations center nor via local indication. As a consequence, this inoperable condition is only detectable when personnel physically open the door to the OMS module, which had previously only been performed as part of the weekly surveillance. The safety basis credits local indication as Safety Significant. As an interim corrective action, WETF management has added visual inspection of the modules to the daily rounds. The second New Information issue concerns the potential for the tritium beta decay to induce radiolysis in tritiated water stored in a type of container known as the AL-M1. Personnel from the Savannah River Site raised this question during observation of WETF activities with AL-M1s.

Emergency Management: On Monday, Emergency Operations Center (EOC) personnel conducted their quarterly exercise. The scenario involved a seismic event with a tritium release at WETF, concurrent high explosive operations at the Dual Axis Hydrodynamic Test Facility, and minor damage and elk-related injuries elsewhere across the site. At the hotwash, players generally noted positive performance.

Plutonium Facility–Safety Basis: On Thursday, the NNSA Field Office approved LANL’s request to further extend the Evaluation of the Safety of the Situation/Justification for Continued Operations (ESS/JCO) governing nuclear criticality safety for two rooms in the facility vault. The new expiration date is January 5, 2017. The Field Office last granted a six month extension in January 2016 for this ESS/JCO that originated in 2012 (see 1/22/16 weekly). The Field Office approval letter notes that additional time is needed to complete the criticality safety evaluation documents, resolve comments, and implement the documents once approved.

Plutonium Facility–Safety Basis: Last Thursday, operations personnel declared a process deviation after observing plutonium oxide in taped slip-lid containers in quantities that required a water-resistant container per the criticality safety posting. NNSA Field Office management expressed disappointment, as this operation had recently successfully completed a federal readiness assessment.

Plutonium Facility–Operations: Workers righted the multi-thousand pound safe that tipped into a glovebox line last month (see 5/27/16 weekly). The glovebox will remain out of service until a modification can be made to restore confinement capability to the damaged gloveport.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 1, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 1, 2016

DNFSB Staff Activity: On Tuesday, DNFSB staff members conducted a teleconference with LANL and NNSA Field Office personnel to discuss revisions to the addendum to the Area G Emergency Planning Hazard Assessment (EPHA) associated with emergency response for accidents involving the inappropriately remediated nitrate salt waste. On Thursday, DNFSB staff members conducted another teleconference with LANL and NNSA Field Office personnel to discuss dispersion modeling protocol with emphasis on its application for the safety basis at the Transuranic Waste Facility.

Area G–Inappropriately Remediated Nitrate Salts (RNS): On Tuesday, Area G personnel secured power to the Dome 375 Permacon in order to safely conduct a replacement activity on a lightning protection system component. In addition, personnel used this opportunity to obtain images of the inside of the electrical cabinets to support design of a proposed backup electrical power supply. The outage lasted about two hours and was conducted during the cooler morning temperatures to accommodate securing the Permacon ventilation system. Despite these conditions, the Permacon temperature rapidly increased from about 58 to 73° F, nearly putting the facility into the associated action statement for the Limiting Condition for Operations. The Site Representatives note that this experience underscores the need to expeditiously install a backup power capability. LANL and EM Field Office personnel are currently working through the contractual arrangements needed to support moving forward with such capability.

Area G–Emergency Management: On Wednesday, Area G personnel conducted their annual EPHA exercise. This year’s scenario examined the response to an exothermic chemical reaction involving a drum of RNS waste, as indicated by a fire alarm and the simulated detection of radioactivity by the electronic continuous air monitor (eCAM) placed adjacent to the ventilation system exhaust. The activation and response of the eCAM was a novel aspect of the scenario, particularly since these units do not provide indication of release locally or at the Area G operations center and are managed by a separate entity at LANL. As an aside, Area G management is pursuing installation of new continuous air monitors that will improve direct notification. In addition to Area G personnel, exercise participants included the Emergency Operations division, LANL Hazardous Materials and Field Monitoring Teams, and the Los Alamos County Fire Department. Area G management noted several areas for improvement to be captured in the after action report. The Site Representatives note that the response was governed by the existing EPHA. Once approved and implemented, the revised EPHA addendum discussed on Tuesday would increase protective action distances for this scenario by a factor of about four.

Area G–Safety Basis: After receiving comments from NNSA and EM reviewers, LANL management determined that they will revise and resubmit a new version of revision 6 of the Evaluation of the Safety of the Situation for the RNS wastes. Revision 6 provides analysis and controls related to the potential threat from a wildland fire and establishes the path forward for the RNS contained in pipe overpack containers. While these containers do not yet have pressure relief devices installed, LANL personnel believe the design of the containers make them less susceptible to thermal runaway reactions. Separately, NNSA Field Office personnel concluded that they agree with the revised safety basis strategy for final treatment of the RNS waste (see 6/17/16 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 8, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 8, 2016

DNFSB Staff Activity: On Wednesday and Thursday, Deputy Technical Director R.E. Tontodonato observed the activities of the Site Representatives. Observations included discussions with senior LANL management, attending the Plutonium Facility fact-findings described below, and walk-downs of multiple defense nuclear facilities.

Plutonium Facility–Criticality Safety: On Wednesday, Plutonium Facility personnel recognized that they had mistakenly moved a container of plutonium oxide into a glovebox with a criticality safety evaluation that allowed only metal. Following discovery of this error, operators declared a process deviation, paused operations, isolated the area and made appropriate notifications as required. During a fact-finding for the event, management noted that a recent process deviation (see 6/24/26 weekly) had occurred using the same general nuclear material movement procedure that was used during this operation. In response to this earlier event, management initiated a causal analysis to include evaluation of the general move procedure and its contribution to the event. For the more recent process deviation, management will evaluate the results of the causal analysis against the findings from this event in an attempt to identify systemic issues with material movement operations. Additionally, management is seeking opportunities to improve the pre-job brief process to place more emphasis on criticality safety.

Plutonium Facility–Operations: On Wednesday, Plutonium Facility personnel conducted a fact-finding after the NNSA Facility Representatives identified several items in a glovebox that appeared potentially melted and charred. The items were located in a glovebox that is associated with the bench-scale recovery line, an aqueous operation that uses several multi-liter open top vessels to purify heat-source plutonium (i.e., material enriched in plutonium-238). Personnel presented pictures of several degraded items including a plastic graduated cylinder, a ground fault interrupt electrical cord, a pipettor, and a slip-lid container full of acid-soaked cellulosic rags. Operations personnel described two recent spills—one that occurred during processing of plutonium-238 rich solution and one that occurred as part of moving acid reagent. The consensus of the LANL personnel at the critique was that the degradation was caused by the harsh environmental conditions resulting from the spills of nitric and hydrofluoric acids, along with the high alpha radiation from the plutonium-238. The notable corrective actions are to have a fire protection engineer walk-down the glovebox and have the waste management coordinator review the acceptability of cellulosic rags soaked with a plutonium-238 containing nitric acid solution. The Site Representatives note that issues with similar rags contributed to the August 5, 2003, radioactive material uptake event that was subject to a DOE Type B Accident Investigation.

Area G–Inappropriately Remediated Nitrate Salts (RNS): On Tuesday, Area G management declared implemented revision 5 of the Evaluation of the Safety of the Situation (ESS) for the RNS waste. Last Thursday, they also issued a standing order to implement compensatory actions, directed actions, and conditions of approval that are not embodied by existing procedures. Notably, this standing order includes a provision to ensure the defensible space with respect to vegetation is maintained around the Dome 375 Permacon, as required by ESS revision 6 (which was previously submitted, but is now under additional revision). The defensible space control is one of two key input assumptions used in the wildland fire model to demonstrate temperatures do not threaten the RNS wastes. The other control, additional combustible loading limits within the dome, is not yet implemented pending further study.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 15, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 15, 2016

DNFSB Staff Activity: On Thursday, M.W. Dunlevy, R.L. Jackson, and R.V. Kazban conducted a teleconference with LANL and NNSA Field Office personnel to discuss the safety design strategy for the Plutonium Facility Equipment Installation Phase 1 subproject.

Area G–Inappropriately Remediated Nitrate Salts (RNS): On Thursday, LANL, EM, and NNSA personnel held the first of a series of in-process reviews of safety basis documents needed to support RNS treatment. The goal of these reviews is to foster timely feedback from the various federal review personnel in support of achieving expeditious treatment—development and approval of safety basis documents is nearing the critical path for treatment. This first review meeting focused on the Area G safety basis changes necessary to move the RNS waste drums from the Dome 375 Permacon to the vehicle that will be used to transport the drums to the Waste Characterization Reduction and Repackaging Facility (WCRRF) for processing. Of interest, LANL and NNSA Field Office personnel presented an alternative approach that pursues defending certain RNS accidents as beyond extremely unlikely. The review team agreed to consider the viability of this approach next week. The Site Representatives note that additional technical justification for making this assertion will likely be needed. In particular, the NNSA Cognizant Secretarial Officer acknowledged in the most recent safety basis approval letter that installation of pressure relief devices will significantly reduce the likelihood of a self-initiated thermal runaway; however, he ultimately concluded that the risks associated with the RNS wastes will not be completely eliminated (see 4/29/16 weekly). Additional in-process reviews are planned for the coming weeks to discuss safety basis changes for Area G, onsite transportation and WCRRF. LANL personnel indicated they remain on target for document submittal by August 15, 2016. DOE personnel expect to take an additional two weeks to review and approve the documents.

Plutonium Facility–Criticality Safety: On Wednesday, Plutonium Facility management issued a shift order change to improve performance during nuclear material movements within the facility. Management issued this change as a temporary corrective action for recent criticality safety process deviations that occurred during two separate material moves (see 7/8/16 and 6/24/16 weeklies). The change incorporates two newly developed tools to aid operators, including a material move planning tool and a nuclear criticality safety verification checklist. In addition to directing operators to use these tools for material move planning, the shift order change requires the first line manager to be informed prior to material movements being performed. These changes are in addition to an earlier standing order to utilize the material move procedure as Use Every Time. Facility personnel are currently revising this material movement procedure to more permanently implement these temporary corrective actions, as well as to address issues that were identified by a causal analysis of these process deviations.

Weapons Engineering Tritium Facility (WETF)–Safety Basis: This week, facility personnel completed an Implementation Verification Review for the most recently approved revision of the WETF Documented Safety Analysis and Technical Safety Requirements. Of significance, this safety basis revision reduces the material-at-risk allowed in the facility to 60 percent of the current limit and reduces the consequences of the worst case postulated accident scenario to below the DOE Evaluation Guideline (see 5/13/16 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 22, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 22, 2016

DNFSB Staff Activity: M.W. Dunlevy was on site to support Site Representative activities including observation of the commencement of the Contractor Readiness Assessment for Plutonium Pyrochemical Operations, meetings with senior NNSA Field Office management, and a walkdown of the Plutonium Facility and associated technical area. On Friday, C.T. Beaty, T.L. Hunt, and A.M. Hutain conducted a teleconference with LANL and NNSA Field Office personnel to summarize their observations made during an onsite review of the LANL emergency management program (see 4/15/16 weekly).

Area G–Inappropriately Remediated Nitrate Salts (RNS): On Wednesday, LANL management presented to the NNSA Field Office the safety basis review team’s final decision for the planned safety basis approach to support RNS treatment. The safety basis review team has determined that the alternate approach to pursue defending certain RNS accidents as beyond extremely unlikely that was proposed during last week’s in process review would be abandoned (see 7/15/16 weekly). Instead, the team will continue with the original plan to develop the necessary safety basis attachments with integrated Technical Safety Requirements documents that will include application of the DOE-STD-3009 and DOE-STD-1104 process for *Existing Facilities with Mitigated Offsite Consequence Estimates over the Evaluation Guideline* (see 6/17/16 weekly). The safety basis review team expects to meet again next week to finalize the details of the Area G safety basis changes and to start focusing on the details necessary to support a revision to the Waste Characterization, Reduction, and Repackaging Facility safety basis to complete treatment of the RNS into an acceptable form for disposal.

Weapons Engineering Tritium Facility (WETF)–Safety Basis: Last Friday, the Implementation Verification Review team for the most recently approved revision of the WETF Documented Safety Analysis and Technical Safety Requirements presented the results of their review to WETF management (see 7/15/16 weekly). The team identified one finding with a new Surveillance Requirement to conduct a visual inspection of the wet pipe sprinkler system. The surveillance requires the distance between the bottom of sprinkler heads and stored equipment or material to be greater than 18 inches. The review team identified instances where this requirement was not met. The team concluded that once this finding is adequately addressed WETF personnel have demonstrated implementation of the safety basis change.

Plutonium Facility–Restart Activities: On Wednesday, Plutonium Facility personnel commenced the Contractor Readiness Assessment for Plutonium Pyrochemical Operations. This week, review team members performed document reviews, observed metal chlorination and chlorine gas delivery system calibration activities, and conducted interviews with facility personnel performing and supporting this activity. The review team is scheduled to continue with similar activities throughout next week and expect to have the review and a draft of the final report completed by next Friday. Plutonium Pyrochemical Operations are the final planned activities of the Plutonium Facility resumption project following the LANL Director’s decision to pause operations in June 2013.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 29, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending July 29, 2016

DNFSB Staff Activity: On Thursday, R.L. Jackson, conducted a teleconference with LANL and NNSA Field Office personnel to out-brief observations from the review of the safety design strategy for the Plutonium Facility Equipment Installation Phase 1 subproject.

Emergency Management: This week, LANL personnel hosted the annual HazMat Challenge for various regional hazardous materials responders, including the Los Alamos County Fire Department. In addition to some new scenarios, LANL personnel leveraged the institutional drill program processes to improve the training value of the event. In particular, the LANL organizers significantly increased the duration for each scenario to achieve a more realistic response and provided each team with a detailed written evaluation.

Area G–Inappropriately Remediated Nitrate Salts (RNS): On Monday, LANL received approval from the New Mexico Environment Department on the permit modification needed to support treatment of the RNS waste. Despite this achievement, approval of the safety basis documents continues to pace the treatment schedule. At this week's in-process review, LANL managers indicated that they remain on track to submit the documents by the middle of August. However, NNSA reviewers continue to finalize their review plan and attempt to deconflict several competing priorities to support the approval need date reflected in the project schedule.

Plutonium Facility–Operations: On Tuesday, Plutonium Facility management convened a second fact-finding to review the degraded items found in a plutonium-238 glovebox (see 7/8/16 weekly). After an improved attempt to construct a timeline, LANL personnel reaffirmed their prior conclusion that the degradation was the result of radiolytic and acid attack. Specifically, the operators present during a spill of a plutonium-238 rich, high molar nitric acid solution, stated that they tossed the cellulosic rags used to soak up the spill into the adjacent dropbox. As a result, they believe that the rags likely came into contact with the items that became degraded. Corrective actions include an effort to review spill response procedures, continued review of waste acceptability, and review of prior corrective actions from the 2003 Type B and 1994 Type C accident investigations. The Site Representatives note that the latter accident involved two instances where cellulosic wipes (i.e., cheesecloth) used in plutonium-238 operations ignited. In addition, recent LANL testing in support of RNS treatment indicated that cellulosic wipes that have contacted nitrate solutions possess the ignitability characteristic (D001).

Plutonium Facility–Criticality Safety: On Monday, Plutonium Facility management declared a criticality safety process deviation when inaccuracies in criticality safety postings for two outdoor transuranic waste storage pads were identified. These inaccuracies included: (1) misspellings, some technical in nature, (2) the second page of a two page posting was missing, (3) two revisions of the same posting were posted in the same area, and (4) the actual postings on the storage pad were not maintained in the facility document management system. During a fact-finding of the event, facility personnel identified a number of issues with the processes used to ensure configuration management during implementation of procedural revisions that include criticality safety postings. Management intends to develop a lessons learned that emphasizes the approved process to implement procedure revisions. Additionally, operators will develop a process to ensure the technical accuracy of postings and to frequently evaluate outdoor postings to verify their physical integrity.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 5, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: R.K. Verhaagen and J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending August 5, 2016

DNFSB Staff Activity: On Thursday, B.K. Caleca, M.W. Dunlevy, T.J. Dwyer, and A.H. Hadjian conducted a teleconference with NNSA and LANL contractor personnel to discuss planning for the request for proposals covering additional seismic analyses and testing for the Plutonium Facility.

Area G–Inappropriately Remediated Nitrate Salts (RNS): Updates on a few key actions:

- The NNSA Field Office review and approval of the Evaluation of the Safety of the Situation (ESS) concerning transuranic waste inventory discrepancies continues. There currently is no schedule for the review of this document, which was submitted on May 13, 2016 (see 5/20/16 weekly).
- LANL continues to develop the submittal package for revision 6.1 of the ESS concerning the RNS waste. In mid-June, the NNSA Field Office informally discontinued review of revision 6.0 after there was consensus that several changes were needed. Approval and implementation of revision 6.1 is needed to disposition the wildland fire and aircraft crash scenarios, as well as authorize installation of the pressure relief devices on the pipe overpack containers holding RNS waste.
- LANL engineering personnel continue to finalize the design and cost estimate for a backup electrical power capability to the Dome 375 Permacon. NNSA personnel became concerned about the lack of backup power following a loss of power event this spring (see 4/1/16 weekly).
- Area G safety basis personnel provided NNSA and EM personnel with high quality drafts of the safety basis documents for Area G and the Waste Characterization Reduction and Repackaging Facility (WCCRF). They hope this approach will facilitate timely federal review and approval.
- Area G personnel have established a high fidelity mockup of the WCRRF glovebox and are using it to prove out procedures for the mixing and blending operations needed for RNS treatment.

Plutonium Facility–Restart Activities: Last Friday, the Contractor Readiness Assessment (CRA) team completed their review of Plutonium Pyrochemical Operations (see 7/22/2016 weekly). The CRA team identified two pre-start findings: (1) inadequate hazard assessment and abatement for the Chlorine Gas Delivery System and (2) ineffective implementation of criticality controls into operating procedures to ensure criticality safety limits are protected in a sustainable manner. The team also identified one post-start finding related to deficiencies with facility Contractor Assurance and Issues Management systems and questioned whether these systems were adequate to support future resumption efforts and ensure sustainment of ongoing operations. Overall the team concluded that subject to satisfactory resolution of the pre-start findings, LANL has demonstrated its readiness for equipment, procedures, and personnel to safely support Plutonium Pyrochemical Operations. Of note, the Line Management Review Team chartered by the NNSA Field Office to shadow this review (see 5/6/2016 weekly) is developing a summary report documenting their conclusions and recommendations on LANL's readiness to proceed with the Federal Readiness Assessment.

Weapons Engineering Tritium Facility (WETF)–Safety Basis: On Thursday, WETF personnel completed corrective actions from the Implementation Verification Review of the most recently approved revision of the WETF Documented Safety Analysis and Technical Safety Requirements. The Facility Operations Director declared the new safety basis implemented which marks a significant milestone by lowering facility material-at-risk limits to a level that reduces the consequences of the worst case postulated accident scenario to below the DOE Evaluation Guideline.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 12, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending August 12, 2016

Area G–Inappropriately Remediated Nitrate Salts (RNS): On Thursday, LANL management transmitted to the NNSA Field Office revision 6.1 of the Evaluation of the Safety of the Situation (ESS) concerning the safe storage of the RNS waste. Revision 6.1 includes refinements to the wildland fire calculation that considers the heat contribution from burning the as-found combustibles within Dome 375. This and other refinements derived from peer review, result in a new maximum credible waste temperature of 35 °C—an increase from the prior calculation, but still below the 40 °C threshold of concern. Revision 6.1 also includes new technical references to support installation of pressure relief devices on the 8 remaining pipe overpacks containing RNS waste and a reference to support no additional action prior to final treatment of the 4 pipe overpack containers with WasteLock waste. The project schedule anticipates federal approval of revision 6.1 by September 7, 2016, with relief device installation to be completed a week later.

Notably, revision 6.1 does not incorporate the NNSA Cognizant Secretarial Officer's view expressed in the approval letter for ESS revision 5 that the pressure relief devices do not completely eliminate the risk of a self-initiated thermal runaway reaction (see 4/29/16 weekly). Notwithstanding this fact, the NNSA Field Office intends to submit revision 6.1 to DOE Headquarters for approval and also expects forthcoming safety basis attachments for RNS treatment to acknowledge this fact and adhere to the process for mitigated accident consequences that exceed the evaluation guideline.

On Tuesday, the EM Field Office issued contracting direction to LANL to begin work on the procurement and installation of backup electrical power for the Dome 375 Permacon. The current project schedule anticipates this capability to be ready by October 3, 2016.

Emergency Management: On Thursday, the NNSA Field Office rescinded direction from 2009 concerning the need for federal approval of certain emergency management related documents. Specifically, the direction restores federal review and approval prior to implementing Emergency Plans, Emergency Planning Zones, Emergency Readiness Assurance Plans, Emergency Planning Hazard Analyses, and site exercise packages, as required by DOE Order 151.1C, *Comprehensive Emergency Management System*.

Plutonium Facility–Safety Basis: On Thursday, the NNSA Field Office approved the ESS regarding certain sealed sources used for the High Efficiency Neutron Counter at Technical Area-55 (see 4/29/16 weekly). LANL submitted this ESS on July 8, 2016, following a declaration of a Potential Inadequacy of the Safety Analysis on April 27, 2016. In the approval letter, the NNSA Field Office determined the ESS is acceptable due to the relatively low risk associated with these sources and an additional compensatory measures that requires the sources be containerized when not in use and outside of their normal fire-rated storage safes. The approval letter concluded that based on this information, removing the initial operational restrictions of storing the sources in fire-rated safes, ensuring operations with the sources are continuously attended, and excluding nearby use of fuels is also acceptable. The related ESS for Area G remains under review by NNSA Field Office.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 19, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaué
SUBJECT: Los Alamos Report for Week Ending August 19, 2016

Plutonium Facility–Issue Recurrence: The recent spill of about 100 mL of solution containing an estimated 10 g of plutonium-238 in 9.8 M nitric acid and hydrofluoric acid (see 7/8/16 and 7/29/16 weeklies) brought to light the practice of using cellulosic materials (i.e., cheesecloth) as an absorbent for acid spills despite strong evidence indicating that this can create a chemically unstable material. In 1994, LANL requested an emergency permit from the New Mexico Environmental Department to allow treatment of plutonium-impregnated nitrated cheesecloth to remove hazardous waste characteristics of ignitability and reactivity. Additionally, the Plutonium Facility has been the subject of two formal accident investigations concerning this material, including two instances in 1994 of the material self-igniting due to the presence of plutonium-238. A 2006 memo documenting corrective actions from the 2003 Type B accident notes this material is considered a potential fire hazard, as does current institutional LANL guidance for spill response. Other sites (e.g., Savannah River Site) have long prohibited the use of cellulosic material for acid applications. From about 2009 to 2015, LANL procedures for plutonium-238 glovebox cleanup acknowledged this hazard, emphasized minimizing use of cheesecloth, and provided operators with explicit instruction for rinsing, handling, and stabilization of cheesecloth through pyrolysis.

On Thursday, Plutonium Facility management responded to a request from the NNSA Field Office for information regarding the safety and waste management implications of the continued use of cheesecloth. LANL management maintains that these materials are covered by the safety basis and represent an acceptable waste form. Further, they assert that reporting is unnecessary under a DOE data call (OE-2: 2015-1) which focused on the addition of organic absorbents to “nitrate-bearing” transuranic waste streams because cellulose cannot be chemically nitrated solely by nitric and hydrofluoric acids. The Site Representatives note that LANL’s own experiments indicate that the organic cat litter that caused the Waste Isolation Pilot Plant radiological release event did not require the waste to be chemically nitrated, but was nitrate-bearing and therefore represented an ignitable material and an unsuitable waste form. Plutonium Facility management has temporarily suspended the use of cheesecloth for acid spills while they develop a paper to address the chemistry of this application.

Plutonium Facility–Infrastructure: Last week, LANL management provided the NNSA Field Office with a proposal for a revised execution strategy for Phase C of the TA-55 Reinvestment Project II. In order to accommodate cost overruns, the strategy proposes to defer scope on several elements. NNSA is currently reviewing the proposal, which includes:

- The Criticality Alarm System will be completed under its current reduced scope.
- The Uninterruptible Power Supply building will be completed with the exception of the batteries, automated transfer switch, and cable connection to the Plutonium Facility.
- The remaining Plutonium Facility exhaust stack work will be suspended.

Transuranic Waste Facility Project: Last week, the NNSA Field Office approved permanent equivalencies to several National Fire Protection Association code requirements for this newly constructed facility. The equivalency covers a missing drain valve, an undersized pipeline on the pump test header, an undersized pump test flow meter, and an insufficient flush rate for the pump suction pipeline. The approval letter concludes that no adverse reliability concerns are posed by LANL’s proposed equivalencies for these conditions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 26, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending August 26, 2016

DNFSB Staff Activity: Board Member Hamilton, accompanied by staff members C.T. Beaty and M.W. Dunlevy, observed the annual full-scale exercise discussed below.

Emergency Management: LANL personnel conducted their annual full-scale exercise. This year's exercise spanned three days and involved a force-on-force security event at the Plutonium Facility that resulted in the simulated breach of confinement and release of radioactive material. Players included the full Emergency Response Organization, the LANL protective force, the Federal Bureau of Investigation, the Los Alamos Medical Center, the Los Alamos County Fire Department, and several other entities from the county. The player hotwash and controller critique are scheduled for next week.

Plutonium Facility–Infrastructure: On Tuesday, Plutonium Facility operators placed the facility into Mode 2–Standby after the 14 day limit in the Technical Safety Requirements (TSR) had elapsed to restore operability to one of the diesel firewater pumps. Maintenance personnel are currently working with the equipment vendor to resolve issues with head gaskets. Per the TSR, they have 50 days to restore operability while in Mode 2—if not, the TSR action statements require the containerization of all material-at-risk. The TSR defines containerization as a metal container for solids and a glass or plastic closed top container for liquids—there are no further specifications on the fire resistance of the containers even though the facility has credited fire-resistant container types. While it is unlikely to be needed in this instance, the Site Representatives note that the facility has not previously demonstrated the ability to containerize all material-at-risk and question whether this action statement is executable. Area G and the Weapons Engineering Tritium Facility have encountered similar issues with their TSRs. Other current equipment and infrastructure issues include:

- Both emergency diesel electric generators are out of service since February 2015 and May 2016. The safety basis does not credit these electric generators.
- One of the instrument air compressors has been out of service since April 2015. Instrument air is a safety significant support system for the ventilation system. The facility is currently running on an alternate compressor.
- Questions on the fittings for fire suppression system challenge its ability to meet its safety significant performance criteria to remain operable following a performance category 2 seismic event.

Safety Basis: The NNSA Field Office recently approved two Evaluations of the Safety of the Situation (ESS) associated with damage ratios (DR) for pipe overpack containers (POC) at the Plutonium Facility and Area G. LANL submitted these ESSs in September of 2015 (see 9/4/15 weekly). In the approval letters, the NNSA Field Office notes that insufficient technical information exists to justify any DR value other than one under thermal insults, but allows the continued use of non-zero DRs until ongoing POC thermal testing has been completed. Of note, LANL only currently uses a DR other than one for the Plutonium Facility.

Confinement Vessel Disposition Project: Last week, project personnel received the fifth vessel for processing. They commenced processing this week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 2, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending September 2, 2016

DNFSB Staff Activity: D.J. Brown observed federal readiness activities for Plutonium Pyrochemistry Operations on Monday through Wednesday. C.T. Beaty observed the player hotwash and evaluator critique from last week's full-scale exercise on Monday and Tuesday.

Plutonium Facility–Issue Recurrence: On Thursday, Plutonium Facility management issued an extent-of-condition review on the use of cheesecloth with nitric acid and plutonium-238 (see 8/19/16 weekly). They elected to issue the extent-of-condition review in lieu of a technical white paper defending the practice due to the number of internal peer review comments received on the draft white paper and more importantly, a recognition conveyed in the transmittal email that they should not have generated these materials and do not intend to generate them in the future. The review utilized the Waste Compliance and Tracking database and identified that of the 2513 waste containers generated since 2010, 174 may contain cheesecloth and plutonium-238. Of these, 84 were generated as a result of aqueous scrap recovery operations that use nitric acid, but none mention the word spill in the comments section of the records. They did identify two containers with plutonium-239 and comments indicating the presence of these materials and the word spill. The memo indicates that this validates the usefulness of the comments field. However, the Site Representatives note the waste visual inspection procedure does not provide operators details on what should be populated in the comments field. The cheesecloth from the June spill remains in three pipe overpack containers not yet declared as waste, and is expected to be reintroduced into a glovebox for treatment.

Federal Oversight: On Wednesday, the leader of the team that conducted an Organizational Health Assessment of the NNSA Field Office briefed the results of the review at a field office all hands meeting (see 6/10/2016 weekly). The team's objective, executed primarily through interviews, was to identify challenges to enhancing organizational effectiveness for a nuclear safety environment, including follow-up on a number of recent employee concerns raised regarding the manner used for resolution of divergent views on issues. The team identified opportunities for improvement in four general areas including leadership, learning, establishing a respectful environment, and improving the differing professional opinion (DPO) process. The NNSA Field Office Manager briefed corrective actions taken or planned that most notably included: (1) establishing a senior review board to resolve divergent views on safety basis issues; (2) revising the field office procedure on the DPO process; (3) conducting inclusion training and making improvements to the Employee Concerns Program; (4) conducting 360 reviews for the leadership team; and (5) having NNSA headquarters concur on future safety basis approvals.

Confinement Vessel Disposition (CVD) Project: On Tuesday, CVD operators paused work when they noticed a tear in the bag being used to provide confinement while removing a vessel port cover. Operators responded by covering the tear with their gloves until they could tape the tear closed. During a fact finding of the event, LANL personnel discussed whether the appropriate actions were taken because a tear in the bag could represent a potential criticality safety process deviation which would require operators to immediately move away competing with the priority to take action to maintain confinement. Management concluded that the appropriate actions were taken and noted that the procedures governing the operation could more clearly identify the desired response in the event this occurs in the future.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 9, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: R.K. Verhaagen and J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending September 9, 2016

Plutonium Facility–Restart Activities: On Wednesday, the federal readiness assessment team out-briefed the results of their review of the plutonium pyrochemistry operations. The team identified one pre-start finding related to the procedural control on steps used to place a sparging tube above a plutonium metal melt that were insufficiently rigorous to consider it an unlikely upset, as opposed to an expected off normal event in the criticality safety evaluation. The team also identified one post-start finding related to the need to verify the operability of wax coated fire sprinkler heads in accordance with National Fire Protection Association standards. During the out-brief, the team leader praised several LANL and NNSA Field Office readiness practices, opined that they were best in the complex, and announced that these practices are to be adopted for the restart of the Waste Isolation Pilot Plant.

Following successful closure of the corrective actions, LANL will have completed the revised scope of the formal restart project, restoring basic functionality to the facility's manufacturing and surveillance missions. An additional 18 readiness activities are planned for the next two years, including some new activities and some that were de-scoped from the formal restart project such as the aqueous chloride and nitrate operations.

Federal Oversight: This week, Mr. Ted Wyka, the current Director of the Office of Safety Management for DOE-EM, commenced an eight month detail to help improve safety management and culture issues affecting the work environment within the NNSA Field Office. Mr. Wyka's presence fulfills one of the corrective actions from the Organization Health Assessment (see 9/2/16 weekly) to seek improvement advice from a senior executive from outside the NNSA chain of command.

Area G–Safety Basis: Last week, Area G management declared a Potential Inadequacy of the Safety Analysis (PISA) after preliminary calculations indicated a possibility that several Flanged Tritium Waste Containers may be pressurized with an explosive mixture of hydrogen isotopes and oxygen. The gas buildup is suspected from the radiolysis of tritiated water sorbed to zeolite beds that were loaded above their recommended limit. Some of these containers also have integrity concerns related to potential corrosion issues and non-conformances related to over-torqueing of improper closure bolt types. Management has prohibited all access to the containers.

Weapons Engineering Tritium Facility (WETF)–Emergency Management: On Wednesday, WETF personnel conducted their annual emergency exercise. This year's scenario involved a malevolent act by a disgruntled employee that resulted in the release of tritium gas. Participants noted an inconsistency between the actions taken by facility personnel to ensure the safety of local personnel and the formal protective actions that the Emergency Manager declared via a simulated mass notification. Participants also discussed several issues with the integration of response by the protective force and postulated response by Los Alamos Police Department (LAPD). While LAPD did not play in the exercise, participants noted that LAPD officers do not receive the familiarity and the hazard awareness training that is provided to members of the Los Alamos Fire Department. As a result, the participants expressed concerns that the police procedures and response actions may not appropriately account for the unique hazards at certain LANL facilities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 16, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending September 16, 2016

DNFSB Staff Activity: On Thursday, B.K. Caleca, M.W. Dunlevy, T.J. Dwyer, and A.H. Hadjian conducted a video teleconference with NNSA and LANL contractor personnel to discuss details of planned seismic analyses and testing for the Plutonium Facility. Going forward, NNSA and LANL personnel intend to conduct monthly meetings with the Board's staff to present their plans for and progress on developing the request for proposal for the alternate seismic analysis of the Plutonium Facility.

Confinement Vessel Disposition (CVD) Project: On Monday, CVD operators paused work when they noticed a tear in the glovebox glove being used by one of the workers. The workers were in the process of attaching the sphere to the workstation when the tear in the glove was observed. With direction of the radiological controls technician, workers covered the glove tear with tape and continued working to place the sphere/workstation into a safe configuration. Upon exiting the gloves, contamination was detected on both inner protective gloves of the worker. After additional inspection, workers identified tears in both glovebox gloves. During a fact finding of the event, LANL personnel discussed whether the appropriate actions were taken to continue work with a known glove tear. The Site Representatives note that this is the second time in two weeks (see 9/2/16 weekly) that operators have had to make decisions balancing the risk between the safety of the sphere configuration and the required response to a breach of the confinement boundary.

Plutonium Facility–Infrastructure: On Tuesday, Plutonium Facility operators placed the facility into Mode 1–Operations following repairs and successful post maintenance testing of the previously out of service diesel firewater pump (see 8/26/2016 weekly). On Wednesday, facility operators had to enter a Limiting Condition for Operations when the tank level indicator for the other pump house malfunctioned. Facility personnel restored the level indicator to service prior to the 12 hour Completion Time that would have required them to suspend molten plutonium operations.

Area G–Safety Basis: On Tuesday, Area G safety basis personnel determined that the Potential Inadequacy of the Safety Analysis for several Flanged Tritium Waste Containers potentially pressurized with an explosive mixture of hydrogen isotopes and oxygen (see 9/9/16 weekly) represents a positive Unreviewed Safety Question. Management continues to prohibit all access to the containers while an Evaluation of the Safety of the Situation is being developed.

Area G–Inappropriately Remediated Nitrate Salts (RNS): Last week, LANL submitted to the NNSA Field Office an approved Contractor Readiness Assessment (CRA) Plan of Action for de-nesting, refrigerating, and loading RNS waste drums onto a transportation vehicle for shipment to the Waste Characterization, Reduction and Repackaging Facility (WCRRF) for treatment. This follows the NNSA Field Office Manager's approval of an amendment to LANL's Quarter 4 Fiscal Year 2016 Startup Notification Report authorizing a Federal Readiness Assessment for RNS treatment activities at WCRRF and directing a CRA for the Area G RNS activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 23, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending September 23, 2016

DNFSB Staff Activity: On Wednesday, P.J. Migliorini, J.A. Pasko, and T.J. Dwyer, conducted a teleconference with EM, NNSA, and LANL personnel to discuss issues identified by the Board's staff during a review of the safety basis documents discussed below to support treatment of the inappropriately remediated nitrate salt (RNS) waste being stored in Area G.

RNS–Safety Basis: This week, personnel from EM and NNSA headquarters, EM and NNSA Field Offices, and LANL safety basis met for four full days to finalize necessary safety basis changes for final treatment of the RNS waste currently store in Area G. The safety basis review team worked on changes to documents including the Documented Safety Analysis and Technical Safety Requirements for Area G and the Waste Characterization, Reduction and Repackaging Facility (WCRRF), as well as a temporary safety basis modification for the LANL Transportation Safety Document. LANL personnel require these safety basis changes to allow de-nesting, refrigerating, and loading RNS waste drums onto a transportation vehicle for shipment to WCRRF, and to perform final treatment. Next week, senior management from EM and NNSA headquarters will be on site to review these documents with a goal of concurring on a Safety Evaluation Report and recommending approval to the NNSA Cognizant Secretarial Officer for Safety.

Federal Oversight: On Tuesday, the NNSA Field Office Manager transmitted an Improvement Action Plan for the Organizational Health Assessment conducted in June 2016 (see 9/2/2016 weekly) to field office personnel for their information. In the correspondence transmitting the plan, the manager emphasized the goals of inclusion and transparency, in particular as they apply to developing safety basis documents. The manager has also started providing weekly notes to the field office staff in an effort to improve communications and to highlight a few thoughts for consideration and discussion. The manager indicated that the first several notes will focus on safety culture and will highlight attributes from DOE's guide on Integrated Safety Management emphasizing Leadership, Employee/Worker Engagement, and Organizational Learning.

Plutonium Facility–Restart Activities: On Thursday, The NNSA Field Office Manager approved the pyrochemical process operations Federal Readiness Assessment Corrective Action Plan and the associated pre-start objective evidence file, and authorized restart of pyrochemical operations.

Plutonium Facility–Infrastructure: On Tuesday, facility operators entered a Technical Safety Requirement Limiting Condition for Operation when a diesel firewater pump shut down on overspeed during performance of a weekly Surveillance Requirement. Facility personnel have 14 days from the time of failure to return the diesel to service before they are required to place the facility into Mode 2–Standby. This is the same diesel firewater pump that operators recently repaired and returned to service after experiencing a series of mechanical issues including previous problems with the diesel overspeed (see 8/26/2016 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 30, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending September 30, 2016

DNFSB Staff Activity: P.J. Migliorini was on site this week for an indoctrination visit as he assumes the role of the Board's Cognizant Engineer for DOE-EM activities at LANL.

Inappropriately Remediated Nitrate Salt (RNS)–Safety Basis: This week, senior management from EM and NNSA headquarters, as well as participants from DOE's Offices of Nuclear Safety and Enterprise Assessments met on site to convene a Senior Review Board (SRB) for the safety basis changes needed for final treatment of the RNS waste (see 9/23/16 weekly). SRB members included the NNSA Cognizant Secretarial Officer (CSO) for Safety, NNSA's Central Technical Authority, EM and NNSA's Chiefs for Nuclear Safety, EM's Deputy Assistant Secretary for Safety, Security, and Quality Assurance, and both EM and NNSA Field Office Managers. The SRB identified and discussed their technical issues with the Safety Evaluation Report (SER) developed to approve the safety basis changes, and presented these issues to the Safety Basis Review Team to resolve. Over the course of the three day meeting, this process resulted in the development of a SER that all members of the SRB agreed provided an adequate safety basis for treating the RNS waste. The NNSA CSO is expected to give final approval of the SER next week.

Weapons Engineering Tritium Facility (WETF)–Lessons Learned: On Thursday, WETF operations and program personnel convened a learning team to study an event that occurred during a gas transfer operation resulting in an inadvertent transfer of tritium into the Tritium Waste Treatment System. LANL uses learning teams as a Human Performance Improvement tool to improve processes, to plan work, and to learn from events. In this case, the learning team met to identify process improvements that could help prevent a similar incident in the future. The learning team identified potential process improvements that included procedural changes, equipment configuration modifications, and mentoring opportunities.

Plutonium Infrastructure Strategy: On Wednesday, the NNSA Field Office Manager approved a revision to the Safety Design Strategy (SDS) for the PF-4 Equipment Installation (PEI) subproject. The PEI subproject involves 17 gloveboxes that will house analytical chemistry and materials characterization equipment. Thirteen of these gloveboxes are existing installed equipment that will be repurposed as part of the subproject. In a previous revision of the SDS, LANL identified that eight of the repurposed gloveboxes did not meet the existing safety basis requirement for Performance Category (PC)-2 seismic criteria (see 11/6/15 weekly). In this newest revision, LANL references an engineering evaluation of the seismic qualification of these glovebox stands to conclude that these gloveboxes can meet their required PC-2 seismic criteria with a high degree of confidence because of redundancies in the seismic load path. In the approval letter, the NNSA Field Office Manager also agreed with LANL's proposed strategy to submit a safety basis page change to delete the requirement that all new glovebox stands meet PC-3 seismic criteria.

Plutonium Facility–Infrastructure: On Wednesday, Plutonium Facility personnel returned the diesel firewater pump to service (see 8/23/16 weekly) and exited the associated Limiting Condition for Operation following repair and retest.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 7, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 7, 2016

Plutonium Facility–Operations: This week, operators retrieved from pipe overpack containers the cheesecloth used to cleanup a spill of plutonium-238 in a nitric acid solution (see 8/19/16). The material is now stored in SAVY containers awaiting measurements to resolve an inventory discrepancy and pending development of the overall disposition. On Monday, facility management entered the New Information process to examine whether the hazard posed by cheesecloth and nitric acid is adequately covered in the safety basis. Previously, in response to NNSA Field Office questions, LANL management asserted the adequacy of the safety basis.

Plutonium Infrastructure Strategy: On Tuesday, the NNSA Field Office informed LANL management that it was premature to approve the safety design strategy for the upgrade of the Radiological Laboratory Utility Office Building to a hazard category 3 nuclear facility. They based their decision on funding and outstanding National Environmental Protection Act actions.

Chemistry and Metallurgy Research Building–Safety Basis: On Wednesday, facility management declared a Potential Inadequacy of the Safety Analysis after non-destructive assay measurements indicated the presence of about 550 g of Pu-239 equivalent holdup in Wing 7. This quantity exceeded the 200 g assumed in the safety basis. As an immediate action, management has reduced the allowed limit to account for this additional material-at-risk.

Emergency Management: On Wednesday, LANL issued the after action report from the August full-scale exercise (see 8/26/16 weekly). They identified that 2 of the 152 total objectives were not met. The unmet objectives involved the failure of incident command to develop and implement an action plan and the inability of the Los Alamos Medical Center to prepare for a surge of contaminated patients. There were no findings associated with these unmet objectives; however, there were 27 opportunities for improvement. Notable improvement actions involve: avoiding patching into real-world public safety radio traffic; the need to implement a formalized approach to the hotwash; several items with improving shelter-in-place actions; unfamiliarity of facility command personnel with the use of the radio system; and lack of protective actions for security personnel.

Environmental Waste Facility Operations–Facility Evaluation: On Thursday, a team briefed the results of their Facility Assessment. The team consisted of 24 personnel from outside of the Environmental Waste Facility Operations organization. The team performed the assessment in August, and focused on compliance with applicable Safety Management Programs and selected Occupational, Safety and Health elements for operations at Area G and the Waste Characterization, Reduction, and Repackaging Facility (WCRRF). The Associate Director for Nuclear and High Hazard Operations, with the assistance of the Quality and Performance Assurance Group, recently instituted the Facility Evaluation process as a mechanism for LANL to self-assess facility performance. The team identified a number of findings and opportunities for improvement, primarily in the areas of Conduct of Engineering, Conduct of Maintenance, Criticality Safety, Fire Protection, Quality Assurance, and Radiation Protection. Area G and WCRRF will use these results to help prepare for the upcoming readiness assessments on treatment of the inappropriately remediated nitrate salt waste currently stored in Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 14, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 14, 2016

DNFSB Staff Activity: P.J. Foster observed discussions between LANL and the NNSA Field Office on the final resolution of comments regarding the safety basis for the Transuranic Waste Facility.

Emergency Management: Subsequent to receiving comments from the NNSA Field Office, LANL management rescinded the after action report for the full-scale exercise (see 10/7/16 weekly). Separately, the NNSA Field Office and LANL management are negotiating implementation of DOE Order 151.1D, *Comprehensive Emergency Management System*. This revision reflects many of the improvements made under the Board's Recommendation 2014-1, *Emergency Preparedness and Response*.

Inappropriately Remediated Nitrate Salts (RNS)–Safety Basis: On Friday, the EM Field Office transmitted to LANL the Safety Evaluation Report (SER) approving the safety basis documents needed to support final treatment of the RNS waste into an acceptable waste form. The documents encompass activities at Area G, onsite transportation, and the Waste Characterization, Reduction, and Repackaging Facility. The SER includes five conditions of approval and four directed changes associated with establishing temporary road closures during transfer operations, several corrections to the documents, and the need to implement revision 6.1 of the Evaluation of the Safety of the Situation (ESS) concerning the safe storage of the RNS waste. The NNSA Field Office continues to review revision 6.1 of the ESS which is required to support treatment as it covers denesting and pressure relief device installation on the 8 pipe overpacks containing RNS waste, as well as finalizes the wildland fire analysis and associated controls.

Plutonium Facility–Nuclear Material Management: Material management personnel recently realized progress with respect to implementing some of the opportunities identified in DNFSB/Tech-39. In response to a recent timely order, programmatic operations personnel have been documenting the type of outer container in the LANMAS material accountability system for all material-at-risk (MAR) stored outside of gloveboxes on the first floor of the facility (i.e., floor locations and safes). As of this past Tuesday, they have identified all but 5 of the 247 previous unspecified containers. As a result of this information and ongoing repackaging efforts, material management personnel estimate a nearly 21 percent relative reduction in MAR against the fiscal year 2016 baseline after accounting for damage ratios for certified containers. Material management personnel are also monitoring risk reduction using the methodology specified in DOE Manual 441.1-1, *Nuclear Material Packaging*, and currently estimate a nearly 55 percent relative reduction in risk against the fiscal year 2016 baseline.

Safety Basis: DOE Standard 3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analyses*, was issued in November 2014. The NNSA Field Office and LANL management incorporated this standard into the contract as part of modification 359, which was jointly approved on August 11, 2016.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 21, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: R.K. Verhaagen and J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending October 21, 2016

The Site Representatives were at DNFSB Headquarters. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 28, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 28, 2016

DNFSB Staff Activity: On Monday, a staff team conducted a teleconference with NNSA Field Office and LANL personnel to discuss questions regarding the safety basis for the Transuranic Waste Facility.

Emergency Management: On Tuesday, LANL management reissued their after action report for the full-scale exercise (see 10/14/16 weekly). The revised report identified that 10 of 152 objectives were not met, resulting in four findings and 25 opportunities for improvement. The findings involve: non-functioning telephones at the Joint Information Center; an inappropriate radio patch that interfered with real world public safety; lack of familiarity on the part of LANL radiological control technicians of the layout and process for contaminated patient handling at the Los Alamos Medical Center; and poor implementation of an exercise freeze. The report captures the fact that a unified command was never effectively established as an opportunity for improvement and notes that it would have resulted in a finding; however, the event jurisdiction fell under the Federal Bureau of Investigation and LANL does not issue findings against external entities.

Area G–Safety Basis: LANL recently submitted to the NNSA Field Office for review and approval an Evaluation of the Safety of the Situation (ESS) for the Potential Inadequacy of the Safety Analysis (PISA) concerning newly identified explosive hazards on several Flanged Tritium Waste Containers (see 9/9/16 weekly). The ESS references a calculation that demonstrates the currently established 50 foot standoff distance is adequate to ensure safety of the workers. The ESS also identifies safety significant Specific Administrative Controls for fire protection and container management to reduce the likelihood of a container deflagration from anticipated to extremely unlikely. LANL concludes that temporary storage in this configuration is safe and have established a team of experts to develop a path forward for disposition of this material.

Plutonium Facility–Safety Basis: Last week, safety basis personnel concluded that the concern regarding hazards associated with cellulosic material (i.e., cheesecloth) contacted with nitric acid and plutonium-238 did not constitute a PISA (see 10/7/16 weekly). Their assessment relies on a white paper produced by the waste management group at the Plutonium Facility. The white paper largely focuses on nitrating cellulose in chemically simple systems, though it does acknowledge that ignitable or reactive material could be produced and recommends further testing. The safety basis assessment also points to two hazard scenarios in the approved safety basis that involve nitric acid and cheesecloth. The Site Representatives note that the white paper fails to consider the operational history of accidents involving cheesecloth and nitric acid at LANL, and more broadly in the nuclear industry, and also note that both hazard scenarios occur inside the building, whereas the extent-of-condition indicates there may be 174 waste containers of potential concern that may not all be indoors.

Inappropriately Remediated Nitrate Salts (RNS): Last week, LANL submitted to the NNSA Field Office for review and approval a Plan of Action (POA) for a Contractor Readiness Assessment (CRA) for the restart of the Waste Characterization, Reduction, and Repackaging Facility to safely treat the RNS waste currently stored in Area G. The CRA is planned to commence in early January 2017. LANL notes in the POA that the CRA will be followed by a Federal Readiness Assessment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 4, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 4, 2016

DNFSB Staff Activity: B.K. Caleca, M.W. Dunlevy, N.M. George, P.J. Migliorini, A.R. Powers, and C.P. Scheider were onsite to conduct an initial scoping review of the Plutonium Facility safety basis and for site familiarization. Activities included walkdowns of Technical Area-55, the Plutonium Facility, Area G, and the Chemistry and Metallurgy Research (CMR) Building, as well as holding discussions with LANL safety basis personnel. B.K. Caleca participated in a Plutonium Facility seismic discussion with NNSA and LANL personnel and observed seismic trenching activities in Technical Area-16.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF)–Operations: Last week, LANL submitted to the NNSA Field Office for review and approval a request to transfer a drum containing transuranic (TRU) waste from WCRRF, which is currently in COLD STANDBY, to CMR for temporary storage. Operations personnel created this waste drum when cleaning out the waste characterization glovebox that will be used in the treatment of the inappropriately remediated nitrate salts (RNS) currently stored in Area G. WCRRF personnel did not anticipate the possibility that this activity would generate TRU waste which is prohibited by the Technical Safety Requirements when the facility is in COLD STANDBY. Complicating this matter, WCRRF management notes that transition to WARM STANDBY cannot be achieved in a timely manner due to a lack of qualified operations personnel and the current operability status of facility equipment. In the request letter, LANL states that the presence of the drum is impacting the ability to conduct readiness activities necessary to startup the RNS treatment campaign.

Plutonium Facility Infrastructure: On Monday, the NNSA Administrator approved Critical Decision (CD)-2/3, *Performance Baseline and Start of Construction*, for the Radiological Laboratory Utility Office Building (RLUOB) Equipment Installation Phase 2 (REI-2) and Plutonium Facility Equipment Installation Phase 1 (PEI-1). These subprojects of the CMR Replacement project (see 12/18/15 weekly) are needed to move the remaining analytical chemistry and material characterization activities out of CMR. The CD-2/3 approval letter identifies the scope of the subprojects to include outfitting or repurposing 10,000 square feet of laboratory space in RLUOB and 2,800 square feet of space in the Plutonium Facility. Additionally, the letter indicates these projects are scheduled to receive approval for CD-4, *Start of Operations*, in early calendar year 2022.

Transuranic Waste Facility (TWF)–Safety Basis: On Wednesday, the NNSA Field Office convened a Senior Review Board (SRB) to evaluate the draft Safety Evaluation Report (SER) for approval of the TWF Documented Safety Analysis. The SRB was comprised of senior leaders from NNSA's Field Office and headquarters, including NNSA's Cognizant Secretarial Officer for Safety and Deputy Associate Administrator for Safety. In addition to reviewing the SER, the SRB heard a number of minority opinions from members of the Safety Basis Review Team. The SRB identified a number of issues the Safety Basis Review Team will have to resolve prior to SER approval.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 11, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 11, 2016

Weapons Engineering Tritium Facility (WETF)–Safety Basis: Last Thursday, WETF management declared a Potential Inadequacy of the Safety Analysis (PISA) when they determined that three Flanged Tritium Waste Containers stored within the facility are potentially pressurized with an explosive mixture of hydrogen isotopes and oxygen. WETF personnel recognized this potential issue following the declaration of a PISA for a similar situation with waste containers from WETF stored at Area G (see 9/9/16 weekly). WETF management has limited access to the portion of the facility containing these waste drums to ensure the facility is in a safe configuration while the Unreviewed Safety Question is being determined.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF)–Operations: On Tuesday, the NNSA Field Office approved LANL’s request to transfer a drum containing transuranic waste from WCRRF, while in COLD STANDBY, to the Chemistry and Metallurgy Research Building for temporary storage (see 11/4/16 weekly). On Wednesday, LANL personnel transferred the drum.

Also on Tuesday, the NNSA Field Office manager approved LANL’s Plan of Action for a Contractor Readiness Assessment for the restart of WCRRF to safely treat the inappropriately remediated nitrate salt (RNS) waste currently stored in Area G (see 10/28/16 weekly).

WCRRF and AREA G–Safety Basis: Last week, LANL issued final reports for Implementation Verification Reviews (IVR) of WCRRF and Area G safety basis changes needed for final treatment of the RNS waste. The IVR team noted that the conditions of approval (COA) and directed changes in the approving Safety Evaluation Report (see 10/14/16 weekly) have been implemented but cannot be finalized until approval of COA responses have been received from both the EM and NNSA Field Offices. The IVR team identified necessary administrative issues that must be resolved and concluded that once these changes are made the revised safety bases are adequately implemented.

Transuranic Waste Management: On Wednesday, personnel from the Sandia National Laboratories, NNSA Field Office, EM Headquarters, and LANL met to discuss the status and path forward for testing on pipe overpack containers (POC). LANL and NNSA senior management have become increasingly concerned regarding the safety basis uncertainty with POCs. Currently, the existing inventory of filled POCs at LANL is on the order of 600. Additionally, LANL management has accepted the risk of continuing to use POCs for packaging of combustible transuranic waste because of the reduction in waste container volume afforded by their use. The risk stems from the fact that the safety basis for the Waste Isolation Pilot Plant (WIPP) currently prohibits POCs with combustibles. As a result, either these POCs will need to be repackaged or EM and NNSA will need to complete adequate testing of POCs in fuel pool fire conditions—a credible accident at WIPP. This uncertainty has also prompted the NNSA Field Office into considering a prohibition of POCs in the new Transuranic Waste Storage facility, which had originally envisioned reliance on POCs to increase the material-at-risk. Overall, LANL personnel intend to review what capabilities they could apply to the testing program and the group agreed to reconvene in early December.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 18, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 18, 2016

DNFSB Activity: Board Member Santos was on site to observe the Board's staff review of LANL's software quality assurance (SQA) program discussed below. Board Member Santos walked down the high fidelity mockup of the Waste Characterization Reduction and Repackaging Facility (WCRRF) glovebox that LANL is using to prepare operators and procedures for the mixing and blending activities needed for inappropriately remediated nitrate salt (RNS) waste treatment. Mr. Santos also met with the NNSA Field Office Manager and Deputy Manager.

DNFSB Staff Activity: R.C. Eul was onsite and W.S. Horton called in remotely to conduct a review of LANL's SQA program. The team evaluated the program's compliance with DOE SQA directives as well as the implementation of the program through a sampling of safety software being used at LANL defense nuclear facilities.

Weapons Engineering Tritium Facility (WETF)–Safety Basis: On Thursday, WETF personnel determined that the Potential Inadequacy of the Safety Analysis declared for three flanged tritium waste containers (FTWCS) stored within WETF (see 11/11/16 weekly) represents a positive Unreviewed Safety Question. WETF safety basis personnel identified that the facility hazards analysis does not consider scenarios to evaluate the generation of flammable hydrogen-oxygen mixtures in tritium containment vessels. WETF management cite the robust construction of the FTWCS, the way the FTWCS were loaded, and the ability to prevent any ignition sources as justification for the current safe storage of these items. WETF safety basis personnel are now developing an Evaluation of the Safety of the Situation (ESS) to submit to the NNSA Field Office for review and approval.

WCRRF–Safety Basis: On Thursday, LANL submitted to the NNSA Field Office for review a notification and supporting documentation for closure of the ESS for the July 2015 WCRRF roof leak (see 7/17/15 weekly). LANL informed the NNSA Field Office that the repairs to the roof have been completed and the building structural integrity has been restored and declared operable.

Transuranic Waste Facility (TWF)–Safety Basis: This week, the NNSA Field Office reconvened the Senior Review Board (SRB) to evaluate a revised Safety Evaluation Report (SER) for the TWF safety basis (see 11/4/16 weekly). The SRB went line-by-line through the draft SER and heard minority opinions from the Safety Basis Review Team. The SRB continues to deliberate and are expected to make a presentation of their proposal for the path forward to NNSA's Cognizant Secretarial Officer for Safety next Monday.

Area G–RNS Waste: On Thursday, LANL submitted to the NNSA Field Office for review and approval a request to remove and replace a lid on one of the 55 gallon drums in Area G containing RNS waste that has stripped filter hole threads. LANL notes in the request that this will also require removal and replacement of the pressure relief device with supplemental filtration that is currently installed.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 25, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending November 25, 2016

Plutonium Facility–Infrastructure: Last month, the NNSA’s Office of Recapitalization approved the analysis of alternatives for phase III of the TA-55 Reinvestment Project (TRP III). The decision endorsed moving forward with a full fire alarm system replacement with the addition of a second alarm panel for the non-nuclear facilities. This action solidifies the fact that TRP III will not include an upgrade to a safety class active confinement ventilation system or support separation of the non-nuclear facilities from the firewater loop. Both of these sub-projects are identified in the TA-55 Project Execution Strategy as required to help further reduce the mitigated offsite consequences from seismically-induced events. Both sub-projects are also identified in the approved safety basis as planned improvements, as well as listed as compensatory measures associated with acknowledged vulnerabilities in the existing safety systems. The path forward for these sub-projects is currently unclear.

Earlier this month, LANL personnel hosted a multi-day deep dive focused on conveying the laboratory’s infrastructure needs for the NNSA Office of Safety, Infrastructure and Operations. With respect to the Plutonium Facility, the presentations highlight needs associated with the failing wet vacuum material handling system, several safety and compliance projects to ensure the operability of safety systems, ventilation and confinement system upgrades, fire wall repairs, firewater loop component replacements, vault rack upgrades, and revitalization of the trolley system. Many of these identified needs have an uncertain path forward.

Area G–Inappropriately Remediated Nitrate Salts (RNS): On Tuesday, the NNSA Cognizant Secretarial Officer unconditionally approved the safety evaluation report for revision 6.1 of the Evaluation of the Safety of the Situation (ESS) concerning the storage of the RNS wastes. This version includes some corrections to revision 6 (see 8/12/16 weekly) originally submitted on April 21, 2016, and primarily provides analysis and controls for the wildland fire scenario and installation of pressure relief devices on the remaining RNS contained in pipe overpacks.

The Site Representatives note that the lengthy development and approval cycle for revision 6.1 demonstrates the need for LANL to adjust their safety basis processes to ensure that safety controls identified as necessary during the development of an ESS are implemented as soon as they are determined to be necessary. In this case, revision 6.1 identified four new safety controls. In the absence of Area G management’s proactive intervention earlier this summer, the controls identified as needed would not have been implemented until the coming weeks—well past their intended use for prime wildfire season.

Transuranic Waste Facility (TWF)–Safety Basis: On Monday, NNSA personnel completed the last of several days of meetings for their Senior Review Board to reach their conclusions on the final safety basis for this new facility. The safety evaluation report is expected next week. This approval, as well as the revision 6.1 discussed above, is expected to free up NNSA Field Office safety basis personnel to address other pressing documents waiting on approval, including the revised attachments for RNS treatment (submitted 10/21/16), the ESS for Flanged Tritium Waste Containers (submitted 10/13/16), and the ESS for waste inventory discrepancies (submitted 5/13/16).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 2, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 2, 2016

DNFSB Staff Activity: On Wednesday, D.K. Andersen and B.K. Caleca participated in the fortnightly teleconference with LANL and NNSA regarding seismic analysis and testing for the Plutonium Facility. On Thursday, M.W. Dunlevy, P.J. Foster, P.J. Migliorini, and S. Sircar conducted a teleconference regarding atmospheric dispersion, including an emphasis on the application in the safety basis for Transuranic Waste Facility, with LANL and NNSA Field Office personnel.

Inappropriately Remediated Nitrate Salt (RNS) Waste Treatment–Startup Activities: On Tuesday, the management self-assessment (MSA) team conducted an in-brief for their review of readiness of the RNS waste processing campaign, including the restart of the Waste Characterization Reduction and Repackaging Facility (WCRRF). The MSA team will conduct document reviews, personnel interviews, facility walk-downs, and observe performance demonstrations and emergency response. The team will observe activities in Area G and WCRRF to include: denesting an RNS drum from its standard waste box; drum movements in the Dome 375 Permacon, refrigerator, and WCRRF; loading and unloading the designated transport vehicle; and process operations using surrogate material.

Area G–Safety Basis: On Wednesday, LANL transmitted to the NNSA Field Office for approval, a request for Area G to receive and store waste drums related to RNS treatment activities. LANL requires this approval because of the material-at-risk restrictions that are currently implemented by the Evaluation of the Safety of the Situation for material-at-risk discrepancies. LANL identified the following waste as candidates for this request: (1) transuranic and/or low level waste generated from cleanout of the WCRRF glovebox prior to processing RNS waste; (2) low level waste containers currently staged in the WCRRF transportainers; (3) the transuranic waste drum currently stored in the Chemistry and Metallurgy Research (CMR) building that originated from WCRRF (see 11/4/16 weekly); and (4) any drums identified in (1) or (2) that may be sent to CMR for temporary storage while the request is pending approval.

RANT Shipping Facility: On Tuesday, sub-contractors commenced geotechnical investigation activities needed to inform the design for the seismic structural upgrade. LANL currently anticipates completion of the design in March 2017.

Contractor Assurance System: Last week, the LANL Director signed and transmitted the annual contractor assurance letter to the NNSA Field Office and LANS LLC Board of Governors. The letter documents LANL's verification that the CAS is compliant with contractual requirements and laboratory policies. The letter notes continued progress against the multi-year Performance Assurance Improvement Plan with this year's focus on strengthening the issues management process. Other notable achievements include: re-establishing the Institution Management Review Board; revision of the CAS description document; completion of four Facility Evaluations; a re-boot of the causal analyst program; and newly developed institutional metrics linked to the LANL Director's critical issues list.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 9, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 9, 2016

DNFSB Staff Activity: On Wednesday, staff members T.J. Dwyer, M.W. Dunlevy, and P.J. Migliorini met with NNSA and LANL personnel at DNFSB Headquarters to discuss progress made with respect to DNFSB/Tech 39, *Opportunities for Risk Reduction at the LANL Plutonium Facility through the Minimization of Material-at-Risk*.

Transuranic Waste Facility (TWF) Project: On Tuesday, the NNSA Field Office Manager approved the final safety basis for the project. The approval included directed changes to: (1) temporarily reduce the material-at-risk limit by 15 % and (2) revise the basis for a technical safety requirement associated with drum banding. Additionally, the approval included conditions to: (1) submit a revised safety basis that classifies the fire suppression system as safety significant, including the minimum necessary and sufficient support systems (directed change #1 would then expire) and (2) prohibit the receipt of pipe overpack containers (POC) until the safety basis is re-evaluated to consider the results of the ongoing fire testing (see 11/11/16 weekly). Notably, several of the safety basis review team members did not recommend approval. Furthermore, the NNSA Cognizant Secretarial Officer, who concurred on the documents, also placed a condition of approval to require full implementation of the safety significant fire suppression no later than February 28, 2018.

LANL anticipates the start of operations in late spring 2017. The Site Representatives note that the current prohibition of POCs and limitations contained in the permit from the New Mexico Environment Department mean that TWF can only receive about 100 of approximately 700 waste containers currently stored at the Plutonium Facility. Moreover, NNSA management has accepted the programmatic and safety risks of continuing to pack combustible waste in POCs with the expectation that fire testing will eventually support the acceptance of these packages into the Waste Isolation Pilot Plant.

Plutonium Infrastructure Strategy: On Monday, the LANL Director sent the NNSA Administrator a letter outlining a potential slip in the commitment to cease programmatic operations in the Chemistry and Metallurgy Research (CMR) building from 2019 to 2021. LANL cites the source of the schedule risk as funding alignment issues and the delay in the CD-2/3 approval and with the equipment installation subprojects (see 11/4/16 weekly). Notwithstanding this potential delay, the Director noted past and continued risk reduction activities at CMR.

Emergency Management: On Monday, the NNSA Field Office Manager approved LANL's revised after action report for the full-scale exercise (see 10/28/16 weekly). The approval letter included seven observations, the most significant of which included the failure to establish an effective incident command and to ensure responding personnel were not in the radioactive plume without proper protective equipment.

Waste Characterization Reduction and Repackaging Facility (WCRRF)–Emergency Management: On Wednesday, WCRRF personnel conducted their annual emergency exercise. This year's scenario involved a thermal runaway of an inappropriately remediated nitrate salt waste drum and an unconscious worker who sustained injuries while trying to move away from the drum. Of significance, emergency responders were slow to respond to the injured individual who remained unconscious in the radioactive plume and cold weather for more than an hour and a half.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 16, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 16, 2016

DNFSB Staff Activity: J.W. Plaue conducted oversight activities at the Lawrence Livermore National Laboratory. On Wednesday, B.K. Caleca, M.W. Dunlevy, and T.J. Dwyer participated in the monthly video teleconference with NNSA and LANL contractor personnel to discuss details of planned seismic analyses and testing for the Plutonium Facility. On Thursday, a staff team conducted a teleconference with NNSA, EM, and LANL personnel to discuss staff questions regarding the hazards associated with the cheesecloth used to clean up a spill of plutonium-238 in a nitric acid solution (see 10/28/16 weekly).

Radioactive Liquid Waste Treatment Facility–Emergency Management: Earlier this month, LANL issued the after action report for the annual exercise held on October 26, 2016. This year's scenario involved the simulated spill of 200 gallons of sodium hydroxide during a transfer from a delivery truck that splashed and chemically burned the involved worker. The report notes that 42 of 45 objectives were met with the remainder not applicable. Seven opportunities for improvement were identified, including the following of note: (1) a recommendation to use a real tanker truck, since the simulation of the presence of a tanker truck and associated spill confused some players and complicated injects; (2) an employee who was monitoring the transfer was not assisted or evacuated from the 25 meter isolation zone and the facility procedures were not specific enough to clarify the correct action for this situation; (3) only one person in the facility command knew how to use the video monitor system; and (4) communication challenges existed between two operations centers, facility command, and incident command all in geographically distinct locations.

Safety Basis–Flanged Tritium Waste Containers (FTWC): LANL management recently stood up an integrated project team to develop a path forward to disposition all 12 of the FTWCs currently stored at Area G and the Weapons Engineering Tritium Facility. Calculations indicate that eight of these containers may be pressurized with a potentially explosive headspace mixture of oxygen and hydrogen isotopes. The team is in the early stages of options analysis and is considering such decisions as in-situ versus alternate locations for processing; mechanical versus dynamic approaches to relieving the pressure; and disposal at Area G or offsite facilities. In parallel, they are also investigating the feasibility from a regulatory perspective of direct disposal for some of the containers. The team has set mid-summer 2017 as their target for completion to avoid the additional complications once the new contractor takes over Area G in October 2017.

Inappropriately Remediated Nitrate Salt (RNS) Waste Treatment–Startup Activities: On Wednesday, the Management Self-Assessment team briefed the results of their review of readiness for the RNS waste processing campaign (see 10/28/16 weekly), including the restart of the Waste Characterization Reduction and Repackaging Facility (WCRRF). The team identified eighteen pre-start findings relating to WCRRF restart, the most significant of which related to emergency management, conduct of engineering, and conduct of training. Facility management intends to resolve these pre-start findings in time to support a Contractor Readiness Assessment currently scheduled for January 2017.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 22, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 23, 2016

Weapons Engineering Tritium Facility (WETF)–Flanged Tritium Waste Containers (FTWC): Last Friday, LANL submitted to the NNSA Field Office for review and approval an Evaluation of the Safety of the Situation (ESS) for the Potential Inadequacy of the Safety Analysis declared for three FTWCs stored within WETF that may be pressurized with a potentially explosive headspace mixture of oxygen and hydrogen isotopes (see 11/17/16 weekly). The ESS concludes that the current situation is safe based upon the immediate actions taken to provide increased management oversight, strict operational control over the area containing the FTWCs, and a prohibition on moving or venting the FTWCs. WETF safety basis personnel contend in the ESS that with these controls in place it is extremely unlikely that any electrical, mechanical, or thermal ignition source could ignite the potentially explosive mixture.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Safety Basis: Last week, the EM Field Office transmitted to LANL a letter approving four proposed changes to the Area G and Waste Characterization Reduction and Repackaging Facility (WCRRF) safety bases as well as LANL’s Transportation Safety Document. LANL submitted these changes to meet the Conditions of Approval identified in the Safety Evaluation Report approving the safety basis documents needed to support final treatment of the RNS waste into an acceptable waste form (see 10/14/16 weekly).

Area G–RNS: Last week, the Area G facility operations director declared revision 6.1 of the ESS for safe storage of RNS waste implemented (see 11/25/16 weekly). Following this declaration, operators completed lid removal from the remaining standard waste boxes containing RNS waste in pipe overpack containers and installed pressure relief devices with supplemental filtration onto the 55 gallon drums housing the pipe components. This action represents the final activity necessary to implement all of the controls specified in the ESS.

Plutonium Facility–Safety Basis: On Monday, LANL submitted to the NNSA Field Office a request to further extend the ESS/Justification for Continued Operations (JCO) governing nuclear criticality safety for two rooms in the facility vault (see 6/24/16 weekly). LANL originally submitted this ESS/JCO in December 2012, but limited criticality safety resources and prioritization of these resources on Plutonium Facility resumption activities has resulted in delays in completing and receiving approval of the criticality safety evaluations needed to close this ESS/JCO.

Plutonium Facility–Readiness Activities: On Wednesday, a management self-assessment (MSA) team conducted an in-brief for their upcoming review of aqueous chloride processing in the Plutonium Facility. The MSA for aqueous chloride operations is the first readiness activity scheduled to be performed following the completion of the formal restart project of Plutonium Facility operations accomplished earlier this year (see 9/9/16 weekly). The MSA team will conduct their review in two phases. Phase 1 will focus on document reviews and will commence January 9, 2017. Phase 2 will involve field activities and is scheduled to begin on January 19, 2017.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 30, 2016

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 30, 2016

The Year on a Page: The Site Representatives' summary of the key developments of 2016:

- LANL completed key actions necessary to minimize the risk associated with the inappropriately remediated nitrate salt wastes (RNS). The most prominent of these actions include: implementation of new controls identified in the Evaluation of the Safety of the Situation (ESS) to prevent or mitigate consequences from a wildland fire and thermal runaway event; completion of the safety basis changes necessary to support the final treatment of the RNS wastes into an acceptable waste form; and preparation for upcoming readiness reviews to conduct final treatment activities. LANL managers believe they remain on schedule to complete the treatment prior to the next peak wildland fire season.
- Transuranic waste operations at Area G remain largely curtailed pending resolution of eight Potential Inadequacies of the Safety Analysis (PISA). Resolution of several of these PISAs has languished for many months due to competing priorities for LANL and NNSA Field Office safety basis personnel.
- Plutonium Facility personnel completed the revised scope of the restart project. Notably, several process deviations occurred in resumed operations prompting management to significantly change the material move procedure. The next significant readiness review is scheduled to occur in April 2017 for the aqueous chloride and americium oxide operations.
- Plutonium Facility personnel accomplished significant progress addressing DNFSB/Tech-39 concerns, including reducing material-at-risk on the first floor located outside of gloveboxes by 127 kg by relocation to more robust storage locations and improved utilization of certified containers.
- NNSA's decisions on the scope for Phase III of the TA-55 Reinvestment Project translated into the loss of line item funding for Plutonium Facility to upgrade the active confinement ventilation system to safety class and eliminate non-seismically qualified loads from the safety class fire water loop. These sub-projects were key elements of NNSA's previous strategy to mitigate the consequences of a post seismic fire to well below the DOE Evaluation Guideline. The situation is further exacerbated by the recently acknowledged seismic fragility issues with the fire suppression system, as well as LANL's planned reliance on executing these line items to counter system aging, vulnerability, and obsolescence issues.
- The Plutonium Infrastructure Strategy moved forward with approval of Critical Decision 2/3 for the equipment installation sub-projects and conduct of the analysis of alternatives for the Plutonium Modules. Notwithstanding this progress, delays and resource issues with the subproject approval will likely prolong programmatic operations in the Chemistry and Metallurgy Research Building.
- LANL declared PISAs associated with the potential for explosive mixture of oxygen and hydrogen isotopes in the headspace of Flanged Tritium Waste Containers. In the coming months, the NNSA Field Office is expected to complete review and approval of the ESSs for this condition and LANL is expected to develop a process and associated safety basis to disposition these containers.
- Weapons Engineering Tritium Facility personnel completed programmatic function tests for the first time since July 2011. They have also nearly completed a maintenance outage to make system modifications and resolve pressure safety concerns. The modifications are necessary to support risk reduction activities associated with the removal of bulk tritium gas.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 6, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 6, 2017

Plutonium Facility Infrastructure: Last month, LANL management transmitted to the NNSA Field Office for information the fiscal year 2017 TA-55 Project Execution Strategy (PES). Planned work for this year includes: a number of continued seismic structural activities; completion of walk-downs for the firewater pump houses; completion of the preliminary evaluation of the cast iron fittings issue for the fire suppression system; installation of concrete pads for a future diesel generator to support the electric firewater pumps; continuation of the development of an execution strategy for glovebox fire suppression systems; and identification of equipment and components needed to support a potential Performance Category 3 ventilation system. Notable out-year activities include: determination of a path forward to remediate seismic interaction issues (2 over 1), particularly with the fire suppression system; completion of seismic evaluations for safety significant systems, structures, and components in order to complete the project to identify the totality of seismic vulnerabilities that began in 2008; modifications to achieve 2-hour fire barrier status for certain walls; removal of non-seismic loads from the safety class firewater loop; and an active confinement ventilation system.

Confinement Vessel Disposition (CVD) Project: CVD project personnel continue with cleanout operations of the fifth sphere, despite the recent loss of several operators. The fifth sphere contains substantially more debris than prior spheres with more than 40 drums worth removed to-date.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Emergency Management: On Thursday, the NNSA Field Office Manager approved an addendum to LANL’s Emergency Planning Hazards Assessment (EPA) for RNS waste storage and treatment. The addendum supplements the existing EPAs for Area G, the Waste Characterization, Reduction, and Repackaging Facility, and onsite transportation. LANL submitted the addendum to update the EPAs to be consistent with the safety basis changes made for RNS treatment and to address the identified increase in hazard presented by the RNS following the February 2014 drum breach at the Waste Isolation Pilot Plant.

Federal Oversight–2016 Performance Evaluation Report: On Tuesday, NNSA posted its 2016 Performance Evaluation Report for LANL. In the Operations and Infrastructure goal, NNSA acknowledged that LANL exceeded expectations for operational resumption activities at the Weapons Engineering Tritium Facility and the Plutonium Facility. NNSA identified a number of areas under this goal where LANL did not meet expectations that included: (1) necessary improvements to the criticality safety program are not proceeding at an acceptable pace; (2) although improving, the contractor assurance system continues to have significant deficiencies, and (3) weaknesses in the emergency management program continue to be identified by both internal and external reviews.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 13, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 13, 2017

DNFSB Staff Activity: Z.S. Beauvais, C. Berg, and J.D. Anderson were on site to attend the kick-off meeting for the W76 Nuclear Explosives Safety Study. They also conducted walk-downs of the Plutonium Facility and Weapons Engineering Tritium Facility, and observed an emergency drill at the Waste Characterization, Reduction, and Repackaging Facility (WCRRF).

Inappropriately Remediated Nitrate Salt (RNS) Waste–Emergency Management: LANL management has taken action to strengthen emergency management following a less than adequate performance during an emergency exercise that resulted in a pre-start finding from the management self-assessment for WCRRF readiness (see 12/9/16 weekly). For example, this week WCRRF personnel conducted three type 2 (instructional) emergency drills involving limited participation from the Los Alamos Fire Department and the LANL Emergency Operations organization. They plan to conduct additional operational and emergency drills, including a type 3 (evaluated) drill next week to assess the adequacy of preparations to commence the contract readiness assessment, currently scheduled for January 30, 2017. Additional actions include detailing several emergency management specialists to help prepare the facilities for the RNS treatment campaign and beginning to introduce the concept of “critical steps” into the drill evaluation objectives.

WCRRF Operations: On Tuesday, WCRRF personnel took the facility into WARM Standby mode for the first time in nearly three years. This action allowed operations personnel to complete cleanout of the waste characterization glovebox, removal and shipment of the associated transuranic waste, and installation of the equipment needed for the RNS treatment campaign.

Federal Oversight: On Monday, the NNSA Field Office issued a revision to its Differing Professional Opinion procedure. The Field Office issued this revision as a corrective action for the Organizational Health Assessment conducted earlier this year (see 9/2/16 weekly).

On Tuesday, the staff of the Chief of Defense Nuclear Safety commenced its review of the NNSA Field Office. The review is expected to run through March 2017 and will include review of 14 functional areas including, criticality safety, safety culture, emergency management, issues management, readiness, and oversight processes.

Transuranic Waste Facility (TWF) Project: On Monday, LANL management transmitted to the NNSA Field Office for information the TWF safety basis implementation plan. The scope of the plan includes all safety controls with the exception of those associated with the deferred project scope involving the waste characterization trailers. A formal schedule for completing the trailer scope is not yet available, but the trailers are needed to certify the waste for offsite disposition and current regulatory permit requirements dictate that waste containers can reside at TWF for no more than one year. The implementation plan states completion in March 2017.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 20, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 20, 2017

Plutonium Facility–Safety Basis: On Tuesday, LANL safety basis personnel opened a New Information (NI) screening regarding the use of cellulosic wipes (i.e., cheesecloth) in aqueous process operations. A similar NI was closed in late October (see 10/28/16 weekly). Developments since that time include the issuance of a memorandum stating that the white paper referenced in the NI closure documentation represented the issuing body’s philosophy and as such, formal resolution of peer review comments was not performed. Additionally, as briefed to the NNSA Field Office on Wednesday, LANL management recognized that the previous NI contained information from the approved safety basis that did not reflect current operational practices. Specifically, the safety basis states that cheesecloth used in aqueous processing operations for plutonium-238 would be rinsed and pyrolyzed in preparation for waste disposal. In reality, the pyrolysis unit operated briefly in the 2007 timeframe, but was suspended after disposition issues arose with the resulting homogenous waste form (see 9/21/07 weekly) and a simplified direct-discard process became viable. Similarly, the instruction to operations personnel to rinse cheesecloth had been removed from the applicable procedures.

LANL management indicated they were pursuing several actions to complete the NI processing including additional testing, calculations, and regulatory permit research. Per LANL’s procedure, they have 15 calendar days to complete processing of the NI to determine whether a Potential Inadequacy of the Safety Analysis exists; however, the procedure allows for additional time without NNSA Field Office approval.

Plutonium Facility–Emergency Management: On Wednesday, Plutonium Facility personnel conducted their annual emergency exercise. This year’s scenario involved a postulated spill of nitric acid from a delivery vehicle whose driver had a stroke. Determination that the spill from the truck was limited to about 50 gallons, allowed responders to significantly reduce the isolation zone from the bounding distance of 764 meters facilitating a simpler response.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Emergency Management: On Thursday, RNS treatment personnel conducted a type 3 (evaluated) drill at the Waste Characterization Reduction and Repackaging Facility. The scenario involved a thermal runaway of an RNS drum inside the facility with an injured worker in need of extraction. RNS, LANL Emergency Managers, and Los Alamos Fire Department personnel have recently spent considerable effort touring the facility, planning responses, integrating the new video monitoring capability, and training consistent terminology. These efforts resulted in a response that was improved from the performance during the recent annual exercise (see 12/9/16 weekly).

Weapons Engineering Tritium Facility (WETF)–Safety Basis: On Friday, LANL submitted to the NNSA Field Office for validation a revision of the WETF Technical Safety Requirements (TSR). LANL submitted the change to address three directed actions the NNSA Field Office Manager provided in a letter approving the initial TSR submission. The directed actions included: (1) revise the Specific Administrative Control (SAC) for containerization, (2) provide page changes to the TSRs reflecting the SAC revision to the NNSA Field Office for validation, and (3) incorporate changes from a previously approved version of the safety basis into the 2017 annual update.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 27, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending January 27, 2017

Area G–Safety Basis: Last Friday, LANL submitted to the NNSA Field Office for review and approval a safety basis strategy and implementation plan for resolution of three outstanding Potential Inadequacies of the Safety Analysis for material-at-risk (MAR) inventory discrepancies in Area G (see 5/20/16 weekly). LANL’s strategy includes the need for the NNSA Field Office to approve the related Evaluation of the Safety of the Situation (ESS) submitted in May 2016. Following approval, Area G operators will implement stricter MAR limits and will relocate approximately 500 waste containers to meet array spacing requirements for the aircraft crash analysis for all of Area G. LANL indicates that a revised safety basis incorporating the ESS will be submitted in April 2017 to fully resolve the issues.

On Thursday, the NNSA Field Office Manager approved LANL’s request for Area G to receive and store waste drums related to inappropriately remediated nitrate salt (RNS) waste treatment activities (see 12/2/16 weekly). In the approval letter, the NNSA Field Office Manager notes that care was taken to ensure this effort does not conflict with the pending safety basis approvals for MAR discrepancy issues discussed above.

Unremediated Nitrate Salt (UNS) Waste–Safety Basis Strategy: Also last Friday, LANL submitted to the NNSA Field Office for review and approval a treatment plan and safety basis strategy for the 29 UNS waste containers currently stored in Area G. LANL’s proposed treatment activities include non-destructive assay and physical inspection of the UNS containers in Area G, transport from Area G to the Waste Characterization, Reduction, and Repackaging Facility (WCRRF), and final treatment at WCRRF to eliminate the waste’s ignitability characteristics. LANL’s proposed safety basis strategy includes the need to conduct a process hazard analysis on the activities in Area G to determine if safety basis changes will be necessary, and the submittal of a temporary modification to the WCRRF safety basis to support treatment activities. The safety basis strategy indicates that all necessary safety basis changes will be submitted to the NNSA Field Office for review and approval by April 2017. Of note, LANL’s submittal indicates that discussions with the NNSA and EM Field Offices concluded treatment of RNS and UNS wastes remain the top risk reduction priorities at Area G and WCRRF.

Emergency Management–Federal Oversight: On Monday, the NNSA Field Office published a fiscal year 2016 self-assessment of its emergency management program. The assessment was performed by the NNSA Field Office emergency management program manager and included the following subjects in its scope: (1) hazards surveys and hazards assessments, (2) program administration, (3) training, drills and exercises, (4) readiness assurance, (5) emergency response, and (6) offsite interfaces. The assessment report identifies three findings including: (1) oversight of the wildland fire management plan is inadequate, (2) the NNSA Field Office is not approving and submitting hazards surveys, emergency planning hazards analyses, nor emergency planning zones in a timely manner, and (3) mutual aid agreements between the NNSA Field Office and tribal authorities pertaining to emergency response do not exist. The emergency management program manager has entered the identified findings and observations in the NNSA Field Office issues management system for resolution.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 3, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 3, 2017

DNFSB Staff Activity: On Thursday, a staff team lead by R.C. Eul provided to LANL and NNSA Field Office personnel their closeout observations regarding their review of software quality assurance.

Federal Oversight: On Thursday, the NNSA Field Office Manager announced several staff rotations intended to improve organizational health. Additional forthcoming actions include commencing daily standup meetings for the operations group and developing a joint prioritization matrix for safety basis actions.

Plutonium Facility–Safety Basis: On Thursday, Plutonium Facility management declared a Potential Inadequacy of the Safety Analysis (PISA) for the use of cellulosic wipes (i.e., cheesecloth) in contact with heat source plutonium (HS-Pu). This determination closes out the New Information screening initiated last month (see 1/20/17 weekly). Management’s rationale for declaring the PISA stems from preliminary analysis that indicates a bounding threshold of around 200 °C for initiating combustion of cheesecloth that has come in contact with nitric acid. Additional conservative thermal modeling indicates that quantities of HS-Pu in excess of 10 g and in certain packaging configurations has the potential to challenge the 200 °C threshold. Their preliminary review of the waste inventory revealed five pipe overpack containers impacted by this information—one of these containers is located on the outdoor waste storage pad. Management’s initial compensatory actions include: (1) conducting the in-service inspection on the outdoor container to ensure no indications of a prior thermal event with emphasis on the state of the filter, (2) returning the outdoor container to the Plutonium Facility confinement structure, (3) issuing a prohibition on waste containers with greater than 10 g HS-Pu and cheesecloth, and (4) providing this information to management at Area G and the Waste Isolation Pilot Plant for their consideration.

Weapons Engineering Tritium Facility (WETF)–Readiness: On Monday, the NNSA Field Office Manager approved LANL management’s request to revise the level of readiness review required to load, package, and ship hydride transport vessels (HTV). Previously, the NNSA Field Office had approved a proposal to conduct a Federal Readiness Assessment (RA) to startup these operations. In the revised request, LANL proposed to forego the Federal RA and to initiate HTV operations under a revised and more rigorous startup plan that will extend management oversight. LANL’s request notes that WETF personnel successfully completed a Federal RA in October 2015 that evaluated gas transfer operations similar to those needed to load, package, and ship the HTVs. Of note, startup of HTV operations will enable WETF personnel to process and ship bulk tritium gas from the facility that represents a large fraction of the material-at-risk and has no programmatic use.

Waste Characterization Reduction and Repackaging Facility–Readiness Activities: Last Friday, the Associate Director for Nuclear and High Hazard Operations approved a request to proceed with the Contractor RA for processing of waste drums containing the inappropriately remediated nitrate salt waste currently stored in Area G. On Monday, the Contractor RA team held their in-brief and commenced their review which is scheduled to conclude next week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 10, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 10, 2017

DNFSB Staff Activity: P.J. Migliorini and M.W. Dunlevy were on site this week augmenting the site representative office. Their activities including walking down the safety systems and waste storage areas at the Plutonium Facility and observing the drill at the Waste Characterization, Reduction, and Repackaging Facility (WCRRF) for the Contractor Readiness Assessment (CRA) discussed below.

Plutonium Facility–Infrastructure: Last Wednesday, during conduct of a weekly Surveillance Requirement, operators observed the diesel firewater pump fail to come up to speed after starting. Facility operations personnel had entered the appropriate Limiting Condition for Operations prior to commencing the surveillance, which allows 14 days to restore the pump to service prior to having to change the facility operations to Mode 2–Standby. Maintenance personnel identified the cause of the failure to be bad bearings on the auxiliary drive that powers the fuel injector and water pumps. Facility personnel received the necessary parts and expect to complete repairs before the 14 days have expired. This is the same diesel firewater pump that operators repaired and returned to service after experiencing a series of mechanical issues last year (see 9/23/16 weekly). On a related note, on Wednesday construction workers placed concrete for one of the pads to be used for the future installation of a diesel power generator. Facility personnel plan to install a diesel power generator at each pump house in order to provide an additional power supply to the electric firewater pumps.

Area G–Safety Basis: Last Friday, Area G management entered the New Information process regarding the potential fire hazard of cellulose waste material containing greater than 10 g of plutonium-238. This action was taken in response to the Potential Inadequacy of the Safety Analysis declared at the Plutonium Facility (see 2/3/17 weekly). LANL’s review of the inventory indicates that there are currently three 55-gallon drums stored at Area G with records indicating the presence of cheesecloth and greater than 10 g of plutonium-238. All three of these drums are overpacked in Standard Waste Boxes.

WCRRF–Readiness Activities: On Friday, the CRA team out-briefed the results of their review of the personnel, equipment, and procedures needed to process the waste drums containing the inappropriately remediated nitrate salt waste. The CRA team identified five pre-starts and no post-start findings. The pre-starts dealt with the need to strengthen the startup plan, improve field validation of operating procedures, resolve two training issues, and deploy the production version of the Waste Characterization and Tracking System database.

WCRRF–Emergency Management: On Tuesday, WCRRF personnel conducted an emergency drill for the CRA team. Drill participation included personnel from the LANL Emergency Management, the LANL Hazardous Materials Team, and the Los Alamos Fire Department. The scenario involved a thermal runaway of an inappropriately remediated nitrate salt waste drum with a worker experiencing a concurrent incapacitating medical condition. The scenario was similar to drills conducted last month (see 1/12/17 weekly). Players and controllers identified several areas for improvement, particularly with respect to contamination control and drill conduct. Fire department personnel noted a significantly improved ability to respond and make timely rescue entry after receiving additional radiation safety information to supplement their pre-incident plans from facility personnel. Area G and Transuranic Waste Facility personnel are in the process of developing similar supplemental information for their facilities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 17, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 17, 2017

Transuranic Waste Management: Earlier this month, LANL issued the 2017 update to their *Enduring Mission Waste Management Plan* (see 2/26/16 weekly). The plan indicates that LANL expects to be prepared to resume shipments to the Waste Isolation Pilot Plant by September 2017. Accomplishment of this goal will require LANL personnel to complete several waste compliance reviews, as well as complete the formal readiness review process for the startup of a new nuclear operation to support the loading and shipping function. Given the status of necessary structural repairs and a required rewrite of the safety basis for the RANT Shipping Facility, shipping activities will likely need to utilize mobile loading units at either Area G or the Technical Area 55 yard.

Area G–Safety Basis: On Friday, the NNSA Field Office approved the safety basis annual update submitted last August. The update, which took the form of a letter, fulfills the regulatory requirement for an annual update contained in 10 CFR 830. However, the update does not resolve the multiple Potential Inadequacies of the Safety Analysis that have been open for many months.

Nuclear Criticality Safety: In addition to the Department of Energy’s annual report on nuclear criticality safety metrics submitted to the Board on February 1, 2017, LANL produces its own program performance metrics. LANL’s most recent report, for the period through the end of January 2017, ranked the program as “Needs Improvement,” which is defined as on a positive trajectory but only improving minimally through time towards a stable and compliant status. The report notes that no new infractions occurred in January and that the Institutional Nuclear Criticality Safety Committee completed four field observations. It also highlights concerns with procedures and postings created by the program operations staff requiring rework, as well as noting that although deemed to be safe by NNSA, three quarters of the open infractions have existed without resolution for longer than a year. The report notes total permanent analyst staffing at 19 with 10 fully qualified, including one senior qualified. These staffing levels remain well short of the need—a recent management self-assessment team identified the need for an additional 17 personnel to meet routine mission requirements.

Plutonium Facility–Infrastructure: On Tuesday, Plutonium Facility personnel entered Mode 2–Standby when maintenance personnel were unable to repair the diesel firewater pump within the applicable Technical Safety Requirement Limiting Condition for Operation completion time (see 2/10/17 weekly). On Thursday, facility personnel successfully completed repairs and post maintenance testing of the pump and returned the facility to Mode 1–Operations.

Transuranic Liquid Waste (TLW) Treatment Facility Project–Safety Basis: On Thursday, LANL submitted to the NNSA Field Office for review and approval, the Preliminary Documented Safety Analysis (PDSA) for the TLW Treatment Facility. The TLW Treatment Facility is a Hazard Category 3 facility that will replace the portion of the existing Radioactive Liquid Waste Treatment Facility dedicated to TLW treatment. The submittal letter notes that all directed actions from the Preliminary Safety Validation Report, as well as the NNSA Field Office comments on the 80% PDSA have been addressed. Further, the submittal notes that the NNSA Field Office and LANL have agreed that the PDSA is subject to a 60 working day Safety Evaluation Report approval cycle.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 24, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending February 24, 2017

Area G–Safety Basis: Last Thursday, Area G management declared a Potential Inadequacy of the Safety Analysis (PISA) concerning a weakness in the waste acceptance criteria for transuranic waste containing greater than 10 g of plutonium-238 and cellulosic wipes originating from the aqueous scrap recovery line in the Plutonium Facility. This action stemmed from the extent of condition review following the declaration of a similar PISA at the Plutonium Facility (see 2/3/17 weekly). At the fact finding, Area G personnel explained their logic that the existing safety basis adequately covered the three impacted containers currently stored at the facility and that no additional controls are necessary. However, they noted that the waste acceptance criteria would not have prevented receipt of containers that could have exceeded certain safety basis assumptions and therefore determined a need to place an additional restriction in the criteria. Interestingly, the onsite transportation safety basis already restricts transport of packages containing greater than 10 g of plutonium-238—the affected containers at Area G were the subject of a previous violation of the Technical Safety Requirements. There are also a number of additional containers in excess of this limit currently stored at the Plutonium Facility that may require remediation prior to onsite shipping.

Plutonium Facility–Safety Basis: Last Friday, the NNSA Field Office Manager approved the 2016 safety basis annual update letter submitted in May 2016. Notably, the NNSA Field Office Manager directed the LANL contractor to develop a plan to resolve all outstanding conditions of approval, directed changes, directed actions, and safety basis comments. The objective of this plan is to capture resolution of these items into a consolidated safety basis by August 3, 2017.

Chemistry and Metallurgy Research Building–Safety Basis: On Wednesday, the NNSA Field Office Manager unconditionally approved the Evaluation of the Safety of the Situation (ESS) for the PISA concerning nuclear material holdup quantities that may exceed the values assumed in the safety basis (see 10/7/16 weekly).

Area G–Safety Basis: Last Friday, the NNSA Field Office Manager approved the ESS for the flanged tritium waste containers (FTWCs) stored in Area G that may be pressurized with a potentially explosive headspace mixture of oxygen and hydrogen isotopes (see 10/28/2016 weekly). In the approval letter, the NNSA Field Office Manager concludes the FTWCs are currently in a safe configuration and requests LANL submit the final disposition plan and schedule for approval by the end of April.

Plutonium Facility–Readiness Activities: Last Friday, the management self-assessment team issued the report from their review of aqueous chloride processing and americium production capability in the Plutonium Facility (see 12/23/2016 weekly). The team determined that thirteen of the fourteen core requirements were met—the criticality safety core requirement was judged as not met. The team concluded that subject to closure of the 5 identified pre-start findings, Plutonium Facility personnel have adequately demonstrated readiness to move on to the Contractor Readiness Assessment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 3, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 3, 2017

Area G–Readiness Activities: On Tuesday, a Contractor Readiness Assessment (CRA) team completed their review of the Area G portion of the inappropriately remediated nitrate salt (RNS) waste processing campaign. The scope of the CRA included de-nesting the RNS waste drums from their standard waste boxes, transporting the drums to the refrigeration unit attached to the Dome 375 Permacon, and loading the drums onto a vehicle for transport to the Waste Characterization, Reduction and Repackaging Facility. During their outbrief, the team identified seven pre-start findings in the areas of radiological controls, hoisting and rigging, procedures, confined space entry, and engineering documentation. The team concluded that upon successful resolution of these pre-start issues, Area G personnel were ready to commence RNS operations.

Plutonium Facility–Infrastructure: On Wednesday, LANL personnel briefed the NNSA Field Office on the status of the Potential Inadequacy of the Safety Analysis declared for the seismic performance of cast iron and malleable iron fittings in the fire suppression system (see 4/22/16 weekly). Plutonium Facility personnel informed the field office that the sub-contractor has completed the necessary testing, modeling, and calculations and results indicate that the fire suppression system meets seismic performance category level 2, as currently specified in the safety basis. Facility personnel also indicated that in order to improve the fire suppression system's performance to safety class for seismic events as previously planned, additional modeling and analysis would have to be performed to identify necessary upgrades to meet performance category level 3.

Plutonium Facility–Conduct of Operations and Nuclear Criticality Safety: On Wednesday, a division leader conducting a walk-around identified an issue with two containers that exceeded the location's aggregate limit for soluble plutonium compounds. The limit is a temporary provision included in the safety basis stemming from the Evaluation of the Safety of the Situation associated with firewater ingress into gloveboxes. The specific limit requires operators to use approved water resistant containers for aggregate quantities in excess of 500 g of plutonium metal turnings, plutonium metal fines, plutonium metal pieces weighing less than 5 g, compounds, or dry residues. In this case, the operators incorrectly interpreted the requirement and believed they were in compliance since they had split the material—which was the dried residue of a dissolution run that had been dormant for more than 3 years—into two containers each with less than 500 g. As part of the response to the process deviation, facility management directed the over-packing of one of the items into a water resistant container. Two of the corrective actions discussed at the fact-finding involve reviewing the language of the limit for operator friendliness and emphasizing the limit in upcoming continuing training.

We note this event underscores the need to establish gloveboxes with compliant nuclear criticality safety limits that allow work with greater than 500 g of compounds. In particular, the facility has nearly 1500 items totaling about 365 kg of nuclear material that is impacted by this limit. Much of this material is categorized as No Defined Use and will require some amount of handling prior to disposition. Currently, development of an appropriate nuclear criticality safety evaluation is scheduled for completion in the first quarter of fiscal year 2018 due to higher priority actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 10, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 10, 2017

DNFSB Activity: Chairman Sullivan and Vice Chairman Hamilton visited the laboratory on Monday through Wednesday. They walked down wings 5, 7, and 9 at the Chemistry and Metallurgy Research Building; rooms in each of the processing areas, the basement, the vault, and some of the outdoor areas at the Plutonium Facility; the Weapons Engineering Tritium Facility; and observed federal readiness assessment (FRA) activities at the Waste Characterization, Reduction, and Repackaging Facility (WCRRF). In addition, they held discussions with the NNSA Field Office Manager and the LANL Deputy Director.

WCRRF–Readiness Activities: On Monday, the FRA team commenced their review of the WCRRF facility and personnel to safely accomplish the treatment of the inappropriately remediated nitrate salt wastes. The team, which is composed of DOE Environmental Management personnel, conducted interviews and observed demonstrations of the waste receipt process and the drum bag-on and bag-off process. For the latter, the team noted stellar command and control practices by the operations crew. On Thursday, operations personnel were preparing to commence an evolution to demonstrate the glovebox-based treatment process when an unplanned loss of electrical power occurred. Facility personnel responded appropriately and have begun troubleshooting the issue. At this point, the impact on the FRA schedule is unknown.

Area G–Safety Basis: On Thursday, the NNSA Field Office Manager unconditionally approved the Evaluation of the Safety of the Situation (ESS) that LANL submitted on May 13, 2016, related to discrepancies in the transuranic waste inventory (see 5/20/16 weekly). This ESS addressed three open Potential Inadequacy of the Safety Analyses—the first of which was declared on December 3, 2014, subsequent to questions raised by the Board’s staff (see 12/5/14 weekly). The primary issue addressed by the ESS were errors in the assumed composition of the waste and its related dispersal properties in a fire. The ESS corrected these errors based on a comprehensive review of the as-found waste inventory, which resulted in changes in consequences for 14 postulated accident scenarios and changes in the details associated with 16 Specific Administrative Controls. The changes in controls primarily involve inventory limits and spacing distances associated with each of the various processes and storage areas with the overall aboveground transuranic waste inventory reduced from 57k to 39k plutonium-239 equivalent curies. Notably, implementation of this ESS is expected to eliminate the postulated aircraft crash accident that results in public consequence in excess of the DOE Evaluation Guideline. LANL previously proposed a 90 day implementation schedule, subject to additional refinement, needed to implement this ESS, primarily due to the need to move about 500 waste containers.

Unremediated Nitrate Salt (UNS) Waste–Safety Basis Strategy: Last Friday, the NNSA Field Office Manager transmitted a letter concurring with LANL’s proposed safety basis strategy and treatment plan for the 29 UNS waste containers currently stored in Area G (see 1/27/17 weekly). In the concurrence letter, the manager also approved LANL’s request to commence preliminary activities necessary to support the UNS treatment campaign.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 17, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 17, 2017

DNFSB Staff Activity: On Wednesday and Thursday, a staff team participated in teleconferences with LANL and NNSA personnel, and members of a seismic expert panel to discuss the details of planned seismic analyses and testing for the Plutonium Facility. Also on Thursday, P.J. Migliorini participated in a teleconference with NNSA, EM and LANL personnel to discuss the current status of the Potential Inadequacy of the Safety Analysis for the flanged tritium waste containers in Area G that may be pressurized with a potentially explosive headspace mixture of oxygen and hydrogen isotopes.

Chemistry and Metallurgy Research (CMR) Building–Safety Basis: The NNSA Field Office Manager recently approved LANL’s submittal of the 2016 annual update to the CMR safety basis. This annual update incorporates a temporary modification that was implemented to support cleanout of the confinement vessels currently stored in Technical Area 55. Additionally, this update closes the only open Evaluation of the Safety of the Situation in the safety basis that was developed for a glovebox found to be inappropriately excluded from the Technical Safety Requirements.

On Thursday, LANL submitted a safety basis temporary modification to the NNSA Field Office for review and approval. The temporary modification revises a previous safety basis change for receipt and storage of a package containing americium-241 (see 1/8/16 weekly). LANL proposes a two phased approach to ensure continued safe storage and ultimate recovery of the isotope for beneficial use. In this temporary modification, LANL identifies Phase 1 activities to include venting and sampling of the existing outer containers holding the material, as well as unpacking and repacking the seven inner containers into individual new outer containers. LANL will perform non-destructive assay and radiography of the inner containers to better characterize their contents and then develop a Phase 2 plan to open the inner containers to recover their contents.

Waste Characterization, Reduction, and Repackaging Facility–Readiness Activities: The Federal Readiness Assessment team continues to evaluate facility and personnel readiness to safely accomplish the treatment of the inappropriately remediated nitrate salt wastes (see 3/10/17 weekly). The team is extending their assessment activities into next week due to last week’s unplanned loss of power and glovebox discrepancies identified by facility personnel this week.

Federal Oversight: On Friday, the review team for the Chief of Defense Nuclear Safety briefed the results of their biennial review of the NNSA Field Office. The 25 member team had been performing aspects of their review since early January (see 1/7/17 weekly). The team identified numerous issues, including four high-level management concerns that cross-cut multiple functional areas. These management concerns cover areas associated with oversight procedures, issues management, staffing, and nuclear safety. Of note, many of the issues overlap with previously identified problems that already have corrective actions underway (e.g., last summer’s organizational health assessment).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 24, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 24, 2017

Federal Oversight: On Tuesday, the NNSA Field Office Manager signed out the annual work force and technical staffing plan. Overall, the plan identifies the need for increased staffing.

Support to Pantex: Weapons response personnel recently commenced a series of experiments to address questions concerning the potential for safety impacts to nuclear explosives operations if a Pantex technician were to fall toward an assembly while carrying various pieces of tooling. The test reports are expected in about a month.

Waste Characterization, Reduction, and Repackaging Facility–Readiness Activities: Last Saturday, the Federal Readiness Assessment team briefed the results of their review. As briefed, the team found that all 23 functional area objectives were met; however, they identified 15 pre-start and 6 post-start findings. Pre-start findings of interest include: questionable ability to notify nearby workers of emergency conditions; maintenance work control documents that include broad provisions to adjust task sequence; and procedural and radiological posting deficiencies. Notably, the assessment team leader complimented the treatment team’s embracement of safety culture and commitment to disciplined operations, while noting them to be among the best that he has seen in the Department of Energy.

Emergency Management–Federal Oversight: The NNSA Field Office Manager recently transmitted to LANL the fiscal year 2017 emergency management program element assessment plan. The plan identifies five program elements to be assessed independently by the field office emergency management program manager including: (1) technical planning basis; (2) emergency exercise; (3) training and drills; (4) emergency public information; and (5) program administration. This action is intended to ensure the field office meets the requirement to conduct independent assessments of all 15 emergency program elements every 3 years, consistent with DOE Order 151.1C, *Comprehensive Emergency Management System*.

Plutonium Facility–Safety Basis: Last Friday, LANL management transmitted to the NNSA Field Office for approval the Evaluation of the Safety of the Situation (ESS) regarding concerns associated with the use of cheesecloth in plutonium-238 operations, specifically the lack of rinsing these materials as stated in the approved safety basis (see 2/3/17 weekly). The ESS summarizes recent LANL thermal studies on temperatures produced in pipe overpack containers with varying quantities of plutonium-238. These results justify the 10 g limit established as part of the initial operational restrictions. Accordingly, the ESS proposes to codify this limit as a Specific Administrative Control to minimize the likelihood of fires associated with cheesecloth and plutonium-238. The reduced loading limit also translates into low potential radiological consequences.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 31, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending March 31, 2017

Inappropriately Remediated Nitrate Salts (RNS) Wastes–Startup Activities: Last Friday, the Associate Director for Nuclear and High Hazard Operations (ADNHHO) approved startup of the RNS denesting and cold-safing activity in Area G. On Thursday, Area G personnel successfully commenced this activity with the removal of the first two RNS drums from their standard waste boxes and subsequent placement into the freezer unit. Area G personnel hope to load eight additional containers into the freezer in the coming week while corrective actions are completed and verified in advance of the startup of treatment activities in the Waste Characterization, Reduction, and Repackaging Facility (WCRRF).

WCRRF–Safety Basis: After contemplating feedback from the federal readiness assessment team, facility personnel decided to pursue authorization to use an electric forklift to unload the RNS containers from the transportation vehicle. Accordingly, on Wednesday they transmitted for approval to the NNSA Field Office a temporary modification to the safety basis. The modification enumerates eight benefits of using an electric forklift as compared to the currently authorized electric drum stacker, including reduction on the amount of manhandling required of the RNS drums, improved operator proficiency and efficiency, and the avoidance of the awkwardness of two people handling a drum at a slight angle with up to a 2000 lbs combined load. To address the potential hazard posed by the electric forklift, the modification proposes four new Specific Administrative Controls regarding forklift inspection prior to use and allowed locations for the electric forklift.

Confinement Vessel Disposition (CVD) Project: On Thursday, CVD personnel completed cleanup and closure of the fifth vessel. This vessel differed from the previous vessels in that it contained impact mitigation material resulting in the generation of 73 transuranic waste drums—a substantially greater number than the previous vessels. The remaining four vessels also contain various impact mitigation materials. CVD personnel expect to receive the sixth vessel in mid-April.

Plutonium Facility–Infrastructure: On Tuesday, facility operations personnel were performing the weekly surveillance on the west pump house diesel firewater pump when they observed elevated temperatures and the release of smoke and steam from the packing gland. They had replaced the gland the previous week after discovery of an unsatisfactory drip rate. At the fact-finding, they were unable to conclusively determine the cause of the failure. However, they discussed the need to re-instate past practices of pre-soaking the gland material prior to installation and allowing additional post-installation soak time prior to operating the pump. The manufacturer does not specify the need for either of these steps. Personnel replaced the packing and successfully returned the pump to service on Wednesday.

Conduct of Operations: On Wednesday, the ADNHHO briefed the NNSA Field Office on a planned initiative to institute a bi-monthly operational performance forum. The forum is designed to bring senior leadership from LANL and the NNSA Field Office together to discuss performance improvement initiatives, as well as selected operational events and associated follow-up actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 7, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 7, 2017

We were at DNFSB Headquarters this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 14, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 14, 2017

Waste Characterization, Reduction, and Repackaging Facility (WCRRF)–Safety Basis:

Last Thursday, the NNSA Field Office Manager, with concurrence from NNSA and DOE-EM Headquarters personnel, unconditionally approved the safety basis change related to the use of an electric forklift for handling of the inappropriately remediated nitrate salt (RNS) waste drums (see 3/31/17 weekly).

WCRRF–Engineering: Last Wednesday, the facility experienced its second momentary loss of electrical power in a month. The previous loss of power occurred as personnel were preparing to commence a performance demonstration as part of the federal readiness assessment (see 3/10/17 weekly). In both cases, the response of facility personnel was appropriate; however, the electrical distribution systems did not respond as intended. In the first instance, the uninterruptible power supply (UPS) did not function properly. In the second instance, the UPS functioned but the automatic transfer switch indicated several potential anomalies. Given the high priority associated with commencing the RNS treatment campaign, LANL senior management has engaged in this situation and placed several additional institutional resources on the problem. They are also pursuing vendor support and installation of additional monitoring devices to augment their typical troubleshooting activities.

Area G–Safety Basis: On Wednesday, the NNSA Field Office returned comments to LANL management pertaining to the technical inadequacy of the Evaluation of the Safety of the Situation (ESS) concerning the Flanged Tritium Waste Containers (FTWCs) with potentially explosive headspace mixtures of oxygen and hydrogen isotopes (see 10/28/16 weekly). The NNSA Field Office identified deficiencies that included: an incorrect energy threshold for ignition that potentially challenges the need to further consider hazards from wind-driven vibrations; inadequate technical bases supporting the exclusion zone distance of 50 feet for protection from projectiles; and insufficient bases to exclude the potential for deflagration to detonation transition.

On Thursday, LANL submitted to the NNSA Field Office for review a set of proposed milestones for high-level actions to be taken to mitigate the hazard posed by the Area G FTWCs. In the proposal, LANL notes that a process hazard analysis will be completed by May 5, 2017, that will determine whether the FTWCs will be safely stored in place or remediated for offsite disposition. LANL indicates that if the offsite disposition path is followed an adequate control set will have to be developed and an updated ESS will have to be approved, and estimates remediation could be completed by September 2018.

Plutonium Facility–Safety Basis: As directed by the NNSA Field Office Manager, LANL submitted a plan and schedule for resolving by August 3, 2017, all outstanding conditions of approval, directed changes, directed actions, Field Office comments and open ESSs that affect the Plutonium Facility safety basis (see 2/24/17 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 21, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 21, 2017

DNFSB Staff Activity: J. B. Weathers observed the Generator Site Technical Review (GSTR). The GSTR is one of several actions that LANL will need to complete in order to resume shipping transuranic waste to the Waste Isolation Pilot Plan. R. Wu and P. J. Migliorini augmented oversight and observed portions of the contractor readiness assessment (CRA) discussed below.

Plutonium Facility–Readiness Activities: On Tuesday, the CRA team commenced their review of aqueous chloride and americium production activities. The planned two week review will cover the restart of aqueous chloride operations including size reduction, dissolution, solvent extraction, and anion exchange, as well as new start activities including americium precipitation, calcination, and packaging and handling.

Plutonium Facility–Fire Event: On Wednesday morning, three operators encountered a pyrophoric materials fire associated with a black powder that they had minutes earlier emptied in a plastic bag from a number of unlabeled legacy containers as part of a facility-wide housekeeping day. Upon discovery, an operator attempted to place the bag into a metal container when the bag conflagrated, causing minor burns to several fingers. He then pushed the cart containing this material to the front of the room away from the glovebox line and smothered the fire using an appropriate handheld extinguisher. The operators called 911, exited the room, and made additional notifications in accordance with procedure. After some thought, programmatic personnel determined the material likely to be lanthanum nickel hydride, which they believed had been used as a hydrogen storage bed for activities roughly 20 years ago. Following this determination, personnel from the LANL Hazardous Materials team were able to stabilize the material without further incident. There was no radioactive release or contamination involved in this fire. At the associated fact-finding, facility and emergency response personnel discussed issues including: protocol for the need to receive permission from the New Mexico Environment Department prior to stabilizing the material; uncertainty on roles and responsibilities and nomenclature regarding incident command; the need to clearly define the scope of approved housekeeping activities; and declared the need for another corner-to-corner inventory for legacy items.

Waste Characterization Remediation and Repackaging Facility–Engineering: On Tuesday, facility personnel held a second fact-finding to discuss the results of troubleshooting activities associated with the recent loss of power events (see 4/14/17 weekly). They discussed completed actions to perform thermography, examine and replace breakers, test cabling, and receive vendor support for the automatic transfer switch (ATS). Based on feedback from the vendor and review of the ATS data log, they concluded that tolerances for certain parameters on the incoming power were overly restrictive. As a result, minor fluctuations would cause the ATS to switch from line to neutral, but return to line prior to engagement of the diesel causing a brief loss of power. Engineers were able to replicate this scenario and have since properly adjusted the parameters. Facility personnel also installed and will be reviewing data from additional power monitors up and downstream of the ATS.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 28, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending April 28, 2017

Waste Characterization, Reduction, and Repackaging Facility (WCRRF)–Readiness:

LANL continues to make progress toward startup of WCRRF to enable processing of the inappropriately remediated nitrate salt (RNS) wastes currently stored in Area G. On Thursday, the Associate Director for Nuclear and High Hazard Operations (ADNHHO) submitted to the Startup Authorization Authority for review and approval a request to commence WCRRF operations in a two-phased approach. Included in the request was the causal analysis and final corrective action plan for the WCRRF federal readiness assessment (FRA), as well as the objective evidence files for the closure of FRA pre-start findings. The ADNHHO request notes that one pre-start finding remains open—the process for treating the RNS waste has not been approved by the National TRU Program and Environmental Management Headquarters as required. The ADNHHO proposes phase 1 of the WCRRF startup would allow processing of surrogate materials in the Waste Characterization Glovebox with the facility in OPERATIONS MODE. Phase 2 of the startup would allow receipt of the RNS waste from Area G and would allow processing of the waste following approval of the treatment process.

WCRRF–Electrical Distribution System (EDS): LANL engineering personnel have identified additional issues with the WCRRF EDS following the adjustments made to the automatic transfer switch last week (see 4/24/17 weekly). Most recently, the WCRRF operations center, which is in an adjacent building to the main processing area, lost power unexpectedly. Notable loads that were lost include the waste management tracking database and the video monitors installed in WCRRF to observe RNS treatment activities. Engineering personnel conducted troubleshooting that revealed the transformer feeding the operations center building was not bonded, the building’s power panel had a loose connection on the main neutral, and the breaker for one phase of the main feed was not making proper contact. These issues were all addressed and the system returned to service. Of note, the automatic transfer switch data loggers indicated discrepancies with the phase feeding the operations center building that had occurred prior to the repairs being made. Engineering personnel will continue to monitor the data loggers into next week to see if the repairs have successfully eliminated the anomalies prior to completing the system operability determination.

Plutonium Facility–Infrastructure: On Tuesday, facility personnel were performing the weekly surveillance on the west pump house diesel firewater pump when the diesel unexpectedly shut down. Operations personnel entered the appropriate Technical Safety Requirement Limiting Condition for Operations and have commenced troubleshooting activities.

Transuranic Waste Facility (TWF)–Readiness Activities: Last Friday, a management self-assessment team briefed the results of their assessment of TWF readiness to begin operations. During the brief, the team identified 24 pre-start and 9 post-start findings as well as 5 noteworthy practices. The team also commended the workers’ professionalism and willingness to pause or stop work when the unexpected occurs.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 5, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 5, 2017

Waste Characterization Reduction and Repackaging Facility–Restart: Last Friday, the NNSA Field Office approved the corrective actions from the federal readiness assessment regarding the treatment of the inappropriately remediated nitrate salt (RNS) waste. Additionally, they granted LANL management permission to commence a phased startup of treatment activities. The approval letter notes that one pre-start finding associated with Department of Energy approval of the treatment procedure remains outstanding. As such, LANL is authorized to perform phase 1 of the startup plan involving the treatment of surrogate wastes. LANL must notify NNSA and EM managers prior to phase 2 activities with the actual RNS wastes. On Tuesday, program personnel commenced processing of the first container of surrogate waste. They plan to process at least two additional containers of surrogate next week.

Area G–Emergency Management: On Thursday, Area G personnel conducted an instructional emergency drill against their procedure for potential wildland fire impacts to the RNS waste containers currently stored in the Dome 375 Permacon. The procedure directs actions related to the Permacon ventilation system and the installation of fire blankets on the RNS containers. Separately, Area G personnel recently completed turnover for the backup electric diesel generator for the Permacon.

Plutonium Facility–Readiness Activities: Last Friday, the contractor readiness assessment team briefed the results of their review of aqueous chloride and americium production activities. The team identified two pre-start findings on training associated with the response to a process deviation and operations center actions during criticality alarm testing. Additionally, there are three self-identified pre-start findings regarding the calibration of tanks and the need to consider the caustic waste liquid discharge from the chloride processes as part of the technical basis for criticality safety at the Radioactive Liquid Waste Treatment Facility.

On Tuesday, the NNSA Field Office responded to a request from LANL management to re-evaluate the readiness activities associated with startup of the new electrorefining line and the startup of a new mobile loading activity for offsite shipment of transuranic waste. In both cases, the field office overruled LANL's proposal for performing only management self-assessments and determined that appropriately scoped federal readiness assessments were warranted.

Plutonium Facility–Infrastructure: Last Friday, facility management accepted for operation the new Criticality Alarm System, one of the sub-projects associated with Phase II of the TA-55 Reinvestment Project. Project personnel expect to complete some additional modifications to the previous system in order to retain the capability for remote area radiation monitoring. On Tuesday, the west safety class diesel firewater pump failed its weekly surveillance test when it tripped offline and did not restart. A similar problem occurred with this same pump last week. They are currently troubleshooting and plan to hold a fact-finding on the situation next week. On Wednesday, an engineer photographing penetrations in the safety class confinement structure observed rays of sunlight coming through one of the penetrations. It is unlikely that the engineer would have noticed this breach except for the particularly dark location of this penetration. Facility staff responded appropriately and repaired the condition in the afternoon.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 12, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 12, 2017

Fire Protection: Two small fires occurred at the laboratory this week—one at the Los Alamos Neutron Science Center and the other at the Sigma Complex. In both instances, lab employees extinguished the fire; however, notification to the fire department was delayed in the first instance and did not occur in the second. In particular, the fire at Sigma Complex involved an activity with depleted uranium metal turnings performed under an integrated work control document that provided workers with an allowance to avoid calling the fire department if they were able to extinguish the fire using graphite powder or machining coolant. In response to these events, fire protection personnel are reinforcing the need to contact the fire department as part of training and procedures.

Emergency Management: On Thursday, LANL personnel conducted their annual full-scale emergency exercise. This year's scenario involved a simulated spill of chromic acid with a concurrent fire at the Sigma Complex that resulted in chemical burns to two individuals and smoke inhalation to an additional six. In an attempt to reduce simulation, fire department responders utilized breathing apparatus and transported mannequins as victims. At the hotwash, several participants highlighted the benefits from recent training, tabletops, and drills. Additionally, NNSA Field Office performed an independent evaluation of the exercise utilizing additional experts from the NNSA Office of Emergency Operations and the Carlsbad Field Office.

Waste Characterization Reduction and Repackaging Facility–Restart: On Monday, while preparing equipment to treat the second container of surrogate waste, operators observed a potential crack in the waistband associated with the drum lifting fixture on the waste characterization glovebox. As a result, operators entered the limiting condition of operation for this credited equipment. On Thursday, operators executed a work package to replace the waistband thereby restoring the operability of the drum lifting fixture. They continue to troubleshoot a separate issue with the limit switch for the lift.

The EM and NNSA Field Offices have implemented a federal oversight plan for LANL's processing of the remediated nitrate salt waste drums. The plan ensures continuous federal coverage for the processing of two surrogate and the first ten remediated nitrate salt waste drums.

Plutonium Facility–Safety Basis: On Wednesday, LANL submitted to the NNSA Field Office for approval, an update to the plan and schedule for resolving all outstanding conditions of approval, directed changes, directed actions, Field Office comments and open evaluations of the safety of the situation that affect the Plutonium Facility safety basis (see 4/14/17 weekly). LANL submitted the update to provide specific dates for closure of outstanding items. LANL's update also proposes to submit for approval no later than August 31, 2017, a project plan for incorporating into the safety basis the most recent site meteorological data and an updated strategy for fire and leak path factor modeling.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 19, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 19, 2017

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: This week, after more than three years of investigation and testing, process and safety basis development, and readiness activities, LANL workers successfully treated the first RNS waste drum to remove its ignitability characteristics. Last Friday, the EM Deputy Assistant Secretary for Safety, Security, and Quality Assurance approved a request from the EM Field Office Manager to close the last two judgements of need from the LANL corrective action plan for the February 2014 radiological release event at the Waste Isolation Pilot Plant. On Wednesday, LANL personnel transferred three RNS containers from the refrigerator in the Dome 375 Permacon to the refrigerator at the Waste Characterization Reduction and Repackaging Facility (WCRRF). On Thursday, WCRRF operators successfully treated the contents of one RNS drum, and on Friday they removed from the glovebox used for treatment one drum of treated RNS, one drum of debris, and the empty parent drum that originally contained the RNS waste. LANL personnel will leverage some lessons learned during the processing of this first drum to gain efficiencies and improve the treatment procedures. WCRRF personnel are scheduled to commence treatment of the second RNS drum next Monday. LANL’s current schedule predicts completion of the RNS campaign in early August.

WCRRF–Safety Basis: On Tuesday, LANL submitted to the NNSA Field Office for review and approval, a revision to the WCRRF Basis for Interim Operation and Technical Safety Requirements to support processing the 29 unremediated nitrate salt (UNS) waste containers currently stored in Area G. LANL plans to commence treatment of the UNS waste immediately following the RNS campaign with a goal of completing all remediation before Area G contract turnover scheduled for the end of this fiscal year.

Transuranic Liquid Waste (TLW) Treatment Facility Project: On Thursday, the NNSA Field Office approved LANL’s submittal of a revised Safety Design Strategy for the TLW treatment facility. In the approval letter, NNSA directed LANL to: 1) design and construct the TLW active confinement ventilation system using the American Society of Mechanical Engineers Code on Nuclear Air and Gas Treatment, and 2) perform a cost benefit analysis between using the most current version of DOE Standard 3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analyses*, and its predecessor version issued in 1994 which is currently in the code of record. Of note, the NNSA Field Office and LANL management incorporated the 2014 version of the standard into the contract as part of modification 359, which was jointly approved on August 11, 2016.

Plutonium Facility–Confinement: On Thursday, an NNSA Facility Representative identified two conduits penetrating the facilities confinement boundary to be loose. Facility personnel entered the appropriate Limiting Condition for Operations (LCO) and subsequently sealed the penetrations. Also on Thursday, facility personnel identified a broken hinge pin on a facility confinement door latch to be broken. Facility personnel again entered the appropriate LCO and have commenced repair work.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 26, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending May 26, 2017

DNFSB Staff Activity: D.K. Andersen, M.W. Dunlevy, R.L. Jackson, and P.J. Migliorini were at the laboratory this week to review the status of several efforts associated with the Plutonium Infrastructure Strategy. M.W. Dunlevy and P.J. Migliorini also observed treatment activities associated with the inappropriately remediated nitrate salt (RNS) wastes and walked down three radiological facilities.

RNS–Treatment Activities: Waste Characterization Reduction and Repackaging Facility (WCRRF) personnel successfully treated a second RNS container this week. However, they encountered several challenges and issues that prolonged the treatment of this drum, including:

- Substantial debris that was expected based on radiography of the container, but at times became challenging for operators to manage in the limited space of the glovebox
- Difficulty macerating cellulosic wipes in the blender because they were too dry, which is a pre-requisite to ensure effective mixing with zeolite as part of the treatment process—resolution of this issue necessitated a procedure change to pre-soak the wipes
- An unexpected large area cloth wipe that required the use of the manual cloth treatment section of the procedure
- Poor control of the pedigreed zeolite feed material that resulted in the need to retreat some material
- Several procedural issues, including instances where workers paused, as well as one instance when Department of Energy Headquarters oversight prompted the proper response

Following completion of the container on Friday, management conducted a lessons-learned discussion with the workers. Also this week, workers at WCRRF received two additional RNS containers and returned three daughter transuranic waste containers back to Area G.

Plutonium Facility–Infrastructure: On Monday, Plutonium Facility personnel held a fact-finding to discuss last week’s discovery of two degraded confinement penetrations (see 5/19/17 weekly). This was the second instance of degraded confinement penetrations discovered this month (see 5/5/17 weekly). The confinement structure is a safety class system that is relied upon to mitigate the release of radioactive material to the environment. The safety basis notes that the penetrations are to be air and watertight with an associated performance criterion to be sealed with a through-penetration assembly that is appropriately pedigreed with a 2-hour fire rating. Fact-finding participants viewed images and video of the degraded penetrations that revealed one conduit had about an inch of horizontal travel and both had about 60 degrees of spin. Workers noted that the condition was discovered when an NNSA Facility Representative incidentally handled the conduit on a walk-down focused on an unrelated matter. Of note, in all three instances, the penetrations would have likely passed the required visual in-service inspection. In response to this apparent weakness, facility management is evaluating whether a sampling of other penetrations is warranted.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 2, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 2, 2017

DNFSB Staff Activity: On Wednesday, B.K. Caleca, M.W. Dunlevy, P.J. Foster, P.J. Migliorini, and J. Parham conducted a teleconference with Transuranic Waste Facility project personnel to discuss the results of their review of the commercial grade dedication process for the Seismic Power Cutoff System.

Area G–Emergency Management: On Wednesday, Area G personnel conducted their annual emergency exercise. This year’s scenario involved the collision of a truck with a forklift resulting in four breached transuranic waste drums and two injured workers. Participants included Area G personnel, the LANL Emergency Management and Response organizations, and the Los Alamos County Fire Department. Evaluators will hold their critique next Monday.

Emergency Management: On Wednesday, two post-doctoral researchers at the TA-48 Radiochemistry facility observed flames from the depleted uranium metal turnings that they were cleaning with nitric acid in a fume hood. The researchers choose not to fight the fire, closed the hood sash, pulled the fire alarm, and contacted 911. The Los Alamos County Fire Department, LANL emergency management, and the LANL hazardous materials team responded. No radioactive contamination, injuries, or damage beyond the containment tray in the fume hood occurred. Facility, program, and emergency response personnel held a fact-finding on Thursday to discuss the response. Of relevance to the broader emergency management program at the laboratory, several individuals indicated that they did not receive a mass notification message to stay clear of TA-48 because the notification is based on office location and some TA-48 users have their offices in other locations. No corrective action was assigned for this point. Facility personnel discussed challenges using their accountability process during the lunch hour and proposed to review the process and conduct a future accountability drill. Management also concluded that the fire did not meet Department of Energy reporting criteria for a fire and instead reported the event as a management concern.

Plutonium Facility–Safety Basis: On Thursday, the NNSA Field Office Manager conditionally approved a temporary modification to the safety basis associated with the mobile loading of transuranic waste containers. This new activity provides the capability for Plutonium Facility personnel to directly load transuranic waste containers for offsite shipment to the Waste Isolation Pilot Plant—similar to the RANT Shipping Facility. The condition of approval prohibits assembly of payloads that include pipe overpack containers until such time that the accidents involving these containers are re-evaluated using the results of the ongoing testing efforts. The approval letter also stipulated that the temporary modification expires in two years and directs LANL to include the contents of the temporary modification in the next annual update of the safety basis.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: Waste Characterization, Reduction, and Repackaging Facility workers successfully treated two RNS drums. On Thursday, they received two additional RNS drums and returned three daughter transuranic waste drums to Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 9, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 9, 2017

DNFSB Activity: On Tuesday, Board Member Santos discussed the state of emergency preparedness and response with managers from the NNSA Field Office, LANL, and the Los Alamos County Fire Department. On Wednesday, Board Members Sullivan, Hamilton, Connery, and Santos received a briefing at the laboratory concerning the nuclear material inventory in the Plutonium Facility. That evening, they conducted a public hearing in Santa Fe regarding the safety posture of the Plutonium Facility.

DNFSB Staff Activity: Hanford Resident Inspector D.M. Gutowski observed the federal readiness assessment discussed below. M.W. Dunlevy was on site to support the Board visit and to observe the readiness assessment.

Transuranic Waste Facility (TWF)–Startup Activities: On Monday, a contractor operational readiness review team commenced their assessment of the TWF to commence nuclear operations. The review is scheduled to be completed next week and is to include performance demonstrations, various interviews, and an emergency exercise.

Plutonium Facility–Safety Basis: Late last month, LANL submitted to the NNSA Field Office for review and approval the 2017 annual update to the safety basis. In addition to this document, the safety basis document list currently indicates that the facility is operating under three versions of the Documented Safety Analysis and two versions of the Technical Safety Requirements.

Plutonium Facility–Readiness Activities: NNSA conducted a federal readiness assessment for the restart of aqueous chloride operations and the new start of americium oxide production capabilities (see 4/21/17 weekly). The review team concluded that the contractor is ready to begin these operations following completion of corrective actions for one prestart finding. The finding involves a lack of documentation to protect accident analysis assumptions in the safety basis associated with the mass of americium-241 used in this operation.

Federal Oversight: Last Wednesday, the DOE-EM Deputy Assistant Secretary for Safety, Security, and Quality Assurance approved a memorandum delegating specific safety authority approvals to the EM Field Office Manager. In the approval letter, the Deputy Assistant Secretary notes that because the EM Field Office is not yet fully staffed compensatory measures are necessary to ensure adequate subject matter expertise is used to support execution of the delegated safety authorities.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: This week, Waste Characterization, Reduction, and Repackaging Facility personnel successfully treated two more RNS waste drums for a total of six drums treated to date. They also received two additional RNS drums and returned 15 daughter transuranic waste drums to Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 16, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 16, 2017

Transuranic Waste Facility (TWF)–Emergency Management: On Tuesday, TWF personnel conducted their annual emergency exercise. The scenario involved a pool fuel fire from the transportation vehicle that engulfed a load of 16 transuranic waste drums. Notably, this was the third exercise that involved a new rigorous and comprehensive approach to the player hot-wash and evaluator critique. For the latter, evaluators met for more than three hours to develop a common understanding of the timeline for significant events and discuss issues and best practices for each of the response elements. A sampling of the issues they self-identified include: workers in the yard mustered in a location downwind of the fire; fire department assets also approached from downwind; there is not a fire hydrant in proximity to the south entrance; the fire department’s map lacked indication of hydrants; the need to include more subject matter experts in the exercise design and evaluation process; and the need to exercise, instead of simulate, the deployment of additional radiological control technicians (RCT) from other facilities. Fire department personnel also noted the benefits of the realism achieved by using an actual truck and smoke generator over past simulations.

Conduct of Engineering: On Tuesday, LANL management informed the NNSA Field Office that they intend to discontinue by the end of the month the practice of conducting vital safety system assessments for passive safety systems. They note that there is no requirement for this practice and assert that the ongoing system health reporting and in-service surveillance processes remain robust and effective.

Plutonium Facility–Infrastructure: Facility engineers recently completed their evaluation of the need to further examine a sampling of penetrations in the safety class confinement. They determined that six penetrations will be examined by August 11, 2017. This is a corrective action in response to earlier discoveries of three penetrations with degraded seals that would have otherwise passed the visual inspection criteria (see 5/26/17 weekly).

Plutonium Facility–Readiness Activities: During the past eight days, facility personnel have performed a series of assessments to determine readiness to perform mobile loading of TRUPACT II waste containers. Startup of this activity will allow operators to load transuranic waste from the high-efficiency neutron counter pad at Technical Area-55 and ship the waste directly to the Waste Isolation Pilot Plant (WIPP). The ability to ship transuranic waste directly to WIPP is essential while the RANT Shipping Facility is non-operational due to ongoing seismic and safety basis upgrades. On Friday, a contractor readiness assessment team out-briefed the results of their review and identified one pre-start finding concerning missing elements and inaccuracies with the critical lift plan, which is identified in the safety basis as a Specific Administrative Control.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: This week, Waste Characterization, Reduction, and Repackaging Facility (WCRFF) personnel successfully treated two more RNS waste drums, including the sibling of the drum involved in the radiological release event at the WIPP, for a total of eight drums treated to-date. Processing activities have taken more than a single day for each of the eight drums. Subsequently, WCRFF management recently modified their implementation practices for the stationary fire watch, which is required when a parent drum remains in process during off-hours. The new process relies on the fire watch using a camera system supplemented with hourly facility entries and, if needed, assisted by an RCT on call within two hours.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 23, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 23, 2017

DNFSB Staff Activity: On Thursday, M.W. Dunlevy and P.J. Migliorini conducted a teleconference with staff from the NNSA Field Office to discuss questions related to the safety basis provisions for the storage and mobile loading of transuranic waste at TA-55 outdoor pads.

Transuranic Waste Facility–Startup Activities: Last Friday, the 13 member contractor operational readiness review team out-briefed the results of their assessment. They identified five pre-start findings associated with: (1) procedural control of hand placement during a loading evolution; (2) premature declaration of readiness in the functional areas of operations, procedures, and radiation protection; (3) lack of formality in execution with in-service inspections; (4) lack of adequate procedural field validation; and (5) improper radiological controls coverage during evolutions and the emergency exercise. The post-start finding involved issues with preventive maintenance evaluation and implementation. Overall, the team concluded that 15 of 17 primary objectives were met and that the issues with procedures and operator performance can be corrected through proper use of existing LANL programs.

Plutonium Facility–Infrastructure: On Tuesday, NNSA Field Office personnel in-briefed their assessment of the safety-class firewater pumps. The purpose of the review is to assess the adverse trend of numerous outages with the pumps and the associated risk to the reliability of the safety-class control. They expect to issue a report in August 2017.

Plutonium Facility–Criticality Safety: Last Friday, nuclear criticality safety personnel, including some newer staff members, were walking-down a room with a safe containing nuclear material to assess concerns regarding housekeeping when they observed a piece of shielding affixed to one side of the safe. They were unable to find evidence that this condition had been evaluated, as required by the posting, and declared a process deviation. At the fact-finding, personnel determined that the as-found configuration, including consideration of the current nuclear material contents, was safe and that they would add the shielding issue to the other two infraction issues associated with this safe's out-of-service condition. They also noted that the shielding had not been detected on the last two annual walk-downs and decided to further evaluate the need for an extent of condition review and a change to the walk-down checklist.

Area G–Safety Basis: On Monday, the NNSA Field Office issued direction to LANL regarding the need for an additional compensatory measure associated with the safe storage of the Flanged Tritium Waste Containers with potentially pressurized and flammable headspaces. The new compensatory measure requires LANL personnel to utilize appropriate protective equipment should there be a need to enter the 50 foot exclusion zone during emergency conditions. The Field Office observed the need for this control after a LANL worker approached the shed without any protective equipment in order to close a door that had opened.

On Thursday, the NNSA Field Office denied approval of the Evaluation of the Safety of the Situation (ESS) submitted on July 8, 2016, regarding the Potential Inadequacy of the Safety Analysis associated with the behavior of certain sealed sources in fire events (see 4/29/16 weekly). They requested that the laboratory resubmit the ESS within 120 days to improve the rigor and quality of the fire analysis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 30, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending June 30, 2017

DNFSB Staff Activity: M.R. Bradisse, R.C. Eul, N.M. George, J. McKamy, and P.J. Migliorini were at the laboratory this week to review the effectiveness of actions taken to improve nuclear criticality safety and conduct of operations at the Plutonium Facility.

Emergency Management: Last Thursday, LANL issued the after-action report for this year's full-scale exercise (see 5/12/17 weekly). This is the first such report issued after strengthening the evaluation process to achieve an improved level of self-criticism. Evaluators determined that 10 out of 126 applicable objectives were unmet, including 8 findings. Findings of note include: the Emergency Manager incorrectly selected the Emergency Action Level (EAL) based on indicators from the facility—the report further notes that the EALs are confusing and difficult to navigate; Protective Action Recommendations for the public were not issued in accordance with the EAL; Occupational Medicine staff failed to implement measures to manage potential contamination; and the site-wide mass notification system was not effectively implemented and failed to provide accurate information to building occupants. The report also identified 14 opportunities for improvement and a further 27 observations. Items of note from these categories include: the need to strengthen the use of WebEOC® and the associated display of information for situational awareness in the Emergency Operations Center (EOC); the incident command post was initially setup within the isolation zone due to communications challenges; plume modeling responders departed for the EOC prior to receiving safe route information, since they suspected that they would otherwise get caught in a shelter-in-place; and facility management lacked familiarity with the EALs.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: During the past two weeks, Waste Characterization, Reduction, and Repackaging Facility workers successfully treated three RNS drums for a total of eleven treated since the campaign started on May 18, 2017. Recent challenges included ventilation system failures, continuous air monitor alarms subsequently determined to be false, and unanticipated items discovered in the waste.

Weapons Engineering Tritium Facility (WETF)–Flanged Tritium Waste Containers (FTWC): Last Thursday, the NNSA Field Office Manager approved LANL's Evaluation of the Safety of the Situation (ESS) for three FTWCs stored within WETF that may be pressurized with a potentially explosive headspace mixture of oxygen and hydrogen isotopes (see 12/22/16 weekly). In the approval letter, the NNSA Field Office Manager directs WETF management to revise a standing order that implements the current operational restrictions to include prohibition of intentional movement or venting of the FTWCs until further notice from the NNSA Field Office. The approval letter directs WETF management to implement the statement regarding no intentional movement or venting of the FTWCS through a Specific Administrative Control in the WETF Technical Safety Requirements. The NNSA Field Office Manager also directed LANL to submit a plan to update the safety basis to support FTWC remediation and to address additional ESS review comments by late August.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 7, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 7, 2017

Federal Oversight: This week, the NNSA Field Office initiated a special assessment team to oversee and evaluate LANL's causal analysis and corrective actions associated with the recent incidents involving the inappropriate air cargo shipping of plutonium. The team will also perform a meta-analysis of other recent incidents with similar contributing causes and evaluate the plans to resume offsite shipment of hazardous and radioactive cargos.

Last Friday, the EM Field Office Manager assumed authority for safety basis approval and startup authorization for work associated with Area G and the Nuclear Environmental Sites.

Plutonium Facility–Seismic Safety: On Wednesday, NNSA Field Office and LANL personnel briefed the NNSA Associate Administrator for Safety, Infrastructure, and Operations, on the status of plans to procure a nonlinear dynamic analysis of the facility structure and a separate, but related effort, to test the performance of column capitals. The Associate Administrator approved moving forward with both procurements. The preliminary high-level schedule indicates that completion of both efforts will necessitate approximately two years.

Area G–Safety Basis: Last Friday, LANL submitted to the EM Field Office for review, a proposed safety basis strategy to support transuranic waste shipments from other LANL facilities to Area G. The strategy identifies the need to cancel the operating restrictions on transuranic waste receipt put in place following an inadequacy in the safety analysis regarding material-at-risk inventory discrepancies (see 5/20/16 weekly), as well as a need to increase allowable material-at-risk limits. The LANL strategy proposes to first revise the evaluation of the safety of the situation put in place for the material at-risk-discrepancies to allow transuranic waste receipt, and then to revise the current safety basis to increase material-at-risk limits. LANL notes in the strategy that these changes are necessary to support mission needs, in particular to alleviate waste storage issues at the Plutonium Facility.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: Waste Characterization, Reduction, and Repackaging Facility (WCRRF) workers successfully treated the 12th RNS drum. They also received two additional RNS containers from Area G. Last week, Area G personnel denested four containers of unremediated nitrate salts (UNS) to evaluate drum integrity. They encountered drum degradation and determined that the poly drum liners will likely need to be pulled and placed into new drums prior to shipment to the WCRRF.

Last Friday, LANL management informed the EM Field Office that they would not meet the current contractual milestones for processing of RNS and the UNS wastes of June 30 and September 30, 2017, respectively. Their current working schedule, which was adjusted using efficiency data from the completed portion of the campaign, now projects respective completions of December 22, 2017, and April 10, 2018. WCRRF management is actively engaging workers for feedback on additional efficiency opportunities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 14, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 14, 2017

DNFSB Activity: On Thursday, NNSA Headquarters and Field Office personnel briefed the Board Members on the results and path forward associated with the 2017 review performed in accordance with NNSA Supplemental Directive 226.1-1A, *Headquarters Biennial Review of Nuclear Safety Performance* (see 3/17/17 weekly).

Plutonium Facility–Housekeeping: On Wednesday, management completed their extent of condition review stemming from the fire associated with unlabeled pyrophoric legacy materials (see 4/21/17 weekly). As a result, they determined that there was a need for eight additional multi-item actions to remedy the identified issues. Examples of the identified issues include items that were unlabeled, missing barcodes, otherwise lacking acceptable knowledge, or located in inaccessible spaces. Management’s plan is to complete the actions by the end of August 2017.

Area G–Flanged Tritium Waste Containers (FTWC): On Tuesday, two maintenance workers crossed a barrier intended to restrict access to a 50-foot exclusion zone around the FTWCs with potentially explosive headspace mixtures of oxygen and hydrogen isotopes (see 10/28/16 weekly). The exclusion zone was established as a safety significant Specific Administrative Control in the Evaluation of the Safety of the Situation to protect workers from a potential explosion accident. In addition to a roped barrier with signs indicating restricted access, the exclusion zone is implemented through a standing order.

During a fact-finding of the event, the worker with access to Area G who was acting as the escort admitted to mistakenly crossing the boundary, not recognizing it as an exclusion area. Management identified the escorting worker had not been trained on and had not read the standing order. Additional issues identified during the fact finding included: (1) the hazard identification and control worksheet included in the work package was not updated when the exclusion zone was established; (2) the badge reading system at Area G is not capable of tracking the training requirements necessary for access; (3) the plan of the day did not indicate the maintenance was going to be performed in this particular location; and (4) operations center personnel did not ascertain the intended location of the maintenance when the workers checked in prior to commencing their work. Facility management is taking immediate actions that include installing a more robust barrier around the exclusion zone and ensuring all personnel with access to Area G are personally briefed on the exclusion zone. LANL personnel are also conducting a causal analysis of the event, as well as an extent of condition review.

Transuranic Waste Facility (TWF): On Thursday, NNSA Field Office personnel briefed NNSA Headquarters on the path forward regarding the malfunctioning seismic power cutoff system. The system is a safety class control intended to isolate electrical power to the waste storage building upon detection of a seismic event. TWF personnel encountered issues with this new system’s internal fault-checking functions, as well as oversensitivity to severe weather and have proposed an 18 month plan to develop a retrofit. In the interim, they are proposing a new surveillance requirement to compensate for the impaired functionality. On Friday, the NNSA Field Office approved this proposal.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 21, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 21, 2017

Plutonium Facility–Transuranic (TRU) Waste Operations: On Thursday, a Federal Readiness Assessment team briefed the results of their review of Plutonium Facility readiness to perform mobile loading of TRUPACT II waste containers for offsite shipment to the Waste Isolation Pilot Plant. The team concluded that operators adequately demonstrated their ability to start this new activity and identified one post-start finding relating to the Plutonium Facility’s Unreviewed Safety Question process. Last Friday, the NNSA Field Office Manager approved a temporary modification to the Plutonium Facility safety basis that rescinds previous direction excluding pipe overpack containers from the mobile loading activity (see 6/2/17 weekly). The approval letter notes that allowing POCs in mobile loading activities is essential to ongoing Plutonium Facility material-at-risk reduction efforts.

Transuranic Waste Facility (TWF): On Thursday, LANL transmitted to the NNSA Field Office for review and approval, an execution plan for a redesign of the malfunctioning TWF seismic power cutoff system (see 7/14/17 weekly). LANL’s plan details the scope and schedule to complete the redesign in 18 months to ensure the system meets its performance criteria and design requirements.

Chemistry and Metallurgy Research (CMR) Building–Emergency Management: On Thursday, CMR personnel conducted their annual emergency exercise. This year’s scenario included an explosion and a brief fire in the facility ventilation system ducting that seriously injured a maintenance worker. Participation included CMR personnel, the LANL Emergency Management and Response Organizations, and the Los Alamos County Fire Department. Evaluators will hold their critique next Monday.

Plutonium Facility–Infrastructure: Last Tuesday, the east safety class diesel firewater pump failed its weekly surveillance test when it did not continue running after startup. Maintenance personnel completed troubleshooting that revealed a faulty relay in the starting circuitry. On Wednesday, the diesel was repaired, successfully retested, and placed back in service. On Thursday, LANL submitted to the NNSA Field Office for review and approval, a request for extension of the Evaluation of the Safety of the Situation (ESS) for the potential non-conservatism in the seismic capacity of the fire suppression system (see 6/17/16 weekly). LANL’s request notes that the current ESS expires on August 3, 2017, and engineering personnel require additional time to evaluate potential interaction issues with non-seismically qualified equipment and the fire suppression system to support revision of the ESS.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: Waste Characterization, Reduction, and Repackaging Facility workers successfully treated the 17th RNS drum. On Wednesday, a worker discovered the safety-significant drum lift was missing a hinge pin clip. Operations personnel entered the appropriate Limiting Condition for Operations while maintenance personnel replaced the clip and returned the drum lift to service.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 28, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: R.K. Verhaagen and J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending July 28, 2017

DNFSB Staff Activity: On Thursday, B.K. Caleca, Y. Li, P.J. Migliorini, and L. Schleicher conducted a teleconference with LANL personnel to review the design for the seismic retrofit of the RANT Shipping Facility. The team also discussed the risk associated with proceeding with the retrofit prior to revising the safety basis to better understand the overall seismic control strategy.

Plutonium Facility–Infrastructure: On Tuesday, the west diesel firewater pump failed its weekly surveillance due to an issue with packing. Operations staff entered the appropriate limiting condition for operations, initiated troubleshooting, and returned the pump to service on Friday. Last week's firewater pump issue concerned the east diesel firewater pump (see 7/21/17 weekly).

Recently, facility staff received and placed the new diesel electric generators intended to support the electric firewater pumps at each pump house. Once installation is complete and associated safety basis changes are approved and implemented, the electric firewater pumps will eliminate dependency on the diesel pumps that have proven problematic in recent years. Unfortunately, placement of the east generator was hindered by an alignment problem between cast-in-place bolts and the anchor points on the base of the generator. Engineering personnel believe that the bolts shifted after the concrete was placed and was not caught because a confirmation measurement was not performed. Engineering is now developing a solution to ensure the attachment meets the required safety class, performance category 3 functions.

Transuranic Waste Facility (TWF): On Thursday, the NNSA Field Office approved and forwarded to NNSA Headquarters for final approval LANL's requested changes to a previously approved exemption request regarding the safety class seismic switches. The original 2013 exemption request against requirements in DOE Order 420.1B, *Facility Safety*, specified a certain separation distance between the switch enclosures and a prohibition on combustible materials between the enclosures that the TWF project did not meet with the as-built configuration. Additionally, the original request relied on the project installing safety significant fire suppression in the utility buildings; however, the fire suppression system is not currently scheduled to achieve this status until February 28, 2018, with the potential that the facility will commence nuclear operations prior to that date.

On Thursday, LANL management transmitted to the NNSA Field Office their closure package from the Contractor Operational Readiness Review (see 6/23/17 weekly). The causal analysis codes identified included: adequate means not provided to assure quality procedures; resources not provided to assure adequate training; management expectations not well-defined, understood, or enforced; written communication content incomplete; and management monitoring of activities did not identify the problems. The Federal Operational Readiness Review is scheduled to commence on Monday.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: Waste Characterization, Reduction, and Repackaging Facility workers successfully treated the 20th RNS drum, including the first pipe overpack container. On Thursday, operators paused work when they noticed a tear in the containment bag between the glovebox and a debris drum. Radiological control technicians located and cleaned up small amounts of contamination in the vicinity of the debris drum.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 4, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending August 4, 2017

DNFSB Staff Activity: D.J. Brown observed the Federal Operational Readiness Review (FORR) for the Transuranic Waste Facility (TWF) project discussed below.

TWF–Readiness: On Monday, the FORR team commenced their review of the facility’s equipment, personnel, and procedures to start nuclear operations. The review is scheduled to complete next Wednesday and entails numerous interviews and observations of work evolutions, including emergency and operational drills. Notably, the FORR team requested demonstrations using sets of four weighted drums, which represents the anticipated work conditions. Previously, TWF workers had used no more than two empty drums for practice and evaluation purposes.

Completion of the FORR, including any subsequent corrective actions, is the last formal hurdle for this new project since its inception in 2006. Once the TWF is operational, the facility will represent a significant improvement to the safety posture of stored transuranic waste as compared to Area G and the outdoor pads at the Plutonium Facility. However, the project has had a history of deviations from DOE requirements and expectations that have impaired the facility’s ability to support key risk reduction efforts across the laboratory and suggests there are lessons to be learned. For example, the original mission need statement identified required capabilities that included waste storage, certification, container repackaging, and TRUPACT II shipping operations. The latter two capabilities were eliminated from the project scope with a strategy to rely on existing facilities. The project has also deferred the scope to install the certification capability meaning that the TWF will temporarily be unable to fully enable shipments to the Waste Isolation Pilot Plant. From a safety systems perspective, the new safety class seismic switches do not function as intended, including inadvertent actuations from severe weather, and require execution of an 18 month plan for replacement. The project also requires changes to a previously approved exemption after the as-constructed seismic switch enclosures did not comply with the conditions of exemption. The fire suppression system will begin operation as defense-in-depth and achieve its required safety significant status by the end of February 2018. The approved fire hazards analysis lists 13 open issues, deficiencies, and recommendations, in addition to the 11 that have been remedied. NNSA has imposed compensatory measures for these conditions; however, the overall safety basis and environmental permit is such that only about a third of the accumulated transuranic waste container inventory at the Plutonium Facility is currently eligible for receipt at the TWF. Additionally, as startup nears, the project has not obtained most of the critical spares needed for the suite of credited safety systems.

Plutonium Facility–Infrastructure: Earlier this week, issues with a motor controller for a fan necessitated multiple unplanned entries into the limiting condition for operations associated with the required pressure regime for the ventilation system. Maintenance personnel resolved the issue on Tuesday night.

Emergency Management: This week, a four person team commenced a Parent Organization Functional Management Review of emergency management. The team’s scope includes review of independent and external assessments, including the Board’s draft recommendation, as well as program improvement initiatives.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 11, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending August 11, 2017

DNFSB Staff Activity: Y. Li and L. Schleicher met with LANL personnel to discuss the process for the forthcoming update to the probabilistic seismic hazards analysis, which is expected to refine, and possibly lower, the earthquake hazard for the laboratory's nuclear facilities. They also walked-down sites for paleoseismic trenching, as well as several previously studied hoodoos that will provide inputs for the seismic update.

Plutonium Facility–Startups: On Monday, the NNSA Field Office authorized the startup of aqueous chloride and americium production operations (see 6/9/17 weekly). Operations personnel plan to execute their startup plan in the coming months and complete a production milestone of americium-241 oxide for the DOE Office of Science. The line will then undergo an outage during the winter to replace a glovebox spool piece that is thought to be degraded and the source of a previous radiological uptake by a worker several years ago. The spool piece is currently taped and monitored to support interim operations. Also on Monday, the NNSA Field Office authorized startup of the mobile loading operations for TRUPACT II containers (see 7/21/17 weekly). LANL anticipates a limited shipping campaign of transuranic waste to the Waste Isolation Pilot Plant in September 2017.

Transuranic Waste Facility (TWF)–Readiness: On Wednesday, the Federal Operational Readiness Review (FORR) team completed their review. They complimented the TWF operators on their professionalism and concluded that TWF was ready to commence limited nuclear operations following closure of the pre-start findings. However, the FORR team also provided three recommendations based on the inability of TWF personnel to effectively complete several key work evolutions. The recommendations are to: modify the startup plan to limit daily throughput (likely to four drums) and require DOE approval for release of startup phases, as well as the senior supervisory watch; prohibit stacking of drums until further verification of readiness; and prohibit facility startup until further verification of readiness to adequately overpack a waste container with compromised integrity. For the latter case, the safety basis requires that a container must be overpacked within seven days after discovering damage to its integrity. The facility does not currently have a process to accomplish such overpacking in a non-emergency condition.

In addition to the recommendations, the FORR team identified five pre-start findings concerning: (1) the NNSA Field Office lacks an oversight plan for TWF startup; (2) the primary container handling procedure is inadequate; (3) the abnormal response procedure doesn't address key conditions and appropriate responses; (4) the startup plan is inadequate to ensure deliberate escalation to normal operations; and (5) procedures that manage abnormal conditions lack detailed corrective actions to achieve a safe and stable state. The team identified six post-start findings involving: (1) noncompliant fire barrier penetrations seals; (2) ineffective controls for nitrogen asphyxiation hazards; (3) inadequate commercial grade dedication; (4) lack of climate controlled storage for spare parts; (5) issues with the technical safety requirements; and (6) insufficient minimum staffing.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: Waste Characterization, Reduction, and Repackaging Facility workers have successfully treated 24 of the RNS containers, including the container with the highest radiological inventory.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 18, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending August 18, 2017

DNFSB Staff Activity: M.R. Bradisse, R.C. Eul, and N.M. George observed conduct of operations and nuclear criticality practices at the Plutonium Facility. They also observed the criticality exercise discussed below. On Friday, R.K Verhaagen completed his service with the DNFSB.

Chemistry and Metallurgy Research (CMR) Building–Safety Basis: Last Friday, LANL transmitted to the NNSA Field Office for approval a revision to a temporary safety basis associated with the storage and processing of americium-241 materials received from an off-site location in February 2016. This revision supports removing the 55 gallon drum from its overpack and subsequent installation of a drum vent. Once a definitive path forward for the americium is determined, CMR personnel will need a further safety basis revision to support opening the inner containers and processing the materials.

Transuranic Waste Management: On Thursday, the NNSA Field Office authorized startup of the mobile loading operations for TRUPACT II containers at the Plutonium Facility (see 7/21/17 weekly). LANL anticipates completing the associated safety basis implementation actions in September 2017, but will need to complete several other hurdles, including the Generator Site Technical Review (see 4/21/17 weekly), in order to commence shipping of transuranic waste containers to the Waste Isolation Pilot Plant. LANL's latest waste accumulation forecast indicates that operation of the new Transuranic Waste Facility (TWF) is required by May 2018. This projection assumes that Plutonium Facility personnel are able to ship 14 large volume, low material-at-risk containers to Area G. The EM Field Office is currently reviewing the necessary safety basis changes to receive these containers (see 7/7/17 weekly). Without the relief afforded by shipping the large containers, the Plutonium Facility will reach storage capacity in approximately November 2017. TWF project personnel are currently planning to complete the actions required to commence limited nuclear operations in September 2017.

Plutonium Facility–Safety Basis: Earlier this month, LANL transmitted to the NNSA Field Office for approval a revision to the 2014 safety basis that addresses previous comments and conditions of approval. The 2014 version of the safety basis represents a substantial overhaul as compared to the currently implemented versions and is intended to eventually become the controlling safety basis, once approved and implemented. The NNSA Field Office is developing their review plan.

Plutonium Facility–Emergency Management: On Thursday, Plutonium Facility personnel conducted their annual nuclear criticality exercise. This year's scenario featured a simulated inadvertent criticality involving an over-batched aqueous solution system coincident with an inoperable ventilation system. Additionally, two workers were exposed with one non-viable and the other requiring rescue. Evaluators and controllers will conduct their exercise critique next week.

Weapons Engineering Tritium Facility (WETF): On Thursday, the NNSA Field Office rescinded a previous condition of approval from 2013 that prohibited the receipt of new material-at-risk into the facility. WETF management recently requested this change in order to support the facility's gas transfer stewardship mission. The material-at-risk limit remains 240 g of tritium.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 25, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending August 25, 2017

Management: On Wednesday, the LANL Director announced that Scott Gibbs will serve as the Deputy Director for Mission Assurance, beginning September 5th. The role of this newly created position is to provide strategic and tactical support in the areas of contract assurance and risk management.

Plutonium Facility–Safety Basis: Subsequent to questions raised by the NNSA Facility Representatives, facility management declared a violation of the technical safety requirements (TSR) after determining the annual in-service inspection of pipe overpack containers (POCs) had been performed on a statistical sample rather than the complete inventory as required. At the fact-finding, the cognizant system engineer for containers acknowledged an error in executing the surveillance procedure and noted opportunities to eliminate future confusion. In particular, the surveillance, which covers multiple types of fire-rated containers that are credited in the safety basis to provide reduced damage ratios, permits statistical sampling for all containers except POCs and DOE-STD-3013s. Management is determining a path forward to restore TSR compliance for the approximately 700 POCs at the facility, as well as the associated implications for continuing to use a damage ratio for purposes of complying with TSR limits on material-at-risk. Additionally, attendees discussed an apparent conflict between the TSR surveillance criteria for the visual examination and language within DOE-STD-5506 that mandates use of the criteria in the payload integrity checklist for the waste acceptance criteria for the Waste Isolation Pilot Plant when reduced container damage ratios are utilized. On this point, management decided to enter the New Information process.

Plutonium Facility–Conduct of Operations: On Monday, an operator declared a potential process deviation after questioning a nuclear criticality safety posting on a glovebox slated for decontamination and demolition. Attendees at the fact-finding determined that the approved process for changing postings had not been followed.

Transuranic Liquid Waste (TLW) Project: On Wednesday, the NNSA Field Office provided LANL management with direction regarding the preliminary documented safety analysis. The direction included: revise the hazard evaluation to reflect sodium hydroxide as a standard industrial hazard; revise the hazard analysis to reflect the potential for spray leaks of acidic liquid waste; and affirm the designation of defense-in-depth for the piping system and chemical shields.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: On Tuesday, treatment activities were paused after an operator's coveralls snagged and snapped a pressure gauge assembly on a fire suppression system riser rendering the system inoperable. At the fact-finding, attendees noted appropriate responses and requested an evaluation to determine whether the assembly could be better protected, as it is located in a space-constrained location that is frequently trafficked. Maintenance personnel repaired the system on Wednesday, but noted unexpected corrosion on the broken assembly. As a result, the cognizant system engineer is investigating the need for additional intrusive inspections of the fire suppression system. On Friday, Waste Characterization, Reduction, and Repackaging Facility workers expected to complete treatment of the 30th RNS container—marking the halfway point of the campaign.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 1, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending September 1, 2017

DNFSB Staff Activity: B.K. Caleca, M.W. Dunlevy, T.J. Dwyer, D.M. Gutowski, A.R. Powers, and M.T. Wright conducted a review of the safety posture of the Plutonium Facility, including the compensatory measures and plans to remedy identified deficiencies associated with the safety systems.

Plutonium Facility–Conduct of Operations: On Tuesday, facility personnel conducted a fact-finding associated with a criticality safety event that occurred in the casting room on August 18, 2017. As discussed by attendees, the casting crew did not utilize a required use-every-time attachment to the material move procedure. As a result, the crew moved a shell into a location that already contained plutonium metal, violating the posted limit set, which allows for either metal or shells. The crew discovered this violation on August 21 while moving the shell to another location. Following discovery, the crew conducted two additional nuclear material movements that they felt were necessary for product quality and security, rather than declare a potential process deviation as required by procedure and training. They then contacted programmatic operations management for a post-job review. Notably, this casting operation had recently completed a federal readiness review and is one of the few operations where the crew that underwent readiness has not experienced personnel turnover. Additionally, this was the first shell cast in the facility in about four years and the second time that a restarted operation encountered conduct of operations issues related to the criticality safety of material movements shortly after resuming nuclear work (see 7/8/16 weekly).

On Wednesday, Plutonium Facility management briefed the NNSA Field Office on immediate actions taken, which include: conducting a formal causal analysis; pausing all casting operations; disqualifying the involved workers; requiring group leader authorization for all future moves in the casting room; mandating all group leaders observe at least three material movements; temporarily requiring a hard copy of the material move checklists for all moves; and studying longer-term improvements to the material movement process.

Plutonium Facility–Radiological Control: On Tuesday afternoon, the operations center restricted access to and suspended movement of all personnel within the facility for about two hours after radiological control technicians (RCT) found contamination on the personal protective clothing of several workers. In total, RCTs identified contamination on 11 workers associated with a job removing a limited volume chilled water supply—one worker with 1.3 k dpm alpha contamination on his knuckle and the rest with contamination on their protective clothing, mainly booties, at levels ranging from 2–10 k dpm alpha. Surveys in the affected rooms found no indications of airborne contamination; however, they revealed multiple contaminated locations, including two discarded booties found with 100 k dpm alpha. Attendees at the fact-finding identified issues with the congested and space constrained location of the job, which was adjacent to the main room exit and the hand and foot monitors. They surmised that small drops of liquid from the system, which had been previously sampled and found to be below detection levels, were actually contaminated (or became contaminated during the course of the job) and the liquid spread beyond the room as a result of the job. Management identified corrective actions associated with evaluating: the methodology for sampling liquid systems to be breached; the approach for relaxing radiological controls when breaching systems; and the design of hot job exclusion area boundaries.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 8, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending September 8, 2017

DNFSB Staff Activity: D.J. Brown, M.W. Dunlevy, and P.J. Foster held two teleconferences with NNSA Field Office personnel to discuss questions regarding the state of readiness and the technical safety requirements for the Transuranic Waste Facility.

Plutonium Facility–Safety Basis: On Thursday, the cognizant system engineer completed the required in-service inspections for the pipe overpack containers, restoring compliance with the technical safety requirements (see 8/25/17 weekly). As part of their new information process, safety basis personnel are still analyzing the potential impacts of the differences in visual examination criteria between those used to implement the existing technical safety requirements and those required by DOE-STD-5506-2007 to justify use of a reduced damage ratio.

RANT Shipping Facility: On Thursday, the NNSA Field Office approved the letter that LANL submitted on April 20, 2017, in lieu of the annual update to the safety basis. The approval reiterated that the safety basis was sufficient for operations permitted in COLD STANDBY mode, but further operations would require approval of a new safety basis developed in accordance with DOE-STD-3009-2014. Separately, LANL engineering staff recently completed a seismic retrofit design to ensure the structure will meet performance category 2 seismic criteria. Safety basis personnel have begun preliminary analyses to ensure this level of seismic performance will be adequate to support the future safety control strategy.

Area G–Safety Basis: Late last month, the EM Field Office approved a revision to the Evaluation of the Safety of the Situation concerning transuranic waste inventory discrepancies, formerly known as the composite source term issue (see 7/7/17 weekly). The approved analysis indicates the postulated accidents with the highest consequences are a large combustible fire and lightning strikes to multiple waste containers with mitigated consequences to the public of about 19 and 12 rem, respectively. Implementation of this revision will eliminate the aircraft crash accident through a reduced frequency argument, as well as support resumption of normal operations at Area G. Implementation is currently scheduled for later this month, and will be closely followed by receipt of oversized, low material-at-risk containers from the Plutonium Facility.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: On Wednesday, Waste Characterization, Reduction, and Repackaging Facility (WCRRF) management declared a violation of a Specific Administrative Control after receiving a report that a DOE-EM Headquarters overseer witnessed a lapse in required fire watch coverage during shift turnover. Specifically on Tuesday morning, the overseer noted that the required hourly entry was performed after the grace period and witnessed lapses in video monitoring, contrary to the procedure for a condition with an RNS container present outside of the refrigerator. Fact-finding attendees discussed contributing causes and corrective actions related to strengthening procedural guidance for transitions, improving conduct of operations training for the pool of laborers performing the fire watch function, and issuing a vest to the fire watch assigned to monitor the video. As of Friday, WCRRF workers were treating the 34th RNS container out of 60.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 15, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending September 15, 2017

DNFSB Staff Activity: D.J. Brown observed the follow-up demonstrations for the Federal Operational Readiness Review (FORR) at the Transuranic Waste Facility (TWF) discussed below.

Federal Oversight: On Thursday, the NNSA Field Office Manager, Kim Davis Lebak, announced her upcoming retirement from federal service. She will be succeeded by Steve Goodrum in October 2017.

Infrastructure: NNSA Headquarters personnel were at LANL this week to conduct the second deep dive associated with NNSA's Master Asset Plan. The deep dive attendees were provided presentations and tours associated with key laboratory infrastructure.

TWF–Readiness: On Monday and Tuesday, TWF operators demonstrated their ability to direct-load a simulated degraded transuranic waste drum into a standard waste box and stack three pallets of drums for a subset of the FORR team. The FORR team had previously identified that both of these activities required further federal assessment (see 8/11/2017 weekly). At their outbrief, the team again complimented the professionalism of the TWF operations personnel and noted that both tasks were successfully executed. However, they noted several opportunities to strengthen the applicable procedures and expressed concern regarding the margin for fork lift maneuvering during the stacking evolution. Project personnel designed the waste storage buildings with the intent to load them with two rows of drums on pallets, each row stacked three high. The spacing of these rows is such that the facility's current forklift has about 14 inches to maneuver into a position perpendicular to a row in order to stack a pallet. The FORR team expressed concern that this degree of margin was putting the operators in an unnecessarily difficult position and may necessitate alternate arrangements.

In parallel, TWF personnel continue to close corrective actions for the pre-start findings in support of receiving startup authorization before the end of the month. Currently, technicians are conducting a 100 percent inspection and repair of the safety class penetration fire seals, which is pacing progress. This action requires technicians to systematically work each building to catalog, relabel, inspect, and rework the penetrations as needed. When last reported, they found deficiencies requiring rework for 26 of 28 through-wall seals, including the use of incorrect materials and incomplete coverage.

Plutonium Facility–Safety Basis: On Monday, LANL management transmitted to the NNSA Field Office for information a project execution plan associated with updating key modeling used in the development of the safety basis. The plan responds to previous directed actions and aims to: (1) update the dispersion modeling using recent meteorological data; (2) revise the fire modeling using current combustible loading levels; (3) create a unified leak path factor analysis of an integrated model of the facility using MELCOR; and (4) examine the actual amounts of material-at-risk used to support programmatic operations to more accurately reflect the source-term in the accident analysis. Notably, the plan indicates uncertainty in funding and does not mention including consideration of co-located worker consequences.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 22, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D.M. Gutowski
SUBJECT: Los Alamos Report for Week Ending September 22, 2017

DNFSB Staff Activity. D. Gutowski was onsite providing resident inspector coverage.

Plutonium Facility–Safety Basis. Last week, safety basis personnel finalized their new information process analysis concerning adequacy of the visual examination criteria used during in-service inspections for the pipe overpack containers (see 8/25/2017 weekly). They concluded that the situation did not constitute a potential inadequacy of the safety analysis. Their rationale included the fact that DOE Directives do not require in-service inspections for credited design features and therefore there could be no requirement to implement criteria in DOE-STD-5506.

Plutonium Facility–Readiness. A contractor readiness assessment (RA) team commenced their review of the electrorefining process. During demonstration of breaking press operations, fragments of a surrogate material ring bypassed the shield around the press. There was no damage to the glovebox. Facility personnel are evaluating how to prevent future occurrences. The RA is expected to finish next week and will be followed by a Federal RA.

Plutonium Facility–Criticality Safety. Two detectors for the criticality accident alarm system in the basement failed the quarterly TSR surveillances test. Facility personnel entered the appropriate Limiting Condition for Operation and launched a fact-finding meeting where they discussed that the surveillance test is likely to show failures in areas with higher background radiation. The detectors passed a revised test and have been returned to service.

During a fissile material operation review, LANL personnel discovered that uranyl nitrate hexahydrate material from TA-18 did not have a current technical basis for criticality safety controls. They restricted access to the location, determined that the material was safe and stable from a criticality perspective, and are developing a recovery plan.

Area G–Safety Basis. LANL completed implementation of the revised Evaluation of the Safety of the Situation for material-at-risk discrepancies (see 9/8/2017 weekly).

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: As of Friday, Waste Characterization, Reduction, and Repackaging Facility workers were treating the 40th RNS container out of 60.

Transuranic Liquid Waste (TLW) Facility Project. In a letter dated August 24, 2017, NNSA directed LANL management to suspend the TLW project by the end of September 2017 due to a number of factors associated with budget, schedule, and competing priorities. The TLW was to fulfill a mission need for an enduring capability to process aqueous waste from the Plutonium Facility. This capability is currently performed in the 1963 vintage Radioactive Liquid Waste Treatment Facility. As directed per the suspension letter, LANL delivered an updated version of the preliminary documented safety analysis to the NNSA Field Office last Friday.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 29, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending September 29, 2017

Plutonium Facility–Conduct of Operations and Work Control: On Saturday, pipefitters released airborne radioactive material when they removed a plug from a service panel on the base of a glovebox. This was the same work crew and glovebox involved in the contamination event late last month (see 9/1/2017 weekly). At the fact-finding, attendees reviewed the scope of work which included replacing two elbows on the service panel with shorter versions. The pipefitters described difficulty in turning one of the elbows because of an interference from a plug and decided to remove the plug thereby releasing the contamination. They believed they had allowance to take such an action because the work document provided only vague constraints on “field routing.” The two pipefitters and supporting radiological control technician were wearing air purifying respirators and anti-contamination clothing, but exited the room when airborne radioactive contamination levels exceeded their safety thresholds. All three workers were contaminated on their protective clothing, including one with 100 k dpm alpha on the skin of the chest area, which was successfully decontaminated. Nasal smears were all determined to be negative and the workers were placed on special bioassay. Continuous air monitors indicated airborne levels as high as 4520 DAC-hours in the impacted room, as well as lower readings in the adjacent room and an area in the north corridor, which was also found to have areas of floor contamination. Fact-finding attendees discussed concerns and corrective actions associated with: establishing a common understanding of field routing; ensuring adequate on-call support during off-hours; and worker perceptions of increased programmatic pressure for project work.

Plutonium Facility–Safety Basis: Earlier this month, LANL management submitted to the NNSA Field Office a revision to the Evaluation of the Safety of the Situation (ESS) addressing the seismic interaction concerns for the fire suppression system (FSS). The initial ESS focused on questions regarding the seismic performance of cast iron fittings raised in the Board’s letter dated May 12, 2016. The Board’s letter also noted that LANL engineering personnel had documented concerns in 2010 with the potential for adverse seismic interactions (so-called 2 over 1 concerns) where unqualified equipment may fall or otherwise impact portions of the credited FSS. The revised ESS formally addresses this interaction issue and identifies 17 specific areas of concern within the facility, one global concern in the filter plenums, and a coupling issue present in both of the firewater pump houses. The ESS proposes maintaining the previously specified operational restrictions to reduce material-at-risk limits. The ESS further commits to implement corrective actions for the specific areas of concern through an annual revision to the TA-55 Project Execution Strategy.

Area G–Operations: On Tuesday, Area G personnel received the first shipment of newly generated transuranic waste since January 2014 when they accepted a number of oversized boxes from the Plutonium Facility. According to LANL’s projections, this shipment will extend the ability to continue accumulating waste at the Plutonium Facility’s outdoor storage pads until March 2018.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 6, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending October 6, 2017

Federal Oversight: On Thursday, Steve Goodrum became the Manager of the NNSA Field Office.

Plutonium Facility–Operations: With the start of the fiscal year, the Associate Director for Plutonium Science and Manufacturing implemented a re-organization that melds personnel from the previous engineering and operations divisions into three new organizations associated with pit technologies, actinide processing, and strategic science and engineering. Consequently, the roles and responsibilities that were learned and assessed during the restart reviews have changed.

Plutonium Facility–Restart Activities: Last Thursday, the contractor readiness assessment team briefed the results of their review of the electrorefining process (see 9/22/2017 weekly). They identified two prestart issues: (1) the criticality safety evaluation document has not demonstrated that all credible abnormal conditions associated with the potential for fissile material overmass will remain sub-critical and (2) the hazards with the movement of materials and use of gloves in the primary staging glovebox, which is a unique carousel design, were not defined in the procedure and were not appropriately demonstrated or communicated during the operation. In response to the first finding, management has paused all pyrochemistry operations.

Transuranic Waste Facility (TWF): Last week, NNSA Headquarters approved the phased startup of nuclear operations and Critical Decision-4, *Project Completion*. This accomplishment comes after several weeks of intense efforts to complete and verify corrective actions. In particular, TWF and NNSA Field Office personnel expended efforts closing the fire penetration seal issues (see 9/15/2017 weekly), which ultimately required rework for 127 of 228 seals, including some that required additional rework. TWF personnel hope to receive their first shipment of waste containers next week. In the first phase of the approved startup plan, TWF personnel may receive no more than four waste containers at one time. Progression to the subsequent phases requires TWF management to assert, and NNSA Field Office to concur, that performance supports increased throughput. Other efforts to complete the functionality for the TWF continue with: the recent submittal of a safety basis revision that supports the use a 10 % damage ratio for pipe overpack containers stored in certain locations; installation of the characterization trailers; upgrades to the fire suppression system; redesign of the seismic-shutoff switches; and transition of the workforce to a new management reporting structure.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: On Thursday, Waste Characterization, Reduction, and Repackaging Facility (WCRRF) workers completed treatment of the 45th RNS container out of 60. With the recent progress, LANL management is now projecting completion of the RNS campaign in early November. Last Thursday, the NNSA Field Office unconditionally approved a revision to the WCRRF safety basis necessary to support the treatment of the unremediated nitrate salt (UNS) wastes. While WCRRF workers will utilize a similar treatment process for the UNS, these materials do not exhibit the reactivity hazards associated with the RNS. As such, the related controls on pressure and temperature will no longer be necessary.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 13, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending October 13, 2017

Plutonium Facility–Operations: This week, programmatic operators successfully produced their first batch of americium-241 oxide. The activity used the recently authorized aqueous chloride-based solvent extraction system and the separations process known as the Chloride Extraction and Actinide Recovery (CLEAR) line. This was the first time the CLEAR line operated and the first time that the solvent extraction process has operated since 2013. During the process, operators experienced intermittent problems with a vacuum pump and briefly paused to re-evaluate controls after they encountered higher than expected radiation levels during the precipitation process.

Transuranic Waste Facility (TWF): On Wednesday, TWF operators successfully received their first shipment of four transuranic waste drums. Workers appropriately paused and consulted management after they observed two discrepancies associated with labeling: (1) the word “EMPTY” along with an individual’s contact information hand written on the bottom of one drum and (2) an unexpected label indicating the presence of beryllium in a second container. Of note, waste handlers at the Plutonium Facility observed, but did not address, these discrepancies during their pre-shipment inspection.

Area G–Safety Basis: Last Friday, LANL management submitted to the EM Field Office for approval a revision the Evaluation of the Safety of the Situation (ESS) for the continued safe storage of the Flanged Tritium Waste Containers (FTWC) that have potentially explosive headspace mixtures of oxygen and hydrogen isotopes (see 2/24/2017 weekly). The ESS revision reflects additional analysis regarding accident initiators associated with container movement, lightning, external fire, and electrostatic discharge. In particular, the latter work establishes a technical basis to support resumption of regulatory inspections of the shed containing the FTWCs, as well as other nearby activities. Additionally, the ESS presents a new mechanical failure analysis of an exploding FTWC that indicates the lid bolts will elongate resulting in a venting event without the generation of a shrapnel hazard. Consequently, LANL has proposed changing the 50 foot exclusion area to a 15 foot isolation area with a new process to evaluate proposed work activities in the vicinity of the FTWCs.

Earlier this month, LANL management submitted to the EM Field Office for approval the annual safety basis update. Consistent with the previously submitted waste strategy (see 7/7/2017 weekly), the update proposes increasing the material-at-risk limits from 39k to 64k plutonium-239 equivalent curies (PE-Ci) total with 14.5k combustible PE-Ci. The increase is intended to provide contingency space for NNSA.

Area G–Restart Activities: Last week, the EM Field Office approved the checklist plan of action associated with the contractor readiness assessment planned to support the upcoming treatment campaign for the unremediated nitrate salt (UNS) wastes. The UNS campaign will require limited Sort, Segregate, Size Reduction, and Repackaging operations in the Dome 231 PermaCon to remove the UNS materials in their drum liners from their existing degraded containers and place them into new containers suitable for shipment to the Waste Characterization, Reduction, and Repackaging Facility. The plan of action specifies review of radiation protection program, the hoisting and rigging program, and worker level of knowledge, as the remainder of the core requirements were determined to be justifiably excluded. The planned three day assessment is targeted for the end of this month.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 20, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending October 20, 2017

DNFSB Staff Activity: On Wednesday and Thursday, D.J. Brown observed the federal readiness assessment team's pre-visit for their upcoming review of plutonium electrorefining operations. J.W. Plaue attended briefings at DNFSB Headquarters. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 27, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending October 27, 2017

Plutonium Facility–Conduct of Operations: Last Thursday, Plutonium Facility management briefed the NNSA Field Office on the results of their causal analysis and associated corrective actions related to the August 17, 2017, overmass event in the casting room (see 9/1/17 weekly). The analysis concludes that the event occurred primarily due to several error precursors, lack of specific role and responsibility assignments, communications failures, and residual ambiguities in required documents. The report provides 15 recommended actions, including several associated with clarifying requirements. The corrective action plan commits to address these recommendations, as applicable, by January 12, 2018. Other corrective actions are grouped associated with improving performance accountability and communication, improving management oversight, developing and utilizing conduct of operations metrics, and enhancing conduct of training. Overall targeted completion dates range from November 6, 2017, to July 6, 2018. The NNSA Field Office is separately developing an enhanced oversight plan to ensure that their monitoring of these actions is focused and sustained.

Plutonium Facility–Safety Basis: On Monday, the NNSA Field Office approved a revision of the evaluation of the safety of the situation (ESS) concerning the presence of unrinsed cellulosic materials (i.e., cheesecloth) that may have contacted plutonium-238 and nitric acid. The revision addresses NNSA Field Office comments questioning the safety of the five containers currently residing at the facility that exceed the newly established limit of 10 g plutonium-238 (see 3/24/17 weekly). Approval of the revised ESS means that the operational restriction to ensure the five containers are stored within the facility’s confinement structure is no longer necessary.

Transuranic Waste Facility (TWF): Last Thursday, TWF management appropriately paused their planned second receipt of waste subsequent to questions from NNSA Field Office personnel regarding the implementation of the waste acceptance criteria. In particular, the safety basis assumes as an initial condition that all incoming waste complies with the current waste acceptance criteria for the Waste Isolation Pilot Plant. This initial condition is protected by a key element of a safety management program, contrary to the discussion clarifying the protection of initial conditions found in DOE-STD-3009-2014, and does not currently flow into an implementing procedure. Implementation is further challenged by the language of the key element, which refers to “hazardous constituents” rather than the specific properties that are relevant to the assumptions in the safety analysis (e.g., nuclear material content, flammable gas generation rates, incompatible materials, potential for energetic reactions, etc.). TWF personnel are currently working to define and incorporate verification of these properties into their waste receipt processes.

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: On Friday, Waste Characterization, Reduction, and Repackaging Facility workers completed treatment of the 55th RNS container out of 60. Area G personnel also executed their management self-assessment in preparation for the upcoming campaign to treat the unremediated nitrate salts (see 10/13/17 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 3, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending November 3, 2017

Inappropriately Remediated Nitrate Salt (RNS) Waste–Treatment Activities: On Friday, Waste Characterization, Reduction, and Repackaging Facility (WCRRF) personnel completed treatment of the 60th and final RNS container of the campaign. WCRRF personnel accomplished this significant milestone in a safe and deliberate manner, resulting in the elimination of a substantial hazard at the laboratory. Next week, Area G personnel plan to commence their contractor readiness assessment in support of the upcoming campaign to treat the unremediated nitrate salts.

Plutonium Facility–Conduct of Operations and Work Control: On Wednesday, Plutonium Facility management briefed NNSA Field Office personnel on the status of efforts to recover from the radiological contamination event that occurred on September 23, 2017 (see 9/29/17 weekly). The managers noted progress from the decontamination team in the affected rooms. Earlier this week, the adjacent room was released for access under restrictions that require the use of additional protective equipment and contamination surveys. They anticipate similar release of the primary room next week. Managers discussed corrective actions taken to ensure craft personnel have a consistent understanding of “field route,” as well as plans to enhance facility access training with information associated with the hazards of exposing new surfaces and accessing radiological systems. They further noted that this event had prompted the need to develop a larger standing team of personnel trained in decontamination and the acquisition of additional powered air purifying respirators. NNSA Field Office personnel questioned how corrective actions from the overmass event (see 10/27/17 weekly) had been integrated with these corrective actions from this event, as well as emphasized the need for management presence on the floor and consistency in training between operations and craft personnel.

Plutonium Facility–Startup Activities: On Wednesday, the NNSA Field Office approved the plan of action (POA) for the upcoming federal readiness assessment of electrorefining operations. Notably, the POA includes scope to evaluate the actions taken and planned to address issues identified in the contractor readiness assessment that did not rise to the level of a finding, as well as actions taken and planned to address the operational weaknesses identified during the overmass event in the casting room.

Safety Basis: On Thursday, the NNSA Field Office transmitted their close-out of comments related to the site-wide dispersion protocol. The direction maintains previous restrictions related to certain atmosphere phenomena, but allows LANL management to propose modifications on a case-by-case basis.

Weapons Engineering Tritium Facility: On Wednesday, LANL management transmitted to the NNSA Field Office for approval a safety basis addendum to support the removal of the Building 205 ventilation stack. The stack, which is 60 feet tall, has not been used in several years. The submittal addresses hazards associated with the use of a mobile crane and the associated lifting and maneuvering. The facility will continue using the Building 450 stack.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 10, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending November 10, 2017

Unremediated Nitrate Salt (UNS) Waste–Readiness Activities: On Thursday, the contractor readiness assessment (CRA) team completed their review of the UNS drum liner pulling activity at Area G. The activity involves opening and cutting away a portion of the 85 gallon drum overpack to access the inner 55 gallon drum, opening that drum, using a lifting fixture to remove the high density polyethylene liner containing the UNS waste, and placing the liner in a new 55 gallon drum. The CRA team conducted interviews, observed a demonstration of the activity, and observed an operational drill examining the response to a breach liner. During the outbrief, the CRA team noted that the operations team demonstrated elements of a strong safety culture and identified two pre-start findings associated with: (1) the critical lift plan and (2) problems regarding lighting and a ventilation fan in the Permacon.

Readiness: On Tuesday, the Joint Evaluation Team (JET) convened to determine the proposed readiness review levels for three upcoming activities. At the Plutonium Facility, the activities included the restart of a lathe associated with the Special Recovery Line and the startup of a two new gloveboxes containing coordinate measuring machines. The JET recommended management self-assessments for both activities on the basis that both were expansions of existing capabilities, since there are other lathes and measuring machines currently in operation. The expansion of capability argument has previously created debate at LANL regarding the definition of an existing capability (see 5/5/2017 weekly). The activity reviewed for the Weapons Engineering Tritium Facility involves the startup of a new process to vent the Flanged Tritium Waste Containers (FTWC) that may contain headspaces with potentially explosive mixtures of hydrogen isotopes and oxygen (see 12/16/2016 weekly). The safety basis modification to support the venting is still under development, but the process is expected to involve a critical lift to remove the FTWCs from their overpacks and installation of a custom-designed fixture to support manual venting. The JET recommended a CRA for this activity.

Emergency Management: Last week, the NNSA Field Office issued their assessment report on the technical planning basis element of LANL's emergency management program. The report notes that the overall program framework is adequate, but includes two findings concerning: (1) inadequate implementation of the chemical management program leading to inadequate identification of hazards for emergency planning and (2) Emergency Planning Hazards Analyses (EPHA) with inadequacies concerning the documentation of inputs and assumptions, sources of values used, or technical justification for input parameters. In the former case, the report cites several instances where Field Office personnel identified hazardous biological agents and chemicals within LANL facilities, including some in proximity to nuclear facilities, which were incorrectly excluded or missing from hazard surveys. In the latter case, the report provides examples of inconsistent and poorly justified atmospheric dispersion assumptions, incorrect indicators of an emergency events, and other inaccuracies in EPHAs. The Field Office requested a corrective action plan within 30 days.

Plutonium Facility–Infrastructure: In late September, craft personnel completed reinforcing the 27th roof girder with carbon-fiber. Engineering personnel subsequently decided to reinforce a 28th girder. Craft personnel expect to complete it before the end of the year. These actions strengthen the seismic safety posture of the facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 17, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending November 17, 2017

DNFSB Activity: On Tuesday, Board Member Santos called a staff member at the EM Field Office to discuss questions related to the extent of condition for a fire protection issue described in the Board's letter regarding the Transuranic Waste Facility dated November 9, 2017.

DNFSB Staff Activity: On Thursday, A.R. Powers, P.J. Migliorini, and M.T. Wright held a teleconference with the NNSA Field Office to discuss observations from the first phase of the safety posture review of the Plutonium Facility.

Transuranic Waste Management: On Tuesday, Plutonium Facility waste management personnel successfully utilized the mobile loading unit to prepare a shipment of six drums of waste from the Offsite Source Recovery Program for transport to the Waste Isolation Pilot Plant (WIPP). This represents the first shipment from LANL since WIPP resumed waste receipt operations. Last week, LANL personnel had planned on shipping a larger number of drums that included some sent to TA-55 from Area G; however, that effort was challenged with issues concerning safeguards, procedures, and unfavorable weather conditions. In particular, weather restrictions related to temperature and wind speed significantly constrain the use of the mobile loading unit in LANL's climate.

Re-establishing a reliable transuranic waste shipping capability remains essential to risk reductions activities across LANL. For example, the limited availability of safety controls for the aboveground inventory means that disposition to WIPP is the primary risk-reduction method for Area G. Similarly, LANL's forecast indicates that waste generation at the Plutonium Facility will be dominated for about the next decade by the disposition of legacy residues and contaminated equipment. LANL personnel are currently analyzing options for restoring operations at the RANT Shipping Facility or establishing an alternative capability.

Unremediated Nitrate Salt (UNS) Waste Treatment-Readiness Activities: Last Thursday, the Waste Characterization, Reduction, and Repackaging Facility (WCRRF) entered COLD STANDBY mode after the last daughter drums from the remediated nitrate salt waste treatment campaign were shipped to Area G. The mode change facilitates an ongoing outage to complete a number of maintenance activities and prepare the facility for the UNS campaign. In particular, WCRRF personnel plan to remove the large refrigerator unit and change the flasks on the water delivery system for the processing glovebox. They currently plan to commence UNS liner-pull activities and treatment at the end of this month.

Weapons Engineering Tritium Facility: Last Thursday, the NNSA Field Office directed LANL management to provide for concurrence a plan to either replace the existing Halon fire suppression system in the operations center or submit an appropriate exemption/equivalency for the system. This action should solidify a path forward for the existing system, which was downgraded from safety significant in July 2016 and is nearing its end-of-life.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 24, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending November 24, 2017

Transuranic Waste Facility (TWF)–Safety Basis: Last Tuesday, TWF safety basis personnel entered the New Information process regarding an apparent inconsistency between language in the safety basis and an element of a safety management program associated with the waste acceptance criteria. Waste receipts remain on hold after TWF management paused work when NNSA Field Office personnel raised this question last month (see 10/27/2017 weekly).

Confinement Vessel Disposition (CVD) Project: On Monday, CVD personnel received the seventh vessel for processing at the Chemistry and Metallurgy Research building, following a recent series of waste container transfers to the Plutonium Facility to lower material-at-risk. The sixth vessel was completed in mid-September and had resulted in the creation of 69 transuranic waste drums. CVD personnel anticipate completion of the seventh vessel in June 2018 with the generation of an estimated 80 transuranic waste drums. Overall project completion, including an added tenth sphere with minimal material-at-risk, remains on track for December 2019.

Unremediated Nitrate Salt (UNS) Waste Treatment: On Tuesday, the Associate Director for Nuclear and High Hazard Operations, as startup authorization authority, approved commencement of UNS liner pull activities at Area G. Area G personnel expect to begin next week, pending DOE-EM Headquarters approval of the UNS treatment procedure, as required by the corrective action plan for the radiological release event at the Waste Isolation Pilot Plant.

Plutonium Facility–Radiation Protection: Last week, radiological control technicians (RCT) reported several contamination events in the facility. In all cases, either workers detected the contamination as part of routine monitoring or continuous air monitors (CAM) alarmed as designed. Additionally, there are no indications of radiological uptakes by the involved workers. The events included: (1) three closures of the north corridor resulting from a CAM alarm and RCT surveys indicating contamination of up to 4500 dpm. RCT management believes this contamination may have migrated from the room undergoing decontamination discussed below and have strengthened confinement practices; (2) a glovebox glove breach during repackaging activities of legacy nuclear materials, which was identified by the worker during self-monitoring. Glovebox safety personnel will review the location for latent sharps and recommended glove change periodicity; (3) a worker handling previously surveyed items, proactively self-monitored and discovered contamination on his glove. RCTs determined the contamination was from a particle, but were unable to otherwise find a source in the area; and (4) a worker detected skin contamination on their hand during self-monitoring, which RCTs successfully decontaminated and determined to be a particle.

Decontamination activities continue in the room affected by the errantly breached glovebox. Since management briefed the NNSA Field Office on progress (see 10/3/2017 weekly), six CAM alarms have been reported while the room was restricted. In the coming weeks, RCT management expects to release this room and its neighbor as contamination areas. As such, workers will be required to wear additional protective clothing and receive more extensive radiological exit surveys than is typical in the facility. RCT management proactively instituted this practice in a nearby room used for Pu-238 processing after a number of contamination events occurred during the last two months.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 1, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending December 1, 2017

DNFSB Staff Activity: R.P. Arnold and P.J. Migliorini augmented oversight activities, including walk-downs of the Plutonium Facility, Chemistry and Metallurgy Research building, Area G, and the Weapons Engineering Tritium Facility.

Management: On Tuesday, the leadership of Los Alamos National Security, LLC announced that Terry Wallace will succeed Charlie McMillan as LANL Director effective beginning January 1, 2018.

Transuranic Waste Facility (TWF)–Safety Basis: On Thursday, TWF management concluded their New Information (NI) process and determined that changes are required to both the safety basis and technical safety requirements at the next annual update; however, the situation did not constitute a potential inadequacy of the safety analysis. The NI concerned an apparent inconsistency between language in the safety basis and an element of a safety management program associated with the waste acceptance criteria (see 11/24/2017 weekly). The safety function of the control in question, which protects key initial conditions in the safety analysis, is to: “prevent energetic events and runaway reactions resulting from noncompliant TRU [transuranic] waste contents, such as oxidizers, time-sensitive materials, incompatible chemicals, and oxidizer fuel mixtures.” The NI justification asserts that this function can be effectively implemented via a records check to ensure wastes to be received do not possess the hazardous waste codes for ignitability, corrosivity, or reactivity. The NI further suggests that this check is adequate to ensure that incoming wastes are approvable against the chemical properties section of the waste acceptance criteria for the Waste Isolation Pilot Plant.

Unremediated Nitrate Salt (UNS) Waste Treatment: On Wednesday, Area G operators commenced their campaign to pull the liners from the UNS containers and repackage into new 55 gallon drums. By midday Friday, they had completed 5 of the 26. Personnel at the Waste Characterization, Reduction, and Repackaging Facility continue maintenance activities, including troubleshooting a HEPA filter, in preparation for the upcoming UNS treatment activities.

Plutonium Facility–Glovebox Safety: On Tuesday, the glovebox safety program manager and a team of independent operators walked-down the glovebox involved in a recent glove breach (see 11/24/2017 weekly) and discovered a potential latent sharp. The sharp is associated with a latching mechanism used to secure external shielding to certain nuclear material containers. The latch is in a location consistent with the typical hand positioning needed to move the container in a glovebox, as well as the breach location found on the glove. They plan to issue a lessons learned and ensure that the latches are protected with tape or other materials when used inside a glovebox.

Emergency Management: On Thursday, the NNSA Field Office approved the Emergency Readiness Assurance Plan for fiscal year 2018. Goals of particular interest include: development of an all-hazards emergency management plan; establishment of a comprehensive and standardized facility preparedness program; enhancement of worker awareness of protective actions; and continued maturation of the group to improve planning, training, drills and exercises, and readiness assurance.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 8, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue
SUBJECT: Los Alamos Report for Week Ending December 8, 2017

DNFSB Staff Activity: On Tuesday, M.R. Bradisse and N.M. George held onsite discussions with LANL and NNSA Field Office personnel regarding their ongoing review of the nuclear criticality safety program at the Plutonium Facility. On Wednesday, A.R. Powers and team held a teleconference with LANL and NNSA Field Office personnel to discuss observations from the first phase of their safety posture review of the Plutonium Facility.

Emergency Management: On Thursday, LANL personnel conducted a multi-facility exercise involving the Radioactive Liquid Waste Treatment Facility (RLWTF), the Waste Characterization, Reduction, and Repackaging Facility (WCRRF), and the Technical Area (TA)-35 complex. The scenario involved a simulated leak of a one pound lecture bottle of chlorine gas in a TA-35 laboratory hood. After correctly identifying the appropriate Emergency Action Level, LANL emergency management personnel ordered shelter-in-place protective actions for four different technical areas; however, only the workers in the TA-35, RLWTF, and WCRRF participated in the exercise. Emergency management personnel have scheduled their formal critique with exercise evaluators for next Monday. Of note, this exercise represents a shift in LANL's approach to meeting the requirements for annual exercises. The new approach combines facilities with the intent of reducing the overall number of exercises to enable increased complexity, improved planning, and more thorough evaluation.

Unremediated Nitrate Salt (UNS) Waste Treatment: Area G personnel successfully pulled and repackaged the liners from 11 of the 26 UNS containers by Thursday night. They plan to complete an additional two containers on Friday. On Monday, WCRRF personnel received UNS containers in anticipation of commencing treatment activities; however, they paused work subsequent to questions from the NNSA Field Office regarding a temporary modification that had been made to the confinement ventilation system. WCRRF engineering personnel approved a temporary modification to support the use of cargo tape to adequately seal the filter plenum access doors. They had discovered that the doors were not properly sealing during filter efficiency testing conducted the previous week. On Tuesday, WCRRF management also determined that they had failed to perform a required surveillance on the ventilation system, declared the system inoperable, entered the appropriate limiting condition for operation, and returned the UNS to Area G. WCRRF management initiated a series of learning teams to review these events and plans to resume UNS treatment once the plenum seals are replaced.

Plutonium Facility–Nuclear Criticality Safety: Last Friday, LANL management proposed closure of an Evaluation of the Safety of the Situation (ESS) that resolves longstanding issues with the nuclear criticality safety evaluations for vault rooms B and I. Closure comes after facility personnel implemented revised evaluations late last month. The issues with these rooms originated in 2007 after questions were raised regarding the reliance on, and supporting certification of, boron used as a neutron poison as part of shielding materials in these rooms (see 8/31/2007 weekly). LANL personnel completed new evaluations in 2012 that did not credit the presence of boron, but then discovered a separate evaluation on the interaction between drawer and floor storage locations that assumed the presence of boron resulting in the ESS (10/19/2012 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 15, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending December 15, 2017

DNFSB Staff Activity: D.J. Brown observed the federal readiness assessment (FRA) on the electrorefining operation (ER) discussed below.

Plutonium Facility–Readiness: This week, a FRA team conducted their review of the new ER line, which consists of six gloveboxes and their associated connecting trunk line. NNSA approved the mission need for this new line in 2001 in order to replace the existing line which was transferred in 1979 from a previous facility. The review included interviews, process demonstrations, and an operational drill. At their out-brief, the FRA team noted three pre-start findings associated with: (1) inadequate seismic and static loading analyses to support the proposed operation in the primary staging glovebox; (2) procedure issues; and (3) startup plan inadequacies with the validation of equipment operability and management oversight. They also identified two post-start findings concerning the conduct of operations sustainability plan and the fire hazard evaluation.

Federal Oversight: NNSA Field Office personnel continue development of their enhanced oversight plan of the operating culture in the Plutonium Facility. The plan is intended as a companion to LANL's conduct of operations sustainment/improvement plan stemming from the overmass event that occurred on August 17, 2017 (see 10/27/2017 weekly). Notable topics of discussion included: coping with recent staffing losses, balancing the oversight and partnering roles of the new NNSA governance model, handling activity-level oversight planning given weaknesses in the facility's plan of the day processes, and assessing the significance of the fact that the sustainment initiative does not specifically address facility operations or maintenance/craftwork. Field office management intends to approve the plan in the coming weeks.

Plutonium Facility–Conduct of Operations: Early last Thursday morning, facility operators received a low temperature alarm on a ventilation intake necessitating a shutdown of a portion of the ventilation system and the transition to Mode 2. The facility returned to normal operations around mid-morning. At the fact-finding, held this Wednesday, attendees discussed concerns and identified corrective actions with the failure to appropriately react to a previous low temperature alarm, independent verification of valve lineups, and a lack of formality with call-out work.

Transuranic Waste Facility (TWF): On Thursday, TWF operators successfully received their second four-drum shipment of waste containers from the Plutonium Facility. Operators appropriately paused when they observed that the expected radiological information tags had been removed from the containers, but were able to obtain copies and verify the necessary information. Based on the success, TWF management is considering requesting NNSA concurrence to move forward to an eight drum receipt in early 2018. Last week, Plutonium Facility program and facility operations management assumed responsibility for TWF.

Unremediated Nitrate Salt (UNS) Waste Treatment: On Thursday, Waste Characterization, Reduction, and Repackaging personnel restored the operability of the ventilation system and returned the facility to OPERATIONS mode after the successful repair of the filter housing gaskets (see 12/8/2017 weekly). They subsequently received a UNS container and commenced treatment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 22, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending December 22, 2017

DNFSB Staff Activity: On Tuesday, N.M. George, P.A. Meyer, P.J. Migliorini, A.R. Powers, and M. Randby held onsite discussions with LANL and NNSA Field Office personnel. The discussions involved questions concerning the statistical methodology and associated analyses supporting the leak path factor values used in the safety basis for the Plutonium Facility.

Fire Protection: Last Monday, the NNSA Field Office conditionally approved LANL's permanent equivalency request in order to resolve conflicts among fire protection requirements for gloveboxes and similar process enclosures. The request proposed utilizing a fire hazard evaluation (FHE) process to meet requirements and expectations contained the DOE-STD-1066, International Building Code, National Fire Protection Association, and American Glovebox Society standards for establishing fire protection requirements. The request also establishes inerting systems, when properly designed and alarmed, as an equivalent alternative to fire suppression systems. The conditions of approval include mandatory use of LANL's FHE procedure, required NNSA Field Office concurrence for gloveboxes that contain a heat source without either inerting or fire suppression, and quarterly updates on FHE progress. LANL managers are currently developing a schedule to complete FHEs for all of the gloveboxes in the Plutonium Facility. While some FHEs have been developed as part of readiness, many gloveboxes without inert atmospheres await completion of FHEs and associated installation of fire suppression systems, as to be determined by evaluation.

Unremediated Nitrate Salt (UNS) Waste Treatment: Last Friday, the Associate Director for Nuclear and High Hazard Operations, as the relevant startup authorization authority, notified the EM Field Office regarding her approval to proceed with processing one UNS container without further readiness review. This container requires a liner-pull activity at Area G, but had been excluded from the contractor readiness assessment because its inventory of radioactive material exceeds the Hazard Category 2 threshold. LANL personnel applied a correction factor based on the material's dispersion properties and were able to support a revised equivalent inventory. Specifically, the UNS material is considered non-combustible/dispersible in the safety basis. LANL personnel used estimates of the mass fraction of organic material derived from real-time radiography imagery to determine an updated combustible equivalent factor of 8 percent for the UNS.

RANT Shipping Facility: On Tuesday, LANL and NNSA Field Office personnel briefed NNSA Headquarters personnel on the status of preliminary safety basis analyses meant to examine the adequacy of the proposed seismic retrofit (see 9/8/2017 weekly). The retrofit design is intended to achieve performance category 2 seismic criteria; however, preliminary safety analyses indicate this level of performance may be insufficient under some postulated scenarios. As such, LANL personnel are evaluating alternatives to achieve an enduring transuranic waste loading capability that is weather resistant. In the interim, LANL will continue to rely on mobile loading (see 11/17/2017 weekly).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 29, 2017

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue

SUBJECT: Los Alamos Report for Week Ending December 29, 2017

The Year on a Page: A summary of the key developments of 2017.

- Area G and Waste Characterization, Reduction, and Repackaging Facility personnel successfully completed their campaign to treat the inappropriately remediated nitrate salt wastes thereby eliminating a significant hazard. They have also commenced the follow-on campaign to treat the unremediated nitrate salt wastes and are on track for completion before the end of the bridge contract with DOE-EM.
- The NNSA Field Office Manager and LANL Director both announced retirements in advance of the upcoming transition of the management and operations contract. Both organizations also initiated accompanying changes in personnel and reporting structures.
- The Transuranic Waste Facility achieved operational status as a new hazard category 2 nuclear facility and began execution of their startup plan with the receipt of two, four-drum shipments. Facility personnel continue efforts to replace the seismic switches, upgrade the fire suppression system, and convert the dry pipe system from nitrogen to air.
- Plutonium Facility personnel completed readiness activities for aqueous chloride processing and americium oxide production, mobile loading of transuranic waste, and electrorefining. The pace of startups continues next year with planned readiness assessments for the new high-voltage electron beam welder, uranium part decontamination, and aqueous nitrate processing.
- Plutonium Facility management issued a new plan to improve and sustain the conduct of operations in the facility after an overmass in the casting room and two significant radiological contamination events. The NNSA Field Office is developing a companion plan.
- Plutonium Facility personnel continued to improve the safety posture of the facility, notably completing the effort to wrap 27 roof girders with carbon fiber reinforcement and increasing by 350 since March 2015 the number of certified containers in use on the first floor to better protect nuclear material. They also continue to refine their understanding of the seismic fragility and interactions issues with fire suppression system raised in the Board's letter dated May 12, 2016.
- Weapons Engineering Tritium Facility (WETF) personnel successfully shipped four tritium items to the Savannah River Site and are nearing completion of the system upgrades necessary to begin risk reduction activities associated with the bulk removal of tritium gas.
- WETF and Area G personnel continue to improve their understanding of the safety of the situation associated with the Flanged Tritium Waste Containers. In August 2016, LANL personnel determined some of these containers may be pressurized with an explosive mixture of oxygen and hydrogen isotopes. They are finalizing the process to vent the containers currently located at WETF following completion of safety basis changes and readiness.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 5, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue and D. Gutowski

SUBJECT: Los Alamos Activity Report for Week Ending January 5, 2018

D. Gutowski started his assignment at LANL.

Federal Oversight. Last month, NNSA Headquarters approved an organizational change and realignment for the local field office. The key changes include: establishing a Deputy Manager for Technical Operations; retitling the existing Deputy Manager to Business, Security, and Missions; and splitting the previous office of the Assistant Manager (AM) for Operations into an AM for Field Operations and a new AM for Nuclear Safety, Engineering, and Readiness. In addition, each AM will be assigned a deputy. Overall, this action addresses span of control concerns and returns the field office to a structure similar to several years ago. Field office management has also prioritized working qualification and hiring processes for Facility Representatives after the loss of five personnel last year.

Plutonium Facility–Infrastructure. Last month, LANL management transmitted the fiscal year 2018 (FY18) update to the TA-55 Project Execution Strategy to the NNSA Field Office. Major accomplishments from FY17 included: completing the wrapping of roof girders; seismic qualification testing of critical spares for electrical and ventilation systems; and installation of concrete pads for new generators serving the electric firewater pumps. Planned work for this year includes: development of a prioritized list of gloveboxes to undergo fire hazard evaluations; complete installation of the diesel generators and transfer switches for the electric firewater pumps; and continuing seismic qualification testing of other critical spares. Notable out-year activities include: modifications to ensure certain walls meet their intended fire barrier functions by FY21; ventilation system modification by FY22; replacement of the fire alarm system by FY23; and removal of non-seismically qualified buildings from the fire water yard main by FY24.

Plutonium Facility–Work Control. On Wednesday, Plutonium Facility personnel held a post-job review for a radiological contamination event that occurred in mid-December. During replacement of filters for glovebox service lines, a routine job survey discovered contamination on one worker's gloves and then a continuous air monitor alarmed. The maintenance personnel who were wearing respirators placed the work in a safe condition and exited. Radiological control technicians found contamination on three of the workers' protective clothing. Post-job participants identified that the isolation process did not recognize that the potential for contamination in this filter (a negative service system) differed from those replaced previously without incident (positive service systems). As such, the work package did not identify appropriate controls. Facility management intends to issue a lessons learned.

Emergency Management. On Tuesday, the NNSA Field Office approved the implementation plan for DOE Order 151.1D, *Comprehensive Emergency Management* (see 10/14/2016 weekly). NNSA Headquarters revised this order in response to the recently closed Board Recommendation 2014-1, *Emergency Preparedness and Response*. LANL's plan indicates that most requirements will be implemented by the end of fiscal year 2019, though full implementation to include updated hazard surveys and technical basis documents is anticipated by the end of fiscal year 2021. The approval letter also notes the need for NNSA Headquarters to clarify the annual exercise requirements for Defense Nuclear Facilities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 12, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski
SUBJECT: Los Alamos Activity Report for Week Ending January 12, 2018

Federal Oversight. On Wednesday, the NNSA Field Office Manager and Senior Technical Safety Advisor conducted the final qualification walk-through for the senior Facility Representative at the Plutonium Facility. They noted the candidate's exceptional performance. This action brings the total of fully qualified NNSA Facility Representatives up to two.

Plutonium Facility–Work Control. On Monday, Plutonium Facility personnel conducted a post-job review after craft workers heard an unusual whistling noise and identified unexpected breaches in the confinement for an existing glovebox undergoing refurbishment. The breaches were associated with improperly sealed penetrations; however, in this case, radioactive contamination did not migrate from the glovebox. Post-job personnel and facility management determined the need to develop a process to ensure confinement integrity is appropriately maintained and controlled as new gloveboxes and associated components are connected to existing contaminated systems. Management also directed the review of installation activities currently underway for the need to implement compensatory measures while the new confinement integrity process is developed.

Plutonium Facility–Safety Basis. LANL prepared a new Project Execution Plan describing the approach to consolidate legacy safety basis items for the Plutonium Facility into a single DOE-STD-3009-94 compliant Documented Safety Analysis and Technical Safety Requirements. This supersedes a previous plan (see 2/24/2017 weekly) that projected a consolidated safety basis in August 2017. The new plan projects submittal of a consolidated safety basis to the NNSA Field Office in August 2018 with approval in October 2018.

Transuranic Waste Facility (TWF). On Thursday, TWF personnel successfully completed their third receipt of four waste containers from the Plutonium Facility. TWF management had previously requested concurrence to proceed with an eight container receipt in accordance with the second phase of their startup plan; however, NNSA Headquarters denied concurrence based on concerns with oversight and corrective action related documentation.

RANT Shipping Facility. Last month, LANL completed an analysis of alternatives to ensure a long term capability for shipping transuranic waste offsite as the RANT facility remains in cold standby due to seismic concerns (see 12/19/2014 weekly). They analyzed five options including seismic upgrades to RANT, a replacement for RANT, a new covered loading structure, and accepting the risk of using RANT in its current condition. The alternatives analysis concluded that the best overall option was to accept RANT in its current condition. The NNSA Field Office is evaluating this recommendation.

Unremediated Nitrate Salt Waste Treatment. Last week, Area G personnel completed the remaining five drum liner pulls. Personnel at the Waste Characterization, Reduction, and Repackaging Facility completed the sixth out of twenty-seven drums this week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 19, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski
SUBJECT: Los Alamos Activity Report for Week Ending January 19, 2018

Federal Oversight. NNSA provided the LANL contractor with the fiscal year 2017 Performance Evaluation Report. The report notes successes in areas such as treatment of remediated nitrate salt waste, stockpile modernization, and restart of activities at the Plutonium Facility. Performance weaknesses included issues with procedure compliance, a negative trend in the source of reporting for criticality safety infractions, and a disconnect between causal analyses and corrective actions.

At the direction of NNSA Headquarters, the NNSA Field Office Manager, the Deputy Manager for Technical Operations, and the Assistant Manager for Mission Assurance and Infrastructure recently opened second offices in the LANL contractor's main administration building. The intent of the move is to improve partnering with the LANL contractor; however, field office management is mindful of the need to continue a strong presence with the federal staff in support of their oversight role.

Plutonium Facility–Equipment Deactivation. Last Wednesday, Plutonium Facility personnel attempted to transfer about 60 liters of a legacy nitric acid solution with a low plutonium concentration out of tanks in a glovebox slated for removal. This material was not drained and flushed following completion of programmatic activities in this room more than ten years ago. The transfer did not arrive at the receiving tank, and the majority of the material remains held-up in the transfer line. Facility personnel believe that the most likely problem was insufficient vacuum to lift the dense solution into the receiving tanks. This Thursday, they started evaluating options for recovery. Vacuum systems and water addition capability were removed from this area prior to the attempt at draining the solution making recovery more challenging. DOE guidance on deactivation and decommissioning processes notes that support and utility systems should remain in operating condition if they may be required during the disposition phase.

Transuranic Waste Facility–Safety Basis. Last month, LANL management submitted to the NNSA Field Office a project execution plan for the reclassification of the fire suppression system (FSS) to safety significant. The plan responds to a condition of approval that requires the submission of a safety basis change to support the reclassifying the FSS within six months of the start of operations. Additionally, the NNSA Cognizant Secretarial Officer caveated his previous approval with the intent to re-evaluate approval if the safety significant FSS was not fully implemented by February 28, 2018. The plan's schedule indicates a period of comment iteration with the NNSA Field Office beginning in February with approval projected for April 26 and subsequent implementation on July 26, 2018. On Thursday, the NNSA Field Office Manager approved the safety basis review plan for this submittal. Notably, the review plan includes the participation of three personnel from external NNSA entities. This safety basis submission has the potential to address many of the concerns communicated in the Board's letter dated November 9, 2017.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 19, 2018

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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 26, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski
SUBJECT: Los Alamos Activity Report for Week Ending January 26, 2018

Plutonium Facility–Conduct of Operations. Last week, Plutonium Facility personnel entered the appropriate limiting condition for operations after they were informed that they had potentially exceeded the material-at-risk limit for the radiography tunnel. Workers removed a non-credited tantalum can containing a non-certified heat-source plutonium component from a certified container. Once removed from the certified container, the material no longer benefited from the reduced damage ratio and they exceeded the material-at-risk limit for the area. Operators returned the can with the component to the certified container in about an hour after acknowledging the error. During the fact-finding, management noted that special attention should be paid to non-standard configurations. They also restricted radiography of non-standard configurations of heat-source plutonium.

Plutonium Facility–Nuclear Criticality Safety. On Tuesday, Plutonium Facility personnel conducted a fact-finding for a potential process deviation concerning a High Reactivity Unit (HRU). Criticality safety engineers use the HRU term for fissionable material items that are intended as part of a nuclear explosive, but do not meet the requirements of their defined term Pu in Pit. HRUs require specific authorization prior to movement and a unique item description code in the safeguards database. While planning a future work activity, workers noted the presence of a HRU that was incorrectly coded in the database and was not covered in the criticality safety posting. In this case, the posting was generated prior to the origin of the HRU term and the unit appears to have been missed during the initial HRU coding roll-out. Fact-finding participants determined the need to perform an extent of condition and strengthen training regarding HRUs.

Plutonium Facility–Equipment Deactivation. Plutonium Facility personnel are moving forward with plans to remove the solution that became stuck in a transfer line (see 1/19/2018 report). They are adjusting the valve lineup for the vacuum transfer system with the intent of providing more motive force to move the solution out of the transfer line. NNSA Field Office senior management walked-down the sending and receiving process rooms, as well as the transfer line with Plutonium Facility management. During the walk-down, NNSA Field Office personnel suggested the need for additional sampling of the solution. Subsequently, Plutonium Facility personnel plan to take samples to augment their characterization, which is based on process knowledge and sample data taken last summer. They plan on reattempting the vacuum transfer with a new valve lineup prior to receiving the new sample data.

Area G–Safety Basis. On Monday, the EM Field Office transmitted to LANL management comments related to the revised Evaluation of the Safety of the Situation (ESS) for the continued safe storage of the Flanged Tritium Waste Containers that have potentially explosive headspace mixtures of oxygen and hydrogen isotopes (see 10/13/2017 report). They requested a resubmittal of the ESS that address the comments at their earliest convenience.

Environmental Management. On Wednesday, the EM Field Office notified their new contractor, Newport News Nuclear BWXT-Los Alamos, to proceed with transition activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 2, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski
SUBJECT: Los Alamos Activity Report for Week Ending February 2, 2018

DNFSB Staff Activity. Members of the Board's staff held a closeout teleconference with NNSA Field Office and LANL personnel to provide the staff's observations from their review of the leak path factor modeling used in the Plutonium Facility safety basis (see 12/22/2017 report).

Plutonium Facility–Equipment Deactivation. Plutonium Facility personnel were able to adjust the valve lineup to improve vacuum and complete the solution transfer that had been stuck in the line for more than two weeks. The exact volume transferred has not been determined due to uncertainty in the original volume and uncalibrated tanks on the receiving side. They plan to flush the line with water in the near future. Since water utilities were removed from the sending location, they plan to bring small bottles of water into the glovebox to supply flush water. The next step is to conduct a limited scope campaign to cement this solution along with other legacy solutions that have accumulated since the 2013 pause. They expect to conduct this campaign under a special allowance, since it will likely occur prior to completing formal restart.

Plutonium Facility–Conduct of Operations. On Monday, Plutonium Facility personnel conducted a fact-finding after a craft worker entered an airborne radioactivity area without filters installed in his powered air-purifying respirator (PAPR). While there were no indications of an uptake, fact-finding participants noted that the work crew would benefit from a checklist to ensure proper use of equipment rather than exclusively relying on their training. They also noted that this was the worker's first hot job and would have benefited from additional experience in less hazardous environments. The maintenance supervisor paused PAPR jobs until a learning team is completed.

Unremediated Nitrate Salt (UNS) Waste Treatment. On Monday evening, while leaving the facility for the day, a Waste Characterization, Reduction, and Repackaging Facility (WCRRF) operator alarmed the personal contamination monitor. The responding radiological control technicians identified alpha contamination on the skin of the operator's forearm at levels of about 17 k dpm. They commenced decontamination activities and worked with the operations center staff to transfer the individual to LANL's Occupational Medicine (OccMed) clinic, where he was successfully decontaminated and released without restrictions. At the fact-finding, operations center personnel noted difficulty reaching the after-hours on-call OccMed provider delaying the response. Ultimately, the operations center supervisor was able to reach an OccMed supervisor who was able to initiate preparations for their response. Fact-finding participants determined the need for a learning team to review the communications difficulty, which they currently believe was related to cell phone connectivity at the on-call provider's home. WCRRF personnel also subsequently determined that the contamination resulted from a breached glovebox glove. As of Thursday evening, WCRRF operators completed processing of 16 of 27 UNS containers.

Transuranic Waste Facility (TWF). TWF management received NNSA approval to proceed with phase 2 of their startup plan. Accordingly, they successfully received a shipment of eight containers during a roughly six hour evolution on Wednesday. TWF operators and management continue to refine their conduct of operations in order to ensure safe and efficient work accomplishment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 9, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue and D. Gutowski

SUBJECT: Los Alamos Activity Report for Week Ending February 9, 2018

Federal Oversight. On Tuesday, the NNSA Field Office issued their enhanced oversight plan and conduct of operations implementation plan for the Plutonium Facility (see 12/15/2017 report). The oversight plan includes use of field office personnel augmented by resources from the NNSA Office of the Deputy Associate Administrator for Safety to increase field oversight to assure the contractor's sustained operational compliance with their conduct of operations manual. The initial focus area is an assessment of implementation of controls and conduct of operations. The implementation plan specifies that federal oversight will be coordinated through one of the Facility Representatives and includes templates for expected deliverables from oversight personnel.

Fire Protection. On Monday, Sigma Complex workers removed a burr from a recently cut piece of depleted uranium metal to prevent injury; however, it sparked and ignited two rags wetted with acetone. They quickly placed the rags into a nearby plastic bucket used to collect chips and extinguished the fire with staged graphite, preventing further involvement of uranium materials. No injuries and no contamination resulted from the event. Notably, this was the same operation that experienced a small chip fire last year (see 5/12/2017 report) and corrective actions were completed, including an improved work control document that a fire protection engineer reviewed due to the anticipated frequency of fires involving pyrophoric materials. However, at a follow-up discussion requested by the NNSA Field Office, LANL personnel acknowledged the need to clarify expectations for reporting extinguished fires—in this case, the workers' supervisor contacted the emergency operations center, but the fire department was not dispatched to check the scene as intended.

Plutonium Facility–Risk Reduction Activities. LANL personnel briefed NNSA Headquarters managers on progress with the Materials Recovery and Recycle program. Achievements included processing 33 items from the vault, developing a tool to facilitate safer disposition of metallographic mounts, and processing of 26 liters of bottled solutions under a safe and stable campaign to eliminate a criticality infraction associated with the electrolytic decontamination system. They also reviewed options to support the future of the Special Recovery Line, which provides a unique capability for the weapons complex (see 3/21/2014 report).

Emergency Management. Last month, the NNSA Field Office established a formal watch bill for the federal officials that may be needed to support an emergency response. LANL emergency management personnel are still assessing the need for a formal watch bill.

Safety Basis. LANL safety basis personnel informed the NNSA field office that they intend to adjust the timing of annual updates for safety bases. Instead of submitting annual updates one year after the last submittal, they plan to submit them one year after the date of NNSA approval.

Weapons Engineering Tritium Facility (WETF). Last week, WETF safety basis personnel entered the New Information process due to a question as to whether clips on a seismic rack have a safety function to retain containers.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 16, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue and D. Gutowski

SUBJECT: Los Alamos Activity Report for Week Ending February 16, 2018

DNFSB Activity. NNSA Field Office senior staff reported that they held a phone discussion with Board Member Santos regarding restart of electrorefining operations in the Plutonium Facility.

Transuranic Waste Facility (TWF). On Monday, TWF managers briefed the NNSA Field Office on the number of containers available for shipment from the Plutonium Facility. TWF managers indicated there are currently 351 eligible standard 55-gallon drums after accounting for state regulatory restrictions and a prohibition on pipe overpack containers. In response to questions associated with compliance with the current waste acceptance criteria (WAC) for the Waste Isolation Pilot Plant (WIPP), which is required by an element of a safety management program, TWF managers expressed confidence that each of these containers would likely meet the new WAC; however, they indicated that none of the containers had completed the new elements of the WIPP WAC. The new elements of the WIPP WAC include the Generator Site Technical Review, the basis of knowledge review, and a chemical compatibility evaluation—all corrective actions to prevent recurrence of the energetic event that resulted in the WIPP radiological release event. This is important because the approved safety basis notes that the unmitigated consequences from a WIPP-like event, in the absence of new DOE direction, could be two to three orders of magnitude higher than currently analyzed. On Wednesday, TWF safety basis personnel entered their New Information process on this issue for a second time (see 12/1/2017 weekly).

Chemistry and Metallurgy Research Building. A contractor readiness assessment team completed their review of the drum venting and overpacking operation for the americium-241 materials previously received from an offsite commercial vendor (see 8/18/2017 weekly). At their outbrief, the team identified three pre-start findings associated with: (1) radiological dose tracking for a lifting sling; (2) subject matter expert review of the procedure changes; and (3) implementation of a safety basis control in the procedure. The team also raised significant concerns regarding procedural adequacy, conduct of operations, and resolution of previously identified issues. They linked these concerns to human performance error precursors and weaknesses in institutional programs.

Radioactive Laboratory Utility Office Building (RLUOB). The contractor submitted a revised Safety Design Strategy for upgrading RLUOB from a radiological facility to a hazard category-3 nuclear facility to the NNSA Field Office for review and approval (see 4/17/2015 weekly). The proposed strategy relies on a Specific Administrative Control to keep the material-at-risk inventory in the facility at a level that ensures offsite and collocated worker consequences are well below the threshold for additional controls. The strategy also includes engineered and administrative defense-in-depth controls including the fire protection system, ventilation system, and building structural design.

Plutonium Facility–Infrastructure. Plutonium Facility personnel started the tie-in of the new safety-significant Uninterruptable Power Supply. The NNSA Field Office approved a temporary safety basis modification that accommodates the interim configuration during the transition from the existing to the replacement system. This modification allows the system to be inoperable for a period of time during the final tie-in. Final connection activities are being performed while the facility is in standby mode.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 23, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski
SUBJECT: Los Alamos Activity Report for Week Ending February 23, 2018

DNFSB Activity. Acting Chairman Hamilton and staff members Herrera and Migliorini visited the laboratory on Wednesday and Thursday. They received briefings on improvements to the emergency management program; safety posture and conduct of operations at the Plutonium Facility; and activities at the NNSA and EM Field Offices. They also walked-down multiple facilities, including the Plutonium Facility.

Safety Basis. On Thursday, the NNSA Field Office formally requested that the LANL contractor develop a strategy including milestones and the resources required to upgrade the safety bases to achieve compliance with DOE-STD-3009-2014 for the Plutonium Facility, Transuranic Waste Facility, RANT Shipping Facility, and Weapons Engineering Tritium Facility. This represents a positive step toward developing high quality safety bases and implementing previous contract requirements (see 10/14/2016 weekly) in advance of the upcoming change in LANL contractors.

Plutonium Facility–Restart Activities. On Thursday, the NNSA Field Office Manager approved startup authorization for electrorefining operations. His approval comes after a line management review team completed their assessment and briefed him on the adequacy of actions taken to resolve the pre-start findings and the actions planned for the post-start findings (see 12/15/2017 weekly).

Plutonium Facility–Infrastructure. During final tie-in of the new Uninterruptable Power Supply (UPS) last weekend (see 2/16/2018 weekly), one programmable logic controller and two communications links supporting the facility control system did not return to service following testing. Facility personnel entered the limiting condition for operation for the criticality alarm system due to inoperability of the UPS. They replaced the communications links and are using a redundant programmable logic controller. On Thursday, they successfully completed a two-hour load test and declared the new UPS to be operable.

Plutonium Facility–Radiological Safety. On Tuesday, a glovebox worker detected contamination on their personal protective gloves upon exiting the glovebox gloves. Radiological control technicians reported 73,000 dpm alpha contamination on the individual's finger. Decontamination efforts were successful and nasal smears were negative. At the fact-finding, participants noted the need to develop a tool to eliminate a potential latent sharp associated with a scouring pad.

Waste Characterization Reduction Repackaging Facility (WCRRF). Last week, workers observed water dripping from the glovebox bag off stub. A radiological control technician determined the water was contaminated and found contamination on the protective clothing of two glovebox workers. All personnel successfully cleared contamination monitors following doffing. As a corrective action, WCRRF management has eliminated water misting to control dust during bagging operations as it appears the water is collecting. This is consistent with practice at the Plutonium Facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 2, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue and D. Gutowski

SUBJECT: Los Alamos Activity Report for Week Ending March 2, 2018

Plutonium Facility–Safety Basis. On Wednesday, Plutonium Facility management declared a potential inadequacy of the safety analysis related to the unanalyzed storage of plutonium-238 feed materials in a basement safe. Programmatic personnel had stored about 80 units of this material in a safe for about two months beginning on March 15, 2017. Shortly after the units were removed, safety basis personnel raised a potential issue about the practice and initiated their safety basis change review process. As part of that review, they identified issues regarding thermal loading and the adequacy of the safety basis description, and entered their New Information process last Tuesday. At the fact-finding, participants raised questions regarding procedural coverage for material movements and unreviewed safety question screening for new equipment installations; confusion with the terms “staging” and “storage” between the safety basis and safeguards documents; and the availability of storage space for future shipments. Facility management has restricted storage of these materials in safes via the shift orders.

Plutonium Facility–Work Planning. On Wednesday, Plutonium Facility personnel held a fact-finding after a craft worker received a puncture wound while kneeling in a high contamination area. Participants noted appropriate response to the injury, which was found to have no detectable radioactivity. However, management noted the need to strengthen the processes used to protect against sharps hazards in high contamination areas. In particular, they noted that the sharps expert needs to observe the work area and the workers need to enhanced rigor for placing equipment and debris.

Emergency Management. On Wednesday, emergency management personnel conducted a quarterly exercise in Areas G and L of TA-54. The scenario involved an ammonia release from a container in Area L and worker injuries. During the formal critique, the evaluators noted opportunities for improvement with emergency notifications. Not all notifications to TA-54 personnel included details such as the location or nature of the release to support immediate protective actions. There were also instances where workers did not receive notifications from the multiple forms of communications in use. These are longstanding issues as noted in the Board’s letter dated October 11, 2017. The NNSA Field Office used four outside evaluators to observe this exercise as part of an assessment.

Transuranic Waste Facility (TWF). On Monday, TWF personnel held a post-job to review practices after a piece of scaffolding fell and damaged the insulation on the firewater tank. The tank wall was not damaged and facility personnel are working with the vendor to obtain a repair kit. The tank is currently credited as defense in depth, but the NNSA Field Office has directed the fire protection system to be upgraded to safety-significant. The scaffolding was supporting a job to replace the tank level switch, as the original is not properly rated for outdoor usage. Post-job personnel noted the need to ensure the appropriate number of craft personnel for the job.

Weapons Engineering Tritium Facility–Safety Basis. The NNSA Field Office approved the safety basis amendment to allow removal of an unused exhaust stack (see 11/3/2017 report). Removal eliminates the hazard of the stack falling onto the facility. The safety basis change includes a new specific administrative control for a critical lift plan to reduce the likelihood of the mobile crane from impacting the facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 9, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski
SUBJECT: Los Alamos Activity Report for Week Ending March 9, 2018

Transuranic Waste Facility (TWF). On Wednesday, TWF management declared a potential inadequacy of the safety analysis (PISA) regarding the version of the waste acceptance criteria (WAC) for the Waste Isolation Pilot Plant (WIPP) used to implement the TWF safety basis. The TWF safety basis requires that all incoming waste meet the current version of the WIPP WAC. The WIPP WAC was last updated in July 2016 to include corrective actions from the radiological release event; however, LANL did not incorporate this revision until August 2017 and had not fully implemented it in the procedures used to package waste for TWF. During the fact-finding, participants noted that questions regarding the WAC were prevalent during the safety basis development phase of the project and re-emerged after the first waste receipt last October (see 10/27/17 report) leading to two entries into the New Information process (see 2/16/2018 report) prior to declaration of this PISA. Participants concluded that the current inventory of 28 drums is safe due to their belief in the rigor of existing waste management practices. TWF management suspended further waste receipts and structured a path forward to develop an Evaluation of the Safety of the Situation/Justification for Continued Operations that decouples the TWF safety basis from the WIPP WAC, but preserves the technical criteria necessary to ensure that energetic events and runaway reactions are appropriately prevented.

Plutonium Facility–Conduct of Operations. Programmatic operations personnel completed their first run of the new electrorefining line (see 2/23/2018 report). Their oversight team noted no conduct of operations issues, though the run was unsuccessful due to a crucible failure. On Friday, Plutonium Facility management issued their first monthly report on conduct of operations. The report summarizes adverse trends, highlights noteworthy practices, provides a conops culture scorecard, and lists focus areas for next month’s management observations.

Plutonium Facility–Criticality Safety. Last Thursday, a manager performing routine oversight questioned a work team regarding several samples that were placed within a hemishell. The Criticality Safety Posting for this operation prohibits staging of fissile material within hemishells. The team exited the room until criticality safety personnel concluded the configuration was safe and placed the box out of service. At the fact-finding, it became clear that this was another situation where facility personnel were caught in the error trap of the differing definitions of “staging” and “storage” (see 3/2/2018 weekly).

Waste Characterization Reduction and Repackaging Facility. Last week, facility personnel discovered contamination associated with degrading caulking on the underside of the glovebox. They concluded that while the caulk was a discrepant condition, it did not serve a confinement function, which was instead provided by a seal weld within the glovebox. Personnel performed a visual in-service inspection of this weld and concluded it was adequate. However, direct observation of this particular location is challenging and further hindered by residue that obscured the weld. Facility personnel have increased their radiological survey frequency of this location as an additional measure to verify confinement.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 16, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 16, 2018

Transuranic Waste Facility (TWF): On Wednesday, TWF management transmitted an evaluation of the safety of the situation (ESS) on the questions concerning the waste acceptance criteria (WAC) for the Waste Isolation Pilot Plant (WIPP) used to implement the TWF safety basis (see 3/9/2018 report). The ESS concludes that the current inventory of 28 drums is safe based on a review by subject matter experts. The ESS also proposes resuming operations under redefined language for the shipping and receiving safety management program. The proposed language notes that TWF can only receive transuranic waste that is generated by trained and qualified personnel and has an active waste stream profile that is included in an approved acceptable knowledge report. This language replaces previous language linked to the current WIPP WAC. The NNSA Field Office is currently reviewing the ESS.

Plutonium Facility–Process Improvement: Heat source plutonium operations generate liquid waste, which is accumulated in plastic carboys until it is processed. Currently, Plutonium Facility personnel use a rotary tool to size reduce these plastic containers in order to improve their packing efficiency in pipe overpack containers for disposal. On Wednesday, Plutonium Facility personnel demonstrated a new oscillating tool as part of an effort to reduce the potential for sharps injuries during this size reduction activity. They demonstrated that the oscillating tool was incapable of cutting the protective over gloves proposed for the activity. Longer term, management has notions to eliminate the use of the carboys by establishing a glovebox with the appropriate fixed vessels for the waste processing activity. Facility personnel are also establishing the means to more readily use standard waste boxes, which might provide a viable avenue for direct disposal of the carboys without size reduction.

Plutonium Facility–Safety Basis: On Thursday, the NNSA Field Office approved the second revision of the ESS for seismic interaction concerns with the fire suppression system (see 9/29/2017 report). The ESS will remain in place until August 31, 2019, which is the schedule associated with implementing a safety basis revision that includes the content of this ESS. To compensate for the seismic vulnerability, the ESS continues to include lower material-at-risk limits.

Plutonium Facility–Nuclear Criticality Safety: Last week, a restroom faucet malfunctioned, which overflowed into an area on the first floor near the aqueous processing rooms. A few gallons of water subsequently leaked into the basement in an area used to store transuranic waste drums. NNSA Field Office personnel are examining whether this result challenges assumptions related to spills of fissile solutions from the first floor and into the basement where large volume geometries are currently uncontrolled.

Waste Characterization Reduction and Repackaging Facility: On Tuesday, facility personnel completed processing the 27th and last unremediated nitrate salt drum. The next day, they processed two additional miscellaneous drums. The facility entered a maintenance outage ahead of the next planned mission to clean residues out of unremediated nitrate salt parent drums. On Wednesday, the NNSA Field office approved the safety basis revision supporting this mission.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 23, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 23, 2018

DNFSB Staff Activity: P. Foster was at Los Alamos for resident inspector training for a detail at another DOE site.

Area G–Safety Basis: Last week, a subcontractor to the EM Field Office submitted a draft safety basis for review and approval. This new Documented Safety Analysis (DSA) will eventually be given to the operating contractor to replace the existing Basis for Interim Operations reflecting the acknowledgement that operations are likely to continue for more than five years. The new DSA also represents the first safety basis at LANL developed in compliance with DOE-STD-3009-2014. Notably, the draft DSA includes several proposed engineered controls that are not currently credited in the existing safety basis, including storage structures, enclosures, ventilation systems, and fire suppression systems.

Nuclear Criticality Safety: On Wednesday, the division leader briefed the NNSA Field Office on ongoing program improvements. He indicated that since October 2016, the division staff has remedied deficient technical basis documents for 54 fissionable material operations, leaving 236 in the backlog with a goal to remedy 60 this fiscal year. He also noted that the division has reduced the number of infractions that have been open longer than a year to eight with a plan to resolve them by the end of the fiscal year. Of particular interest, he stated that staffing of criticality safety analysts is at an all-time high with 11 analysts fully qualified and 10 in qualification. He also noted better than expected progress establishing an analyst pipeline program with several universities and issuing standard criticality safety requirement evaluations that should expedite remedy of the technical basis document backlog.

Plutonium Facility–Conduct of Operations: Plutonium facility personnel moved a pit into a glovebox that is not authorized to contain that material form in the criticality safety posting. There was no other fissile material in the box. Introducing a disallowed item is an analyzed credible upset condition in the criticality safety evaluation for the box. Facility personnel have restricted access to the box and are developing a recovery plan and other corrective actions.

Plutonium Facility–Transuranic Waste Operations: On Tuesday, the NNSA Field Office approved a safety basis change that allows use of standard waste boxes as an acceptable waste container. Once fully implemented, this should provide program and maintenance workers with an alternative that minimizes the need for size reduction of contaminated equipment.

Chemistry and Metallurgy Research Building: An exit monitor discovered contamination on the fingers of a worker who had been performing decontamination and decommissioning activities. The worker was decontaminated, nasal smears had no detectable activity, and a bioassay will be performed. At the fact-finding meeting, participants noted that work continued as radiological surveys detected increasing levels of contamination which exceeded limits in the radiological work permit. Management suspended this job pending replanning and is developing lessons learned to reinforce the importance of checking the condition of personal protective equipment and staying within the bounds of one's radiological work permit.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 30, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 30, 2018

Plutonium Facility–Conduct of Operations: Last Friday, in response to recent process deviations (see 3/23/2018 and 3/9/2018 reports), the Pit Technologies Division management proactively paused all of their operations involving special nuclear materials. They developed a criteria and review approach document to assess all of their operations through plant walk-downs and discussions with fissile material handlers. The assessment evaluated three areas: compliance and usability of the criticality safety postings; worker engagement and understanding; and best practices and areas of improvement from the perspective of the “voice of the worker.” Notably, management required that personnel independent of specific operations participate in the assessment to ensure objective evaluation. Pit Technologies management completed their review on Wednesday and resumed the majority of their 93 fissile material operations on Thursday after receiving concurrence from the Responsible Associate Director. Seven operations remain restricted, including newly discovered potential process deviations concerning two operations with posting compliance issues and a third operation that needs to implement a new posting. The seven operations will be released individually once the issues are resolved. Additionally, management is developing a remediation process for the workers involved in last week’s inappropriate pit movement.

Plutonium Facility–Nuclear Criticality Safety: On Thursday, Plutonium Facility personnel conducted a fact-finding after nuclear criticality safety personnel noted that language in a criticality safety posting had drifted from the technical basis resulting in a potential process deviation. Specifically, the technical basis originally supported a limit of “dry Pu in a SNMC (special nuclear material container),” that had been changed via a level 2 memo to “Pu in waste;” however, the underlying assumptions on the presence of moderating materials for these defined terms are different. The affected locations are currently posted out-of-service and deemed safe. Management took an action to review other level 2 memos, as well as review the response to a potential process deviation for occasions when it is initiated away from the work location.

Federal Oversight: On Thursday, NNSA Field Office personnel conducted a walk-down of the Plutonium Facility as part of their enhanced oversight plan (see 2/9/2018 report). This walk-down focused on the accuracy of the plan of the day. An accurate plan of the day is necessary to ensure work activities are authorized, conflicting work is precluded, and supporting resources are available. An accurate plan of the day can also be a useful tool for laboratory management and NNSA oversight personnel to effectively plan work observations necessary to strengthen conduct of operations. During this walk-down, NNSA Field Office personnel observed instances of work being performed that was not on the plan of the day. They also noted that the operations center staff demonstrated an inconsistent level of awareness between ongoing programmatic, maintenance, and construction activities. They plan to discuss these observations with LANL management during their periodic enhanced oversight briefings.

Weapons Engineering Tritium Facility: Last week, one of the safety-significant room tritium monitors failed when water entered the system. The monitor has been replaced, and facility management is evaluating why water collected and overwhelmed a drier system.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 6, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending April 6, 2018

The Resident Inspectors were at DNFSB headquarters this week. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 13, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 13, 2018

Confinement Vessel Disposition (CVD) Project: On Wednesday, CVD personnel discovered that daughter transuranic waste drums were being moved to a low dose area for non-destructive assay that was not covered in the criticality safety evaluation document. About 65 of these material moves occurred since February 2018. Facility management has a number of planned corrective actions including revising procedures to perform assays in an approved location and revising the criticality safety evaluation to include the new location.

Plutonium Facility–Work Control: A worker manipulated potentially energized 120 V wires without the required energized electrical work permit. Subsequent locking of the breaker was unsuccessful due to an ineffective locking device. Work continued with the breaker tagged, but not locked. At the fact-finding meeting held on Tuesday, participants noted that laboratory management had previously eliminated periodic retraining on lockout/tagout against the advice of subject matter experts. Lockout/tagout program personnel noted that they are revisiting their policy to address known worker confusion between hazardous energy isolation and system configuration control in advance of about two thirds of the program users requiring retraining by November 2018 per the current national consensus standard.

Plutonium Facility–Safety Basis: Last Friday, safety basis personnel provided the NNSA Field Office with an Evaluation of the Safety of the Situation (ESS) for storage of heat source plutonium in safes (see 3/2/2018 report). There are no additional compensatory measures, since the material was already removed. Analysis supporting storage in these safes was outside of the scope of this ESS so they remain an unauthorized storage location.

Safety Basis: Last week, LANL management responded to the NNSA Field Office with their tentative plan and schedule for achieving DOE-STD-3009-2014 compliant safety bases (see 2/23/2018 report). The proposal includes a submittal next month of a DOE-STD-3009-2014 compliant safety basis for the Radiological Laboratory Utility Office Building upgrade to a hazard category 3 nuclear facility. For the Plutonium Facility, the strategy is to: approve a unified safety basis by October 2018; update the unified version with new material-at-risk values, as well as new leak path factor and atmospheric dispersion modeling in October 2019; and ultimately submit a DOE-STD-3009-2014 compliant safety basis in October 2024. The other nuclear facilities are serially staggered between these time frames.

Federal Oversight: Last week, the NNSA Field Office requested that LANL management submit a plan by May 5, 2018, to develop a strategy that will accomplish integration of ongoing improvement initiatives to safely support required increases in pit production demands. The field office cites the need to integrate ongoing initiatives associated with safety basis unification, conduct of operations enhancements, nuclear criticality safety improvements, and transuranic waste system effectiveness with supporting infrastructure and safety management program efforts.

Transuranic Waste Facility: Last week, the NNSA Field Office conditionally approved with directed changes the ESS associated with the waste acceptance criteria issue (see 3/16/2018 report). The pertinent directed change requires the development of a Specific Administrative Control to protect the initial condition that runaway reactions or energetic events will not occur.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 20, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending April 20, 2018

Plutonium Facility–Safety Systems: On Tuesday, facility operations personnel entered the appropriate limiting condition for operation after a surveillance found the liquid level in an anion exchange column below the top of resin bed, which is an unsatisfactory condition. Program personnel promptly restored compliance with the addition of about a liter of weak nitric acid to the system. At the fact-finding, personnel were unable to determine an apparent cause for this changed condition. They reported that the last addition of solution occurred in January 2018 and recalled additions are typically made every three to four months; however, this information is not formally logged or trended. Management directed a confirmation of the valve alignment for the system. Notably, the NNSA Facility Representatives recently identified findings concerning system alignment checklists. In the case of the anion exchange system, a checklist exists for normal operations, but not for the inactive state that has existed for the past four years.

Plutonium Facility–Conduct of Operations: Last week, programmatic personnel opened a container from the early 1980's with database information indicating the presence of an unknown material based on the most recent measurement. They found an extra object in the container and requested a non-destructive assay that indicated the presence of plutonium. The workers confirmed that plutonium was not allowed in the glovebox and declared a potential process deviation. Fact-finding participants determined the need to use a glovebox with broader criticality safety limits for the handling of legacy items. The glovebox is posted out-of-service awaiting a recovery plan.

Transuranic Waste Facility (TWF): On Thursday, TWF personnel successfully received their sixth shipment, which consisted of eight waste containers. They executed the receipt using revision 10 of the procedure, which included changes to implement direction from the NNSA Field Office on the need for a new Specific Administrative Control to protect the initial condition that runaway reactions or energetic events will not occur (see 4/13/2018 report). The procedure implements this control with new steps requiring verification that the technical supervisor and waste facility management reviews are indicated as completed in the Waste Compliance and Tracking System. TWF personnel intend to seek approval to proceed with a 16 container receipt.

Waste Characterization Reduction and Repackaging Facility: Management decided not to pursue the planned campaign to clean residues out of unremediated nitrate salt parent drums given the limited time before the DOE Office of Environmental Management contract transition (see 3/16/2018 report). On Wednesday, workers began cleaning out the waste repackaging glovebox, removing campaign-specific equipment, and replacing glovebox filters to prepare the facility for dormancy. The parent drum campaign will be reprioritized as part of the legacy transuranic waste activities at Area G.

Emergency Management: On Monday, emergency response personnel responded to a bulging waste drum at the Sigma Facility. The drum primarily contained reactive metal powders, water, and machining oil; there was no radiological material. The response plan involved two robots, one of which used a new shearing tool to vent the drum at the bung. A smaller drum containing the same waste stream in Area L showed no visual evidence of bulging upon a follow-up visual examination.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 27, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 27, 2018

DNFSB Staff Activity: A.R. Powers supported the on-site office this week.

Federal Oversight: The NNSA Field Office Deputy Manager for Technical Operations recently reinforced expectations for field presence from his management and staff. The initiative is intended to drive participation in their enhanced oversight of conduct of operations in the Plutonium Facility, as well as increase overall operational awareness at the other nuclear facilities. Their goal for enhanced oversight is to execute each week: one proactive review by a subject matter expert, one review of a conduct of operations element by a Facility Representative, and one evaluation of the contractor's management observation program. They have begun tracking against these goals.

Plutonium Facility–Infrastructure: The engineering manager reported that current fiscal year efforts on the Project Execution Strategy are either on track or ahead of schedule (see 1/5/2018 report). A key deliverable for this fiscal year is the completion of seismic structural evaluations for four gloveboxes and development of an overall schedule for analysis of the remaining gloveboxes. Engineering personnel have completed three evaluations and are attempting to use a more efficient methodology for the fourth that will inform development of the overall schedule. This is important because currently more than 270 gloveboxes require seismic analysis.

Plutonium Facility–Conduct of Operations: On Wednesday, LANL management briefed the NNSA Field Office on the status of their conduct of operations improvement plan. They reported to be on schedule for most actions with several key training and mentoring initiatives coming due in the next few months. On Thursday, NNSA Field Office personnel met with LANL managers to discuss the results of their enhanced oversight effort for the month of April. On the positive side, they noted an excellent effort to collect worker identified issues as part of the pause of pit operations (see 3/30/2018 report). Among the weaknesses, they emphasized the need to strengthen processes and execution of the plan of the day to ensure work de-confliction and cognizance of operations. LANL managers noted that they have recently embarked on an effort to improve their scheduling and integration in an effort to increase productivity and this effort should have benefits for the plan of the day.

Waste Characterization Reduction and Repackaging Facility (WCRRF): WCRRF personnel completed the clean out and removal of programmatic equipment from the waste repackaging glovebox, shipped the resulting drums to Area G, and placed the facility into COLD STANDBY mode. Notably, WCRRF managers initiated a knowledge capture effort with key personnel ahead of the workforce dispersing as part of the pending transition to the new contractor for the EM Field Office. NNSA will retain ownership of WCRRF. They are currently working with LANL personnel to determine the future of the facility. While the facility has known deficiencies, it is the sole capability at LANL for repackaging transuranic waste with hazard category 2 amounts of nuclear materials.

Area G: N3B-Los Alamos, the new contractor for the EM Field Office, is poised to assume control of Area G operations on Monday.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 4, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending May 4, 2018

DNFSB Staff Activity: Members of the Board's staff held a telephone call with NNSA Field Office personnel to discuss leak path factor calculations for the Plutonium Facility.

Plutonium Facility–Infrastructure: Two weeks ago, Plutonium Facility personnel entered a limiting condition for operations due to inoperability of the new uninterruptable power supply (UPS). The UPS was placed into maintenance bypass to correct a deficiency identified during commissioning. Personnel were unable to restore operability. Further work on the system during the past two weeks has restored the UPS function, but the replacement parts used to repair the system are not fully qualified. Facility personnel are expecting to receive fully qualified replacement parts next week. During a post-job review for this activity, personnel identified a number of issues with the conduct of the job and proposed corrective actions to resolve them including component labeling, availability of appropriate tools and parts, lockout/tagout performance, and adequacy of work documents.

Weapons Engineering Tritium Facility (WETF): WETF personnel loaded tritium onto a hydride transport vessel for the first time in approximately a decade. The evolution proceeded smoothly. This process is essential to allow deinventory of significant quantities of legacy tritium that are no longer needed for programmatic purposes. Last month, WETF personnel removed the unused exhaust stack without incident (see 3/2/2018 weekly).

RANT Shipping Facility–Safety Basis: On Wednesday, LANL management transmitted a safety basis strategy document to the NNSA Field Office for review and approval. The RANT facility has been in cold standby since 2014 due to safety basis inadequacies and seismic vulnerabilities. The strategy proposes using the facility without a seismic retrofit and proposes a revision to the existing safety basis that reduces material-at-risk such that mitigated consequences are less than 5 rem to the public and 100 rem to the collocated worker. The strategy indicates the likely resulting material-at-risk limits will support shipping of about 95 % of the existing transuranic waste inventory. Notably, the strategy proposes deferring an upgrade to a safety basis complaint with DOE-STD-3009-2014 until next year, contrary to the path forward NNSA briefed to the Board on February 23, 2017. The strategy indicates safety basis submission in June 2018 with approval anticipated the following month in order to support restart of RANT in calendar year 2018.

Area G: On Monday, N3B-Los Alamos assumed control of Area G operations. They have established minimum staffing and established interim procedures largely adopted from previous versions. They plan to implement their own newly developed processes and procedures within 90 days. Operations this week focused on establishing communication systems and personnel relocations.

Transuranic Waste Facility (TWF): On Thursday, the NNSA Field Office released TWF from their startup plan allowing them to transition to normal operations and forgo the phase three demonstration of 16 waste containers based on multiple successes with eight containers. The approval emphasizes the need to practice prior to stacking operations. The practice is intended to address the constrained maneuvering environment for the existing forklift that NNSA observed during readiness.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 11, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 11, 2018

DNFSB Staff Activity: A.M. Hutain observed the emergency exercise discussed below.

Emergency Management: On Thursday, laboratory personnel conducted their annual full-scale exercise. This year's scenario involved a simulated helicopter crash into the Weapons Engineering Tritium Facility that resulted in a fire and three injured and tritium-contaminated patients. Participating response elements included the facility command, Security and Emergency Operations assets, Protective Force, Los Alamos County Fire and Police Departments, the Federal Aviation Administration, and the Los Alamos Medical Center. Exercise players provided self-critical feedback during the hot washes and noted several recurring issues including: incomplete notifications to the workforce; confusion between shelter-in-place and stay put protective actions; difficulties with radio and mobile phone connectivity; delays in medical response to patients; workforce personnel disobeying road blocks; and a lack of understanding on the hazards and detection methods for tritium by some response elements. Exercise controllers will conduct formal critiques and develop an after action report in the coming weeks. A team of NNSA personnel also provided oversight assistance to the field office.

Safety Basis: Last month, the DOE Office of Enterprise Assessments issued their report on the development and maintenance of safety bases at LANL. The report notes that LANL has increased its safety basis staffing and has adequate procedures, training and qualification, and unreviewed safety question processes. However, the report notes inadequate implementation of the quality assurance processes needed to improve the quality of safety basis submittals and the lack of associated assessments and metrics that could help drive improvements in this area. The report also notes persistent differences between LANL and NNSA Field Office personnel on the interpretation of safety basis requirements, despite recent initiatives to improve alignment.

Plutonium Facility–Infrastructure: On Tuesday, LANL management submitted to the NNSA Field Office for approval the safety design strategy for the fire alarm system replacement as part Phase 3 of the TA-55 Reinvestment Project. The project is being executed in accordance with DOE-STD-1189-2016.

On Wednesday, the NNSA Field Office unconditionally approved a safety basis addendum needed to install a modern chlorine gas delivery system in support of pyrochemical programmatic operations. The new system uses larger capacity source bottles and supports higher pressure gas delivery to an additional glovebox.

Plutonium Facility–Conduct of Operations: Last week, an observant worker noted a waste drum that did not have a label indicating it had gone through the in-service inspection required by the Technical Safety Requirements. An extent of condition on every waste drum in the facility discovered a handful of additional drums with errors in labeling or paperwork related to in-service inspections. All of the discrepancies have been addressed.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 18, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending May 18, 2018

Plutonium Facility–Safety Basis: On Wednesday, safety basis personnel entered their New Information (NI) process to examine questions raised last fall by the Board’s staff on the appropriateness of the respirable release fraction used in the accident analysis for seismic events (see 11/17/2017 report). The institutional NI procedure requires closure within 15 calendar days. DOE guidance for the contractor’s 10 CFR 830 obligation to declare a potential inadequacy of the safety analysis states “hours or days, but not weeks.”

Plutonium Facility–Infrastructure: Facility personnel repaired the uninterruptable power supply with qualified parts and exited the relevant limiting condition for operation (see 5/4/2018 report).

Plutonium Facility–Conduct of Operations: Last week, the Pit Technology division issued their report from their criticality safety days pause of operations in March (see 3/30/2018 report). The report noted excellent workforce engagement and lack of hesitance in raising issues and declaring process deviations. The report notes worker concerns including the need to: further simplify and strengthen the consistency of criticality safety postings across the facility; reduce administrative burdens to enable increased management floor presence; and address protracted temporary assignments for managers.

Plutonium Facility–Software Quality Assurance and Criticality Safety: On Monday, a management oversight team member identified that the total mass of nuclear material listed on the SLIP inventory posting for the glovebox was less than the actual amount in the glovebox. The work team declared a potential process deviation and responded appropriately. Criticality safety personnel determined the glovebox to be safe, as the actual material present was in compliance with the limits. Further investigation revealed that the inaccurate mass total had resulted from the presence in the location’s account of a negative plutonium value associated with a “non-physical parent lot,” which is a mathematical artifact used by the nuclear materials control and accountability system to account for measurement uncertainties. Fact-finding participants determined that the SLIP software did not properly account for this artifact and simply summed the values listed for the location resulting in a non-conservative and inaccurate total. Facility management has directed the use of more detailed inventory listings while corrective actions are pursued with the SLIP software.

Plutonium Facility–Conduct of Operations and Work Control: On Wednesday, a craft worker performing an exit survey discovered skin contamination on his hands. Follow-up surveys found contamination on the personal protective equipment of the other crew members. Radiological control personnel controlled the room, successfully doffed and decontaminated all impacted individuals, and performed follow-up surveys in the work area. The work crew had been installing clean piping underneath a glovebox. The most likely source of the contamination spread was from the breach of a contaminated system. The planned scope for the day did not include this higher hazard work to connect new piping to an existing vacuum system, similar to the significant contamination event this past fall (see 9/29/2017 report). Facility management paused all pipefitter work while corrective actions are executed.

Area G: Facility personnel performed a coached table-top emergency drill for training. The scenario was a lightning induced wildfire encroaching on the facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 25, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending May 25, 2018

DNFSB Staff Activity: J. Parham was on site to walk-down the electrical distribution systems at the Plutonium Facility, as well as supporting institutional electrical facilities.

Plutonium Facility–Conduct of Operations: Early last week, workers placed a container of plutonium salts in a glovebox where the criticality safety posting only allowed plutonium oxide or metal. While reviewing procedural changes last Thursday, the first line manager observed that the location did not permit the salts and initiated the potential process deviation process. At the fact-finding held last Friday, the workers involved in the event stated that they believed the salts were allowed because they were not explicitly forbidden by the posting. Notably, operations in this particular laboratory room have recently undergone two federal readiness assessments, as well as the criticality safety days pause (see 5/18/2018 report). Management revoked fissile material handler certification for this work crew and is currently conducting oral boards prior to their reauthorization for work. Management is also broadly assessing fissile material handler training based on apparent weaknesses exposed by this and other recent conduct of operations events. Management and nuclear criticality safety personnel learned that storage of salts was occurring in this glovebox, even though the operation includes a specialized storage box that has allowance for storing salts. As a result, they initiated an effort to map process flows across all glovebox locations that support the pit manufacturing flowsheet to ensure alignment between operations, criticality safety, and other safety programs.

In light of last week's contamination spread involving craft workers, the NNSA Field Office is encouraging the contractor to expand their conduct of operations improvement plan beyond programmatic workers.

Plutonium Facility–Safety Basis: On Thursday, the NNSA Field Office transmitted to LANL management their comments on the 2014 revision 2, 2016, and 2017 safety basis submittals. These comments support their overall effort to consolidate and modernize the safety basis. The associated project execution plan indicates a revised submittal by August 3, 2018.

Chemistry and Metallurgy Research Building: Facility personnel completed venting of the drum containing americium-241 from an offsite commercial vendor (see 2/16/2018 report).

Area G: Operations in Area G remain minimal following the recent contract transition (see 5/4/2018 report). Radio and cellphone communications have been established, as well as partial network access, though operations staff are largely reliant on paper-based procedures. Vegetation control to reduce wildfire risk has not been performed due to transition issues with the respiratory protection program. Routine surveillances in the area have noted increased vegetation growth.

Transuranic Waste Facility: Last week, the NNSA Field Office transmitted to LANL management their comments on a draft safety basis change necessary to upgrade the fire suppression system to safety significant. The final version addressing the changes is due June 8, 2018.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 1, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 1, 2018

Plutonium Facility–Safety Basis: LANL Safety Basis personnel completed the New Information (NI) process to evaluate the airborne release fraction (ARF) and respirable fraction (RF) for dispersible plutonium powders involved in seismic events (see 5/18/2018 report). They concluded that the ARF/RF values currently used in the Documented Safety Analysis (DSA) for the Plutonium Facility are sufficiently conservative, and that there is no Potential Inadequacy of the Safety Analysis. They based this conclusion on an evaluation of spill and impact ARF/RFs contained in *DOE-HDBK-3010-94*. The current DSA uses an ARF/RF from the handbook for free falling powders dropped from a 10 foot height which is bounding for a material enclosed in a glovebox that falls on its side. The NI evaluation further concludes that it is not credible to have objects fall on the spilled powder creating an additional airborne release as there are no postulated building or equipment collapses that could generate sufficient impact energy. The Board's staff plans to further evaluate this position as part of their ongoing review of the Plutonium Facility's Safety Basis.

Plutonium Facility–Fire Protection: During a routine surveillance, facility personnel discovered an acetylene bottle left in a room. The bottle was left in the location when the personnel using it exited because of a contamination spread (see 5/18/2018 report). In response, facility management has recognized that processes for evacuating rooms following radiological or other events should include a more formal process to determine if exiting workers left any conditions that need to be addressed as part of room recovery.

Weapons Engineering Tritium Facility: During morning rounds, a worker discovered that the safety-significant environmental chamber overtemperature protection system (ECOPS) had actuated and performed its safety function to cut power to one environmental chamber. There was no actual hazard since no tritium containment vessel was present in this chamber. The exact cause of the trip is not known, however there is no evidence of an actual temperature transient and this unit tripped again during investigation. All of the other units, some of which are currently protecting chambers with tritium present, appear functional and historically these systems have been highly reliable. However, the ECOPS units are old so facility management plans to begin the design process for a project to replace them with a newer system.

Confinement Vessel Disposition (CVD) Project: CVD personnel resumed vessel cleanout activities this week after halting due to performing non-destructive assays of daughter drums in an unauthorized location (see 4/13/2018 report). The team is now using a new location for non-destructive assay that is covered by a criticality safety evaluation document. They also have a new criticality safety evaluation that authorizes use of the location that had not been evaluated.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 8, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending June 8, 2018

Plutonium Facility–Conduct of Operations: On Wednesday, Plutonium Facility personnel held a post-job review after a plastic carboy of plutonium-238 aqueous processing waste solution experienced an unexpected level drop of about 5 of 6 liters. Programmatic operations personnel speculated that the solution evaporated through the threads of an intentionally loose cap after experiencing thermal heating from a proximately stored container of plutonium-238 fuel materials. They were unable to arrive at a more definitive explanation because at least two other solution spills recently occurred in this location and current practice does not involve the recording of precise carboy volumes. Post-job personnel discussed corrective actions to ensure greater balance between production and waste processing operations so as to minimize the backlog of waste solutions, as well as to evaluate processes for staging and spill response. Longer-term, the group is looking toward establishing engineered tanks in lieu of continued reliance on plastic carboys (see 3/16/2018 report).

Plutonium Facility–Radiological Control: On Tuesday, workers alarmed survey monitors when exiting a room where they were performing visual examination of items in preparation for bag-outs. Responding personnel discovered contamination on the personal protective equipment of two individuals and no skin contamination. Surveys of the work area found a contamination spread on areas of the room floor with evidence that a loose clamp on a bag-out port may have been the source of the contamination. The floor has been decontaminated and the room released back to operations. There have been several other discoveries of contamination on personal protective equipment during the past two weeks due to various reasons including breached glovebox gloves and work in elevated areas that are not routinely surveyed.

Area G: During a visual inspection on Thursday, workers noted two drums with evidence of possible degradation. They paused, reported their observations, and facility personnel entered the appropriate abnormal operating procedure to respond to drums with suspect integrity. Further investigation found the drums were intact. Facility management held a hotwash to evaluate emergency response performance. They concluded that the overall response went well and identified areas for improvement, notably in communications with resources located outside of Area G.

Radiological Laboratory Utility Office Building (RLUOB): On Monday, the NNSA Field Office approved the revised Safety Design Strategy for upgrading RLUOB to hazard category 3 (see 2/16/2018 report). The approval included two directed actions. First, the next revision of the strategy must include a technical justification for excluding the Central Utilities Building as part of the facility. The second was to address chemical mixtures in accordance with DOE-STD-3009-2014.

RANT Shipping Facility: Last Friday, the NNSA Field Office concurred with the contractor's Safety Basis Strategy for revising the RANT Documented Safety Analysis and Technical Safety Requirements (see 5/4/2018 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 15, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 15, 2018

DNFSB Staff Activity: On Monday, members of the Board's staff held a teleconference with site personnel to discuss the uninterruptable power supply for the Plutonium Facility and other topics related to electrical distribution systems (see 5/25/2018 report).

Plutonium Facility–Conduct of Operations: On Wednesday, two separate groups of programmatic personnel attempted to move materials through a glovebox trolley system. This trolley line has a discontinuity where material must be lowered into a dropbox and transferred to the other half of the trolley line. The work teams were not aware of each other's material moves, and one team discovered the other team's material when lowering a trolley bucket to complete their move. The groups appropriately paused and declared a potential process deviation. This configuration exceeded the mass limits for the drop box, but was within the credible upset condition analyzed in the criticality safety evaluation. The materials have been moved back to their original locations. Facility personnel are evaluating interim administrative measures to prevent recurrence of this type of event. There is a longer term design project to replace the glovebox trolley system and facility management requested that engineered controls to prevent this type of event be evaluated in the design process.

On Thursday, LANL management briefed the NNSA Field Office on the corrective actions associated with the recent unexpected level drop of plutonium-238 aqueous processing waste solution (see 6/8/2018 report). Based on further actions, they now believe it is more likely that the mechanism for the solution loss was a leak or spill instead of evaporation. Accordingly, they are taking a broad look at strengthening and unifying responses to spills across the plant. They also reported that they had secured resources to begin design development work next year on engineered metal tanks to minimize use of the plastic carboys. Additionally, they created a new operations team focused on processing these solutions in order to achieve a balance between production and waste processing.

Plutonium Facility–Training: Plutonium Facility management started training fissile material handlers to a new revision of the material handling and movement procedure. Key changes include a more explicit requirement that the person in charge of a move remain at the job site during the move and validate that the material inventory report is updated. In response to events during the past year, management has also reinvigorated programmatic training with several initiatives including: (1) hired experienced handlers to conduct training, (2) started a 'study hall' in the cold lab training facility where workers can bring questions to experienced personnel and practice activities using the high fidelity mockup equipment; and (3) launched a new training course to improve glovebox awareness for craft workers.

Area G: On Tuesday, N3B personnel conducted an operational drill involving response to a contaminated individual. Notably, the chief drill coordinator emphasized the need to eliminate the historical tolerance for simulation of response actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 22, 2018

MEMORANDUM FOR: S.A. Stokes, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 22, 2018

Weapons Engineering Tritium Facility: Last Thursday, the NNSA Field Office approved the third six-month extension of the Evaluation of the Safety of the Situation (ESS) associated with the Flanged Tritium Waste Containers (FTWC). LANL management previously recognized the potential that the FTWCs could be pressurized with an explosive mixture of hydrogen isotopes and oxygen (see 11/11/2016 report). WETF safety basis personnel are in the process of updating the ESS to consider this potential hazard for AL-M1 containers stored outside of FTWCs. They also continue to develop a safety basis addendum in support of future FTWC venting operations. The current schedule indicates performance of a contractor readiness assessment in mid-November 2018, pending submittal and NNSA Field Office approval of the addendum.

Confinement Vessel Disposition (CVD) Project: Last week, CVD personnel declared the seventh vessel completed.

Transuranic Waste Facility (TWF): On Wednesday, TWF management entered the New Information process after workers questioned whether waste drums received from the CVD project were covered by oxidizer testing documentation created for the Plutonium Facility. The nature of the vessel wastes are such that they are not expected to contain oxidizers; however, this may indicate a weaknesses in the implementation of the waste acceptance criteria. TWF currently holds about 150 waste containers.

Plutonium Facility–Planning: On Wednesday, LANL management conducted a workshop focused on identifying the impacts associated with establishing backshift operations at the Plutonium Facility. The discussions included mission drivers, lessons-learned from other sites, and supporting functions such as safety basis, occupational medicine, and radiological control.

Plutonium Facility–Conduct of Operations: Facility personnel held fact-finding meetings this week for two potential process deviations that occurred last week and both involved transuranic waste. In one event, workers paused after noting that a waste drum had not been fully characterized as waste and therefore questioned whether it complied with a criticality safety posting specifying “plutonium in waste.” Personnel are evaluating the clarity of this definition in the criticality safety program which does not appear to require material be fully characterized as waste per the procedural definition of “plutonium in waste.” In the second event, workers discovered bagged items were labeled incorrectly due to a communications breakdown.

Radioactive Liquid Waste Treatment Facility (RLWTF): The NNSA Field Office unconditionally approved a revised Hazard Analysis Report for the Low-Level Waste Subproject of the RLWTF Upgrade Project that supports categorization as a less than hazard category 3 nuclear facility. This Hazard Analysis Report revision updates the following: (1) expands the facility boundary to include chemical storage sheds; (2) updates process descriptions and inventories for radionuclides and chemicals; (3) confirms that an Emergency Planning Hazard Assessment is not required; and (4) adds detail to planned administrative controls.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 29, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 29, 2018

DNFSB Staff Activity: On Wednesday, a staff team discussed their observations from their review of the nuclear criticality safety program with NNSA Field Office personnel.

Weapons Engineering Tritium Facility (WETF): On Thursday, facility personnel commenced normal operations after successfully completing the activities defined in their startup plan from the 2015 federal readiness assessment.

Plutonium Facility–Conduct of Operations: As part of the corrective actions in the Conduct of Operations Sustainment/Improvement Plan, Plutonium Facility managers are receiving new training on expectations for management presence in the field as part of the Management Observation Verification (MOV) program. The training emphasized that engaged management presence in the field is a key means to drive improved behaviors, provided guidance on different types of MOV activities, explained how to do a high quality MOV, and introduced a MOV mentorship program where more senior managers will evaluate the MOV activities of lower tier managers.

Plutonium Facility–Infrastructure: The NNSA Field Office approved the Safety Design Strategy for the Fire Alarm System replacement project. The new fire alarm system will not have a credited safety function consistent with the existing system. The approval included direction for the LANL contractor to address comments from the Chief of Defense Nuclear Safety, notably that an evaluation of the interfaces between the new Fire Alarm System and the safety-significant Facility Control System to justify the assertion that there are no safety related risks associated with that interface.

Emergency Management: Last Thursday, Security and Emergency Operations issued their after-action report for this year's full-scale exercise at WETF (see 5/11/2018 report). The report notes findings associated with: (1) a service degradation in the mass notification system used to disseminate protective actions to the workforce and subsequent failure to manually notify the workforce via phone or radio following recognition of the service degradation; (2) an incorrect protective action issued by WETF management for a remain indoors versus shelter-in-place; (3) incomplete implementation of safety protocols concerning segregation of contamination zones at the Los Alamos Medical Center; and (4) failure to ensure a compensatory measure was performed for a previous finding. The report further identifies a further 6 deficiencies and 16 opportunities for improvement including: lack of basic controller/evaluator training for about 47 % of the applicable individuals, repeat concerns regarding reliability issues with cellular phone and radio connectivity at the emergency operations center and WETF area, and the need for WETF management to make timely and complete announcements to residents of the technical area. The report commends the performance of the WETF radiological technicians for briefing and controlling contaminated patients at the medical center.

This week, Security and Emergency Operations personnel conducted a new training course for all members of the Emergency Response Organization that are expected to fill Emergency Operations Center positions. The training provided an introduction to the major functions of the emergency management program and concluded with a tabletop drill.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 6, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 6, 2018

Management: On Tuesday, LANL management formally assigned the TA-55 Facility Operations Director (FOD) with control of the RANT Shipping Facility and the Waste Characterization, Reduction, and Repackaging Facility (WCRRF). This change is intended to better leverage the safety management programs in place at TA-55. As a result of this consolidation, the TA-55 FOD now covers all of the NNSA nuclear facilities with the exception of the Weapons Engineering Tritium Facility. The priority for RANT will be restarting operations this winter. WCRRF will remain in cold standby for the foreseeable future while NNSA continues to study the need for remediation of its existing waste inventory. In addition, LANL management is considering the potential for some out-year facility stabilization activities including the removal of the size reduction enclosure.

Transuranic Waste Facility (TWF): Last week, TWF safety basis exited the New Information process associated with questions regarding the implementation of a Specific Administrative Control (SAC) covering the waste acceptance criteria for waste containers received from the Confinement Vessel Disposition project (see 6/22/2018 report). They determined that the situation did not warrant a potential inadequacy of the safety basis, but required revision of the safety basis at the next annual update. Their justification includes, “The fact that the references are lacking does not necessarily mean the SAC has not been implemented or has been implemented incompletely; on the contrary, the information required to verify the SAC is effective does exist (and has existed for some time).” The New Information form then goes on to explain how each of the SAC performance criteria are met for the vessel disposition waste.

Nuclear Materials Management: Last month, LANL hosted a quarterly program review for the NNSA’s Material Recycle and Recovery and Storage programs. LANL personnel reported accomplishments including: transuranic waste shipping efforts to TWF, disposition of a 100 containers as part of the vault work-off effort; identification of process improvements on through-put for non-destructive assay; progress with the Chemistry and Metallurgy Research (CMR) facility de-inventory; efforts to identify a replacement for polyvinyl chloride bag-out bags; and progress on developing an in-glovebox certified container. They also highlighted impediments with CMR de-inventory associated with the disposition of various uranium-233 containing items.

Plutonium Facility–Waste Management: Plutonium-238 operations personnel are exploring methods to improve the efficiency of the waste management practices. In particular, bench-scale aqueous operations generate substantial quantities of glovebox gloves from frequent changes, as well as plastics from carboys used for staging solutions. Other challenging waste forms include hydroxide cakes and cheesecloth used for the decontamination of fuel clads. This waste generation creates challenges for housekeeping and compliance with transient combustible loading limits. Currently, all plutonium-238 waste is required to be dispositioned in pipe overpack containers, which have restrictive payload volumes. Notably, the use of the pipe overpacks even applies if the inner contents include other certified containers types (i.e. SAVY containers). Logistics personnel are examining the feasibility of relaxing this limitation and utilizing 55-gallon drums and standard waste boxes for certain materials in order to improve the throughput and minimize worker radiological exposure during waste management processes.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 13, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 13, 2018

Management: Transition activities for the laboratory management and operations contract commenced this week. Triad National Security, LLC will take over management of the laboratory from Los Alamos Nuclear Security, LLC after a transition period of not less than 120 days.

Plutonium Facility–Infrastructure: Facility personnel have started work to address the degraded glovebox spool piece in the aqueous chloride processing area (see 11/17/2017 report). A newly designed collapsible replacement piece will be installed. The design eliminates the need to move adjacent gloveboxes during the replacement. A similar degraded spool piece remains in the heat source plutonium area where interim confinement is still being provided by tape (see 10/3/2014 report). It is also scheduled to be replaced with a similar new spool piece.

Area G: At the completion of the eleventh week of operations under the new contract, Area G activities remain limited. Supporting programs and functions are also operating at a rudimentary level as N3B works to develop their own infrastructure. For example, personnel are using radios and mobile phones while new telecommunications circuits are established to replace removed land lines; however, signal coverage is incomplete and the lack of network circuits means that not all operations center staff can print documents. Training and qualification status is being tracked manually with uncertainty on the availability of courses as they come due. Respiratory protection is required for a variety of activities including some abnormal responses and routine operations such as vegetation and pest control; however, the required medical screening, training, and fit test programs are not yet established resulting in limited personnel that are certified to use a respirator. In the Resident Inspectors' opinion, this development of duplicate infrastructure stems from a relationship between LANS and N3B that is inconsistent with similar arrangements at other multi-contractor DOE sites where the management and operations contractor provide many of these services to other entities.

Confinement Vessel Disposition Project: Personnel moved the eighth confinement vessel from the Plutonium Facility yard to the Chemistry and Metallurgy Research Building for processing.

Weapons Engineering Tritium Facility: Facility personnel removed the Halon fire suppression system from the operations center (see 11/17/2017 report). The system had reached its end of life and replacement components were no longer available from the manufacturer. The system has not served a credited safety function since 2016 and will not be replaced. The safety-significant wet-pipe sprinkler system continues to provide credited fire protection for the facility.

RANT Shipping Facility: On Thursday, LANL management submitted an amended startup notification report to the NNSA Field Office that includes restart of the RANT Shipping Facility with a proposed NNSA readiness review. The projected startup date is mid-December 2018.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 20, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 20, 2018

DNFSB Staff Activity: On Wednesday, a staff team conducted a teleconference with LANL and NNSA Field Office personnel to discuss questions concerning the technical justification for using a dose conversion factor discussed below. This was a follow-up to questions originally submitted to the site in September 2017. B.K. Caleca observed a kick-off meeting for the column capital testing program that supports the ongoing seismic analysis of the Plutonium Facility.

Plutonium Facility–Safety Basis: Subsequent to discussion with the Board’s staff, LANL safety basis personnel entered their New Information process. The concern is a lack of technical justification for using dose conversion factors associated with Type-S biokinetic solubility for plutonium-238 oxides. Specifically, ICRP-71, which supports the ICRP-72 coefficients referenced in DOE-STD-3009-2014, details multiple human and canine studies that indicate the behavior of plutonium-238 oxide is more consistent with Type-M solubility. This matters because Type-M has a dose conversion factor about three times higher than Type-S. Additionally, LANL’s internal dosimetry team issued a report that examined how well various biokinetic solubility models fit bioassay data for a population of 160 Plutonium Facility workers that experienced plutonium-238 intakes between 1997 and 2017. The report indicates that approximately 50 percent of the intakes were best explained by biokinetic solubility models with dose conversion factors of Type-M or greater.

Plutonium Facility–Fire Protection: Last Friday, workers observed smoke in a glovebox containing a welding system within the Power Source Assembly Area, which is a building adjacent to the Plutonium Facility that handles encapsulated plutonium-238 heat sources. At the time, no radioactive or hazardous materials were in the glovebox, as they were conducting a test weld following adjustments to the fixture. The workers pressed the emergency stop button and one sought further guidance from the operations center. Operations center staff instructed them to pull a fire alarm and evacuate. Subsequent response actions revealed that paper media within three filters had burned. Fact-finding participants noted an overall good response and coordination with the fire department, but also identified some areas for improvement. The areas included inconsistencies in work control documents regarding the reliance on inert atmosphere within the welding box, the need to utilize infrared imagery earlier in the response, the need to replace the filters with non-combustible media, and the lack of drills within this facility.

Transuranic Waste Facility (TWF): On Wednesday, TWF personnel held a post-job review after a worker inadvertently actuated the seismic power cutoff system by placing a piece of a combo square tool on one of the sensor units. Post-job personnel noted excellent response and quicker recovery from the event than previous instances. Notably, the work was associated with the installation of covers over the sensor units to prevent inadvertent actuation from hailstones. TWF personnel plan to replace the units with redesigned components intended to correct this and other problems in September 2018.

Weapons Engineering Tritium Facility: On Wednesday, facility personnel successfully loaded a second hydride transport vessel (HTV). Once LANL is reinstated for use of the Bulk Tritium Shipping Package, use of HTVs will facilitate removal of bulk tritium gas from the facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 27, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 27, 2018

DNFSB Activity: Board Member Joyce Connery and staff member P.J. Migliorini were at the laboratory this week. They held discussions on progress toward standing-up operations at Area G under N3B, ongoing improvements to federal oversight at the NNSA Field Office, completed and planned improvements to the safety posture of the Plutonium Facility, and transition plans under Triad National Security, LLC. Their visit also included walk-downs of Area G, the TA-48 Radiochemistry Facility, the new Low-Level Waste radioactive liquid waste treatment facility and the Plutonium Facility. Ms. Connery also met with several local public interest groups.

Area G: N3B is currently using a List of Qualified Individuals, as they can no longer use the laboratory's electronic system for training and verification of worker qualification. During a management oversight verification of the list, a reviewer discovered that the list did not include all of the requirements that were in the qualification standard for waste operators. In response, N3B facility management paused all waste handling operations and started an extent of condition review. The immediate concern was to verify that the personnel required to comply with the minimum staffing in the Technical Safety Requirements had the proper training and qualifications. N3B facility management verified that they were compliant with the Technical Safety Requirements. The extent of condition review continues to evaluate other job responsibilities such as maintenance workers and radiological control technicians. Waste operations remain paused.

Plutonium Facility–Infrastructure: Facility personnel completed installation of a new glovebox spool piece in the aqueous chloride processing room (see 7/13/2018 report). They are currently monitoring the spool piece to ensure it is performing its intended confinement function. The work crew performed a post-job review to evaluate lessons learned and develop improvements to use for the next planned spool piece replacement.

Plutonium Facility–Conduct of Operations: On Wednesday, Plutonium Facility management issued their ConOps report for June 2018. The report includes discussion of two adverse events; the unexpected solution loss of plutonium-238 aqueous processing waste solution (see 6/8/2018 report) and the overmass in a dropbox associated with concurrent trolley operation (see 6/15/2018 report). The report also includes a discussion of noteworthy actions associated with operations staff self-reporting six potential process deviations that resulted in four categorized as non-infractions and the other two as severity index level 4 and 5. Additionally, the report includes a notable productivity improvement on the completion of a successful time-lapse video of casting operations, the first of a series to support knowledge transfer and training. The focus areas for management observations in July are reader-worker performance of Use Every Time programmatic operating procedures and conduct of operations for maintenance and construction activities.

Nuclear Criticality Safety: LANL management recently announced a new leader for the Nuclear Criticality Safety Division.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 3, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending August 3, 2018

Plutonium Facility–Emergency Management: Workers in the heat source plutonium wing opened a slip lid container holding process residues in a glovebox. They observed what appeared to be fine dust or smoke rising from the opened container. They closed it and pulled the fire alarm. The fire department responded and all facility personnel performed a controlled egress. The fire department responders performed thermal imaging and found no evidence of a fire. The facility has been restored to normal operations with the exception of this room pending further investigation.

Plutonium Facility–Seismic Safety: NNSA Field Office and LANL personnel briefed the NNSA Associate Administrator for Safety, Infrastructure, and Operations on seismic studies for PF-4 (see 7/7/2017 report). They provided their recommended approach and options for procurement of resources to perform nonlinear dynamic analysis. They also provided an update on the recently started column capital testing effort (see 7/20/2018 report).

Plutonium Facility–Infrastructure: A vacuum pump that supports solution transfers within PF-4 is undergoing repairs. One activity impacted by this loss of capability is an effort to replace valves on a series of tanks that are storing liquids destined for an upcoming limited scope cementation campaign (see 2/2/2018 report). The valve replacement activity is on hold awaiting the ability to transfer liquids between tanks using the vacuum pump.

Area G–Readiness: N3B personnel held their first Joint Evaluation Team meeting to determine what level of readiness review to use for resumption of Mobile Loading Unit operations to resume shipments of transuranic waste from Area G to the Waste Isolation Pilot Plant (WIPP). They concluded that a formal contractor or DOE readiness assessment was not required and a Management Self Assessment would be adequate. The basis for this decision was that the activity is an expansion of existing capability as the majority of the scope will be performed or directed by the WIPP Mobile Loading Team. Startup is expected prior to full development of N3B's new safety management programs so they will continue to use the existing programs adopted from the previous contractor. Last year, LANL started Mobile Loading Operations at TA-55, which included a safety basis addendum, with a federal readiness assessment (see 7/21/2017 report).

Area G–Safety Systems: A worker accidentally backed a small utility vehicle into one of the safety-class concrete vehicle barriers that reduce risk to waste stored in certain areas from vehicle impacts and pool fires. The worker immediately reported the incident and engineering personnel evaluated the integrity of the barrier through an in service inspection. There was no damage to the barrier.

Workers performing daily rounds discovered low pressure readings on the nitrogen supply for the fire suppression system in Building 412. Maintenance personnel found that valves on the nitrogen bottles were in the incorrect position. They corrected the position and are checking for possible system leaks. The Building 412 fire suppression system does not have a credited function in the safety basis and remains operable.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 10, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 10, 2018

Plutonium Facility–Emergency Management: On Monday and Wednesday, Plutonium Facility and emergency response personnel held hot-washes to review and learn from the response to last week’s potentially smoking container (see 8/3/2018 report). Key points that emerged from these discussions include: (1) the container involved originated in the late 2016 to mid-2017 timeframe and held waste debris from the plutonium-238 aqueous scrap recovery line, including a clump of degraded absorbent wipes; however, further information characterizing the contents is limited due to the lack of logs; (2) operations and waste management personnel assessed the container for disposal last Wednesday at which time they first observed the smoke/dust phenomenon, including at least one worker reporting the container to be warm to the touch; they informed line management on their observations, but not facility management or fire protection experts; (3) additional personnel observed the container on Thursday and conservatively concluded the phenomenon was smoke, at which time they contacted the operations center for guidance and were instructed to pull the fire alarm (similar to last month’s event, see 7/20/2018 report); and (4) the fire department’s current technology is insufficiently sensitive for heat-sensing applications inside gloveboxes; consequently, the determination that the situation was stable relied upon the observation that tape on the metal container had not degraded. The suspect container has been moved to an inert glovebox and management is developing corrective actions. The Resident Inspectors also note the many gloveboxes in the facility, including the one used to open the suspect container, await completion of fire hazard evaluations to determine the need for additional automatic or manual fire suppression capability (see 12/22/2017 report).

Plutonium Facility–Housekeeping: Plutonium Facility personnel recently completed an inventory. As part of the inventory, NNSA management requested extensive housekeeping activities that generated about 85 waste drums and about 24 other containers. This housekeeping activity improved the overall safety posture of the facility, particularly given that a large fraction of this waste represented unnecessary combustible materials that had been staged inside glovebox lines.

Plutonium Facility–Safety Basis: Laboratory personnel continue executing their New Information process on the question of plutonium-238 biokinetic solubility (see 7/20/2018 report).

Safety Systems: Last week, the NNSA Field Office issued their assessment report on diesel generator emergency and standby power systems at several of the nuclear facilities. They identified five findings, 13 observations, and one noteworthy practice. Findings of note include: (1) several work packages were considered complete despite incomplete performance of work steps and (2) in each case reviewed, diesel generator maintenance had not been identified, scheduled, and/or completed in accordance with NFPA 110 recommendations and LANL internal requirements. The field office requested issues management documentation within 15 days.

RANT Shipping Facility: Last Friday, the LANL contractor submitted the fourth quarter Startup Notification Report to the NNSA Field Office. The proposed restart date for the RANT Shipping Facility has been delayed from December 2018 to September 2019 (see 7/13/2018 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 17, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 17, 2018

DNFSB Staff Activity: On Tuesday, B.K. Caleca and M.T. Wright conducted a teleconference with NNSA Field Office and LANL contractor personnel to discuss actions taken to address the Board's letter dated May 12, 2016, related to the fire suppression system for the Plutonium Facility. On Wednesday, a Resident Inspector briefed the New Mexico State Legislature's Interim Committee on Radioactive and Hazardous Waste.

Plutonium Facility–Safety Basis: On Wednesday, Plutonium Facility management declared a potential inadequacy of the safety analysis related to the biokinetic solubility of plutonium-238 oxide (see 7/20/2018 report). In particular, safety basis analysts determined that all plutonium-238 powders that have not been calcined above 800 °C should use the dose conversion factor associated with Type M solubility. Operations personnel paused work and are implementing material-at-risk (MAR) restrictions. Facility management requested an extent of condition to examine the processing temperature history of plutonium-238 oxides received from offsite, as well as other materials that may be subject to this concern.

Last Friday, the LANL contractor submitted the safety basis annual update for 2018. This document represents their effort to modernize the hazards analysis and consolidate legacy safety basis documents (see 1/12/2018 report). The transmittal letter notes that upon approval and implementation, this new safety basis will close 13 different legacy documents. The NNSA Field Office is targeting approval this October. Facility management is developing an implementation schedule.

RANT Shipping Facility: Last Friday, the LANL contractor submitted a revised safety basis to the NNSA Field Office to support restart and address the Board's letter dated December 9, 2014.

Transuranic Waste Facility: Last week, workers inadvertently performed a MAR surveillance on the wrong building during a waste movement, which violated the technical safety requirements. They realized the error, performed the correct surveillance, and found that they did not exceed the MAR limits. Facility management has implemented a standing order requiring an additional check that the correct surveillance is being performed while they evaluate a long-term solution. Other recent developments include: (1) Facility personnel completed installation of a protective cover for the safety-class seismic power cutoff switch to prevent inadvertent actuation due to hail (see 7/20/2018 reports), (2) They also completed installation of a patch to replace the temporary repair to the insulation on the firewater tank (see 3/2/2018 report), and (3) On Tuesday, safety basis personnel submitted a revised safety basis to the NNSA Field Office that addresses upgrading the fire suppression system to safety-significant, modifies the control for chemical compatibility based on NNSA comments, and adds a new filter for pipe overpack container to address the results of recent fire testing.

Confinement Vessel Disposition Project: On Thursday, a worker inadvertently bumped the emergency stop button for the safety-significant ventilation system for the enclosure. The workers inside the enclosure started to exit and during their egress, two continuous air monitors alarmed. Facility personnel entered two limiting conditions for operations. There was no contamination spread during the egress, the ventilation has been restored, and a re-entry team returned the work area to a stable configuration before the end of the day. They plan to evaluate the stop button.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 24, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 24, 2018

Plutonium Facility–Infrastructure: On Saturday, a worker replacing degraded braided wire cable for a glovebox door counterbalance received a skin contamination due to a glovebox glove breach. The skin was not damaged and was successfully decontaminated. There is a substantial effort to replace these cables in plutonium-238 gloveboxes; one cable failed during use earlier this year. The sharps review process had not been used for this work package. During recent construction activities, workers received permission to cut a lock on a position controller for the Zone 1 ventilation system because the key could not be found. Following a cut, they accidentally dropped the bolt cutters, which impacted a glovebox window. The window cracked, but contamination surveys indicated it was not breached. Workers replaced the window later in the day.

Plutonium Facility–Conduct of Operations: In July, facility personnel removed two of the safety-significant fissionable material transport carts from service after the carts failed their in-service inspections. Last week, facility personnel observed that one of these carts was still in use and loaded with nuclear material. They removed the material and properly removed the cart from service. Previously, the cart had not been physically controlled and de-posted when it was originally taken out of service. Facility management is evaluating corrective actions.

Last Thursday, workers opened a legacy container in a glovebox where the criticality safety posting required a watertight container for the form and quantity of plutonium present. Once the outer container was opened, this requirement was no longer met. The work team initially opened the container in a hood then started a move to a glovebox due to surface contamination levels. On the path to this glovebox, they opened the container in a different glovebox to get a surveillance photograph. The team recognized the error and reported it after they completed the moves to the planned destination glovebox where the criticality safety posting would have allowed them to open the container.

Plutonium Facility–Operations: Plutonium-238 operations personnel continue to develop a work package to investigate the container that was observed to generate a smoke/dust phenomenon earlier this month (see 8/10/2018 report). This activity is important to validate the previously completed extent-of-condition review given it was guided by limited information on the container contents.

Weapons Engineering Tritium Facility–Safety Basis: Earlier this month, the LANL contractor submitted to the NNSA Field Office a safety basis strategy. The strategy notes the facility is currently operating with two documented safety analyses, three technical safety requirement documents, and an evaluation of the safety of the situation, with three of these documents of 2016 vintage. The strategy further notes that the 2017 safety basis annual update consolidated most of these documents, but has not been approved by the NNSA Field Office. As such, the LANL contractor proposed consolidating using the 2018 annual update with a scheduled delivery date of September 28, 2018.

Contract Transition: On Monday, LANS and Triad management held an all-hands meeting to update the workforce on the transition, including additional details on the planned organizational structure. The expected transition date remains November 1, 2018.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 31, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 31, 2018

DNFSB Staff Activity: M. McCoy, P.J. Migliorini, F. Sutherland, and M.T. Wright conducted a review of the proposed new safety basis for Area G and also walked down the facility.

Area G–Readiness: Subsequent to feedback from the DOE Headquarters subject matter expert on readiness, N3B managers convened their Joint Evaluation Team on Monday to reconsider the level of readiness required to restart Mobile Loading Unit operations (see 8/3/2018 report). In particular, the team further considered that mobile loading operations were last performed at Area G in 2013, thereby triggering the need for a federal readiness review. Given the low complexity of the activity, the team proposed conducting the review using a checklist approach.

Area G–Operations: On Monday, N3B personnel conducted a learning team to review the response that occurred last week after a worker observed potential concerns with the integrity of a waste container. Ultimately, N3B personnel determined that the container was not compromised; however, the learning team identified several weaknesses in the response. In particular, the response was delayed because the industrial hygiene technician did not have unexpired calibration check gas and had incomplete training and qualification elements related to both facility access and proficiency on the gas monitoring instrument. The learning team raised further questions associated with the appropriateness of the available instrumentation to detect all of the potential constituents of concern known to be present within the waste container population, the control of calibration gases, and the need to ensure a waste specialist is included as part of the response to the discovery of potentially compromised containers. More broadly, N3B managers questioned whether additional actions were needed to ensure the workforce was properly trained and equipped to support all elements of facility operations.

On Tuesday, the necessity of the above mentioned corrective actions was reinforced after an operator spotted a corroded drum that appeared to be leaking liquid. Monitoring indicated no radiological release; however, a review of the drum contents indicated the potential presence of a chemical that could not be detected with the available equipment. Consequently, facility management called in the LANL hazardous materials team, who overpacked the drum.

RANT Shipping Facility: On Tuesday, the NNSA Field Office responded to the latest proposed startup notification report (see 8/10/2018 report). The field office concurred with the need to perform a federal readiness review to restart RANT operations, but directed the LANL contractor to maintain the projected startup date as December 14, 2018, noting that the proposed date of September 1, 2019, was too distant.

Plutonium Facility–Infrastructure: Facility personnel recently restored the operability of one of the pumps serving the wet vacuum system that is used to transfer solutions in the facility. This action allowed programmatic operations personnel to move some aqueous waste solutions enabling the replacement of degraded valves that are needed to cement these solutions in the near future.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 7, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 7, 2018

DNFSB Staff Activity: On Thursday, a Resident Inspector observed the DOE hearing in Albuquerque to allow members of the public to comment on the proposed changes to 10 CFR 830, *Nuclear Safety Management*. No members of the public attended either of the two sessions.

Plutonium Facility–Accident Investigation: Last Thursday, LANL management received bioassay results that indicated the worker involved in the breached glove event during glovebox door cable replacements (see 8/24/2018 report) had received an uptake of plutonium-238. Subsequent wound monitoring indicated the presence of a contaminated puncture wound. The worker received treatment and is undergoing additional bioassay monitoring. Last Friday, the LANL Director chartered a team to investigate the abnormal event. The seven-person team commenced activities on Wednesday. Their scope involves work planning and control, conduct of the job, and the response up to the point of the wound monitoring. Given the uncertainty associated with the initial dose estimate relative to the DOE criterion for a federal investigation, NNSA has assigned two personnel to monitor the investigation.

Plutonium Facility– Emergency Management: On Saturday, the operations center received indications that a thermal fire detector activated in a plutonium-238 glovebox. Los Alamos Fire Department (LAFD) personnel responded and found no indications of fire. During release contamination surveys, radiological control technicians detected contamination on the skin of a firefighter's hand, as well as his turnout trousers. Subsequent decontamination efforts were successful. At the fact-finding held on Friday, personnel noted excellent communications between the operations center and LAFD. Facility personnel noted the need to strengthen training and revisit response protocols to reinforce expectations that LAFD avoid touching potentially contaminated surfaces. They also noted the continued need to explore alternative thermal sensing technology for gloveboxes (see 8/10/2018 report)—in this case the firefighter used his hand to confirm the lack of heat in the glovebox. LAFD personnel also noted that the state of housekeeping made it difficult to visually confirm the lack of fire in some of the gloveboxes.

Plutonium Facility–Operations: On Tuesday, Plutonium Facility management issued a standing order to implement operational restrictions associated with the recent Potential Inadequacy of the Safety Analysis related to plutonium-238 biokinetic solubility (see 8/17/2018 weekly). The operational restrictions include using a multiplier of 2.875 when determining the material-at-risk equivalent value for certain heat-source plutonium compounds that have not been calcined above 800 °C, limiting heat-source aqueous batch processing, and restricting material not related to aqueous processing in the heat-source room to a new lower limit.

Abnormal Events: Three other significant abnormal events recently occurred that all involve aspects of safety management programs that are essential to the safe operations of the defense nuclear facilities. The events include: (1) a less than adequate emergency response to smoking magnets at the LANSCE accelerator facility; (2) a partial reaction of an explosive detonator during handling at a high explosives facility; and (3) a near-miss during a lift when rigging equipment snapped and released a 47 foot long, 7000 pound column at the TA-3 electrical substation replacement project. LANL management is investigating the first two and the US Army Corps of Engineers is investigating the third.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 14, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 14, 2018

DNFSB Staff Activity: L. Schleicher was on site to observe paleoseismic trenching activities supporting the effort to update the seismic hazard analysis. B. Weathers was on site for resident inspector training for assignment at another DOE site.

Plutonium Facility–Accident Investigation: On Wednesday, programmatic management directed all operations personnel to conduct an extent of condition review for sharps/shards. The need for the review was based on preliminary information from the team investigation indicating that a sharps/shards review may not have been performed for all operations that include this potential hazard. As such, all glovebox and other operations associated with contaminated environments will not be conducted until a sharps/shards screening is conducted and appropriate controls identified. Management requested documentation of initial actions completed and subsequent plans by November 2, 2018. Similar actions were taken after previous puncture wound incidents (see 9/7/2007 and 12/5/2008 reports).

Plutonium Facility–Operations: This week, Plutonium Facility personnel stabilized accumulated plutonium-containing waste solutions through the aqueous nitrate cement fixation process. They conducted this process as a safe and stable operation under a senior supervisory watch since aqueous nitrate operations have not operated for about five years and have not completed formal readiness reviews. Of note, the revised procedure that governs the safe and stable exception to formal readiness reviews remains in approval.

Weapons Engineering Tritium Facility–Safety Basis: On Tuesday, the NNSA Field Office approved the updated Evaluation of the Safety of the Situation (ESS) for Flanged Tritium Waste Containers (FTWC) loaded with AL-M1 containers (see 6/22/2018 report). The revised ESS addresses ignition of potential flammable atmospheres in AL-M1 containers not stored in FTWCs and concludes that there are no credible internal or external ignition sources for the atmosphere within the AL-M1 and that pressure monitoring and venting activities can resume.

Last month, the LANL contractor submitted to the NNSA Field Office a safety basis addendum to support moving and venting the FTWCs. Once approved and implemented, the addendum will supersede the ESS discussed above. The addendum includes two new specific administrative controls related to lift height limitations and a lookout during lifting.

Transuranic Waste Facility–Safety Basis: The NNSA Field Office approved a safety basis addendum related to the safety-class seismic power cutoff switch. The addendum supports the redesign of this system which is currently unable to meet one of its original performance criteria.

Area G–Readiness: N3B personnel performed a management self-assessment to support restart of Mobile Loading Unit Operations (see 8/31/2018 report). The assessment included a drill on the response to high winds. Formal readiness reviews are planned for the end of the month.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 21, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 21, 2018

DNFSB Staff Activity: Y. Li observed paleoseismic trenching activities and the expert panel review supporting the effort to update the seismic hazard analysis. B. Weathers was on site for resident inspector training for assignment at another DOE site.

Seismic Hazards Analysis: The ongoing paleoseismic trenching activities are intended to use the geological record to provide refined inputs to update to the site-wide probabilistic seismic hazards analysis. This analysis is used to ensure acceptable seismic performance of systems, structures, and components in the nuclear facilities. Preliminary results from the trenching interpretations, pending results of laboratory age dating, suggest reduced uncertainty on the number of Holocene era events, which is a key parameter in defining the seismic hazard. LANL personnel are currently developing a plan to complete the necessary analyses and peer reviews to issue a new probabilistic seismic hazards analysis in the 2023 timeframe.

Plutonium Facility–Operations: On Wednesday, workers performing maintenance on electrolytic decontamination equipment inadvertently knocked a fitting loose. This resulted in a spill of several gallons of electrolyte solution into the glovebox. The spill exceeded the criticality safety posting limit for liquid in an unsafe geometry so the workers stopped and called a potential process deviation. As this process is undergoing restart, there was no fissile material in the glovebox, only depleted uranium.

Plutonium Facility–Work Planning: Programmatic operations personnel conducted multiple sharps identification walk-downs across the facility. Of note, some first line managers have highlighted the sharps hazards posed by the cutting of wire cables that are widely used as tamper indicating devices. Recognition of this hazard appears to be primarily communicated through mentoring.

Plutonium Facility–Nuclear Criticality Safety: On Tuesday, operations personnel declared a potential process deviation after a document review revealed that a criticality safety posting was inconsistent with the associated evaluations. Fact-finding personnel took an action to strengthen the processes for the implementation verification and annual operations reviews that failed to identify this issue since 2015.

Continuous Improvement: On Monday, the LANL Deputy Director issued a Healthy Culture Platform Charter. The intent of this document is to unify disparate efforts focused on impacting a healthy culture.

Contract Transition: On Monday, LANS and Triad management held another all-hands meeting to update the workforce on the transition. An important development this week is the transmission of job offers to the workforce. The current LANL Director also provided a brief presentation emphasizing recent adverse events (see 9/7/2018 report). He noted the importance of remaining focused and procedure compliant during the transition period. The expected transition date remains November 1, 2018.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 28, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 28, 2018

Area G–Readiness: This week, a four-person team conducted the contractor readiness assessment of mobile loading operations. The team reviewed documents, conducted interviews, and observed an operational demonstration and a drill. At their out-brief, the team concluded that all objectives were met without findings. The federal assessment is expected to conclude next week. N3B personnel hope to complete any necessary corrective actions and receive restart authorization in order to utilize the five shipments to the Waste Isolation Pilot Plant that are scheduled for N3B during the next two months.

Plutonium Facility–Conduct of Operations: On Tuesday, a worker conducting pre-requisite checks of a glovebox discovered that the inventory of nuclear material exceeded the posted criticality safety limit. The worker responded appropriately and made the required notifications. Management and criticality safety personnel then agreed to move an item to a different glovebox thereby restoring compliance with the limits. At the fact-finding, a different worker explained that he had moved material into the glovebox on Monday afternoon as part of a housekeeping activity. This activity was not discussed at the pre-job briefing and the worker did not utilize the material movement procedure, which required a use-every-time checklist and peer check for the amount of material that was moved. The division leader announced several corrective actions including a work pause for next Monday to emphasize elements of conduct of operations, as well as temporarily mandating use of the material movement checklist with a supervisor-level approval for all material moves—the procedure currently only requires this level of rigor for moves that exceed 3 kg.

Plutonium Facility–Glovebox Safety: Last Friday, while executing a maintenance procedure on the newest direct-metal oxidation furnace, a worker snagged and breached a glovebox glove on a handle while reaching with a wrench to remove a stuck bolt. The response to the breach was consistent with procedure and there were no indications of an airborne release of radioactive material. Fact-finding personnel noted that the handle did not present an obvious sharp hazards and discussed that the worker was not wearing protective over-gloves because of the dexterity required for the job. Glovebox safety experts suggested trying a newer type of over-gloves that offer improved dexterity. Some of the discussion also indicated opportunities to strengthen the design process used for new equipment. For example, the worker was removing bolts on a flange that requires periodic removal for maintenance. However, no special tooling had been provided to access bolts that have limited clearance from a nearby cooling water conduit and no torque specifications were provided in the maintenance procedure. The work team identified these as areas for further consideration.

Plutonium Facility–Safety Basis: On Wednesday, facility management declared a technical safety requirement violation after an operator determined that a surveillance on an accelerometer had exceeded its required periodicity. Facility personnel successfully executed the surveillance later that afternoon. Fact-finding personnel noted that surveillances are currently tracked in an electronic database, but that dates are manually entered for the roughly 2700 surveillances performed annually. Facility personnel completed an extent-of condition review and found no further errors. As an interim corrective measure, they plan to introduce independent verification of the dates in the database while they work to utilize improved software functionality.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 5, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 5, 2018

Area G–Readiness: On Thursday, N3B personnel successfully restarted mobile loading operations with a shipment of 21 transuranic waste containers to the Waste Isolation Pilot Plant (WIPP). They received EM Field Office approval for restart on Tuesday after completing a federal readiness review and addressing the findings. The federal review team identified a pre-start finding regarding the use of hands and feet to guide suspended loads. The team also identified post-start findings associated with the need to conduct drills for the full range of potential abnormal scenarios and the need to develop a qualified program to perform inspections of forklift attachments. Of note, N3B had planned on a larger shipment, but one of the shipping containers they received from WIPP had an expired certification.

Emergency Management: Last Thursday, federal and contractor personnel convened an emergency communications working group to characterize and address challenges with cell phone and radio coverage identified during exercises. In particular, during this year's full-scale exercise emergency management personnel noted spotty to non-existent coverage at the Weapons Engineering Tritium Facility, as well as a nearby fire station and the emergency operations center (see 6/29/2018 report). They previously noted similar issues going back to at least 2011. The group agreed to conduct a communications assessment on a prioritized listing of defense nuclear facilities and other key facilities. Of note, the group includes EM Field Office and N3B personnel. This is particularly relevant since communications at Area G are currently heavily dependent on cell phone and radios.

Plutonium Facility–Conduct of Operations: On Monday, one of the programmatic divisions paused work in order to review conduct of operations fundamentals with the workforce as a corrective action from the recent overmass (see 9/28/2018 report). The presentations emphasized technical expertise, questioning attitude, precise communications, and the need to stop and brief when changes occur to planned work.

Plutonium Facility–Safety Basis: Safety Basis personnel entered the New Information process to evaluate whether a discrepant as found condition constitutes a Potential Inadequacy of the Safety Analysis. The concern is two argon drying furnaces in the facility's basement that are not described in the Documented Safety Analysis.

Operations Assessment: On Monday, LANL management chartered an assessment team to examine the circumstances surrounding a violent reaction that destroyed a beaker and injured a worker with lacerations to the neck and hands. The reaction occurred during a synthetic chemistry activity at TA-35 on September 14, 2018. Of note for the defense nuclear facilities, the scope of the assessment is to include operational discipline, work authorization and control, and emergency management. They expect to complete their report by October 23, 2018.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 12, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 12, 2018

Safety Basis: Once removed from an engineered structure, transuranic waste containers (drums and standard waste boxes) provide the only means to reliably confine radioactive materials. Containers can be handled outdoors at the Plutonium Facility, Chemistry and Metallurgical Research (CMR) building, Transuranic Waste Facility (TWF), Radioactive Liquid Waste Treatment Facility (RLWTF), RANT Shipping Facility, Waste Characterization Reduction and Repackaging Facility (WCRRF), and Area G. The resident inspectors compared the treatment of transuranic waste containers in the technical safety requirements (TSR) across these facilities knowing that waste containers routinely move between these facilities and are subject to a number of potential degradation mechanisms. The TSR provides the specific parameters and requisite actions for the safe operation of a nuclear facility.

The comparison revealed differences in the actions required by facility management upon discovery of a degraded container. For example, the TSR for TWF contains limiting conditions for operation (LCO) that require operators to overpack a degraded container into a compliant container or remove it from the facility within 7 calendar days. At the Plutonium Facility, waste containers are considered design features and failure of an in-service inspection of a container triggers consideration as a potential inadequacy of the safety analysis—a process that under current local procedures may take up to 15 calendar days. At Area G, the TSR also considers waste containers as design features, but dictates the need to overpack a degraded container into a metal container without a time requirement as part of the Hazardous Material and Waste Management Program. The TSRs for CMR and RLWTF do not address waste containers. RANT and WCRRF are currently not operating. In practice, facility management typically addresses degraded containers in a prompt manner; however, LANL management had identified the need to strengthen consistency across the TSRs and create LCO-like actions statements for design features as part of an earlier Safety Basis Improvement Plan (see 6/5/2015 report).

Area G—Safety Basis: On Tuesday, N3B personnel conducted a fact-finding to re-evaluate an incident that occurred in July where a worker brought a vehicle into a Combustible Restrictive Area without first notifying the Operations Center contrary to a procedure. In July, N3B management concluded that this incident represented a procedural violation; however, subsequent review by N3B safety basis and engineering personnel questioned whether this actually represented a TSR violation because the necessary surveillance to ensure compliance with combustible liquid limits was not performed at the proper time (i.e., before the vehicle entered the area). After a healthy discussion on the challenges interpreting the existing safety basis, N3B management concluded that the event constituted a TSR violation. The long-term solution to this type of confusion will be implementation of the new documented safety analysis (see 2/23/2018 report); however, the EM Field Office approval date has been delayed from previous schedules and N3B's overall implementation strategy remains in development.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 19, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 19, 2018

DNFSB Staff Activity: On Monday, the Board's staff held a teleconference with EM Field Office and N3B personnel to discuss the control strategy for postulated fuel fires and vehicle crash incidents associated with transuranic waste mobile loading operations at Area G.

Contract Transition: On Wednesday, management from Triad, LANS, NNSA Headquarters, and the NNSA Field Office conducted a transition readiness review. Triad managers provided NNSA leadership with their justification for readiness to assume responsibility for management and operations of the laboratory. Triad personnel also presented what they believe are the top risks to successful operations: conduct of operations, the waste cycle, project execution, and human capital. They also presented risks specific to nuclear facility operations that included the need to improve planning, operational discipline, criticality safety performance, and organizational learning

Area G–Safety Management Programs: At the end of September, N3B personnel provided the EM Field Office with the majority of their proposed safety management program documents. The field office has so far approved the Nuclear Criticality Safety Program. N3B has not yet submitted their Radiation Protection Program as they work to either obtain their own accreditation or acquire services from a DOE Laboratory Accreditation Program (DOELAP) accredited entity. The current service agreement with LANS that provides limited Radiation Protection Services expires on January 30, 2019, and N3B does not expect DOELAP accreditation in place by that time. N3B is tracking this as a high operational risk as dosimetry is required for entry into mission critical parts of Area G.

RANT Shipping Facility: On Wednesday, the NNSA Field Office requested that LANS provide by next Friday a schedule to ensure the safe restart of the facility with a goal of January 2019. The strategy and schedule for restarting RANT—a capability that is essential to risk reduction across the laboratory—has been the subject of multiple perturbations since going into cold standby in 2014. For example, NNSA initially desired to restart using a modern safety basis developed in accordance with DOE-STD-3009-2014 (see 10/8/2017 report). LANS also spent years conducting geotechnical investigations and designing a seismic retrofit (see 12/2/2016 report) only to recommend not pursuing upgrades. The current strategy relies on a DOE-STD-3009-1994 derived safety basis that limits material-at-risk such that the unmitigated accident consequences are below thresholds requiring safety controls (see 5/4/2018 report). NNSA expects to approve this safety basis in the coming weeks, leaving implementation and readiness to pace restart; however, NNSA and LANS continue to align schedule expectations (8/31/2018 report).

Coincidentally, the need for a viable indoor transuranic waste shipping capability was underscored after Plutonium Facility personnel spent the week attempting a mobile loading shipment, but were unable to proceed due to inclement weather. They will try again next week, though this delay will likely curtail N3B's planned shipment from Area G, impacting overall risk reduction at the laboratory. The NNSA Field Office specifically emphasized the need for timely RANT restart in order to capitalize on shipping opportunities that arise in the winter. Previous LANS studies indicate that less than half the days per year have wind and temperature conditions that support outdoor mobile loading.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 26, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 26, 2018

DNFSB Staff Activity: Staff members P. Migliorini, A. Powers, R. Tontodonato, and M. Wright were on site to review the safety basis of the Plutonium Facility. They also walked-down the mobile loading pad at Area G, as part of an ongoing review of the adequacy of the control set for that activity.

Transuranic Waste Facility: On Wednesday, the NNSA Field Office issued a Safety Evaluation Report approving the contractor's safety basis revision to address upgrading the fire suppression system to safety-significant, chemical compatibility controls, and new filters for pipe overpack containers (see 8/17/2018 report). The Safety Evaluation Report includes one condition of approval that directs the contractor to revise certain hazard analysis events to specifically credit the fire suppression system for risk reduction.

Emergency Management: On Wednesday, Emergency Operations Center personnel conducted their quarterly drill with simulated field play. The scenario involved a vehicle accident in the Transuranic Waste Facility resulting in a pool fire potentially impacting the sixteen waste drums on the vehicle. The scenario used actual meteorological conditions, which created the challenge of measuring alpha contamination in the rain. Many members of the incoming Triad management team observed the drill.

Transuranic Waste Management: On Monday, Plutonium Facility personnel were able to mobile load 16 containers of sealed sources into two shipping containers for disposal at the Waste Isolation Pilot Plant, completing the attempt that started last week. They had hoped to load a third shipping container, but were prevented by poor weather conditions on Tuesday and Wednesday.

Confinement Vessel Disposition Project: Last Thursday, the safety-significant ventilation system for the enclosure unexpectedly shut down near the end of a job. There were no continuous air monitor alarms. Engineering personnel responded and were unable to determine the cause of the ventilation failure. They were able to restart one fan through a system modification; however, the work was not performed as part of an approved work package. They continued troubleshooting this week, but have not restored the system operability. As such, the facility remains in the limiting condition for operations with the material-at-risk in the enclosure in a stable configuration.

Nuclear Criticality Safety: Last week, the division leader issued their performance metrics summary for fiscal year 2018. Overall, the metrics indicate a rating of needs improvement; however, the report indicates a number of encouraging developments. The group exceeded their field time targets in each of the quarters and completed annual fissionable material operations reviews coming due each month at a rate of 97 % or better. During the year, the group also reduced the number of infractions open longer than 12 months from 9 to 1 and removed 36 operations from the compliance backlog. Staffing continues to improve with an increase during the year of 2 each for in-training and qualified analysts for a total of 25 direct employees supported by an additional 8 sub-contractors. The metrics indicate that the primary areas for improvement are program implementation and process deviations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 2, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 2, 2018

Management: On Thursday, Triad National Security LLC assumed responsibility for the management and operations of the NNSA scope at LANL.

Area G–Safety Systems: On Tuesday, N3B engineering personnel performing a walk-down discovered a discrepancy between the drawings and field configuration for safety class vehicle barriers protecting high risk areas. An immediate operability evaluation determined that all of these vehicle barriers are configured improperly and are inoperable. Facility operations personnel subsequently implemented compensatory measures consistent with the technical safety requirements (TSR) actions associated with repair, relocation, or maintenance of the vehicles barriers by restricting vehicle access. N3B personnel are developing a design and a work package to restore the barriers to the required configuration.

Plutonium Facility–Radiological Safety: Last Friday, a worker received a puncture wound while performing electrical installation work for a new glovebox. Facility personnel followed the radiation protection standing order implemented following the discovery of a puncture related uptake (see 9/7/2018 report) and ensured the worker received a wound count. There was no evidence of an uptake. The work package for this task required puncture resistant gloves for tasks with potential sharps hazards; however, the worker was not wearing the required gloves because the puncture occurred during a wire brushing activity that was not recognized as having potential sharps. The investigation report from the earlier puncture is with DOE Headquarters for review.

RANT Shipping Facility: On Thursday, the NNSA Field Office conditionally approved the revised safety basis. The conditions of approval require Triad to: (1) elevate controls on acetylene and electric forklifts to Specific Administrative Controls in the next TSR revision and (2) revise the safety basis within 30 days to ensure adequate criteria to verify containers meet Waste Isolation Pilot Plant certification. Last Friday, the NNSA Field Office received a schedule to support facility restart (see 10/19/2018 report). The schedule anticipates achieving startup authorization on January 30, 2019, assuming a number of factors including success-based reviews and parallel contractor and federal performance demonstrations.

Safety Basis: Protecting the limit of radioactive material inventory assumed in the safety analysis is an important function of a TSR. The resident inspectors found that this function is inconsistently specified in the TSRs at LANL. For example, operators must execute a surveillance to ensure compliance with the limit *prior to* any receipt of inventory at the Confinement Vessel Disposition project, Transuranic Waste Facility, the Waste Characterization, Reduction, and Repackaging Facility, and certain locations at Area G. Surveillances are required on a monthly or greater periodicity at the Weapons Engineering Tritium Facility, the Plutonium Facility, and the Chemistry and Metallurgy Research building. The recently approved TSR for the RANT Shipping Facility requires the inventory surveillance, which is the primary TSR control, within 8 hours of receipt. The TSRs are also inconsistent with the required completion times to restore inventory. For example, the Plutonium Facility is immediate, while RANT allows up to 7 days.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 9, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 9, 2018

DNFSB Staff Activity: On Friday, P. J. Migliorini conducted a teleconference with N3B and EM Field Office personnel to discuss the results of the staff's review of the safety control strategy for mobile loading operations at Area G. K. L. Sullivan was at the laboratory providing resident inspector support with emphases on observing conduct at facility operations centers and work release practices.

Management: On Wednesday, the new LANL Director conducted an all-hands briefing. Of note, he discussed four specific actions that Triad had committed to NNSA: (1) delivering an integrated plan for mission activities at the Plutonium Facility within 6 months; (2) assessing outstanding criticality safety evaluations within 6 months; (3) revalidating capital project baselines within 6 months; and (4) training first line managers of hazardous operations areas within a year. He also announced immediate focus on improving operational practices, the waste cycle, human capital, and project execution. Triad is also developing a common lab agenda that focuses on simultaneous excellence between operations and mission execution, while enhancing confidence from the community.

Plutonium Facility–Readiness: On Monday, a 13-person contractor readiness assessment team commenced their review of Uranium Electrolytic Decontamination (UED) operations. The operation is primarily conducted in two gloveboxes and uses an electrolytic process to remove plutonium surface contamination from uranium parts. The operation also includes a solution processing step where actinides are precipitated from the electrolyte, filtered, and dried prior to disposal. Overall, UED provides clean uranium parts that can then be converted to oxide for eventual transfer to facilities in Tennessee. This week, the team conducted interviews and observed operational demonstrations including a drill. They plan to complete their assessment next week.

Plutonium Facility–Operations: This week, Plutonium Facility personnel completed the limited aqueous nitrate cement fixation campaign (see 9/14/2018 report). The third and final drum containing cemented legacy radioactive waste solution is curing over the weekend.

Plutonium Facility–Glovebox Safety: On Thursday, Plutonium Facility personnel held a post-job review after a glovebox glove apparently breached during a maintenance activity. Post-job personnel noted that the worker appropriately detected the contamination on his inner glove during self-monitoring at the glovebox and that response by radiological control technicians was excellent. There were no other indications of contamination. Notably, glovebox safety personnel had recently conducted a sharps review for this maintenance activity. Next week, they plan to examine the glove and reassess the activity for sharps hazards.

Transuranic Waste Management: The Waste Isolation Pilot Plant resumed receiving shipments this week allowing departure of the trailer that Plutonium Facility personnel had previously mobile loaded with 21 transuranic waste containers (see 10/19/2018 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 16, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 16, 2018

DNFSB Staff Activity: D. J. Cleaves was at the laboratory this week to gain familiarization of the pit manufacturing flowsheet and evaluate lessons learned for execution at the Savannah River Site.

Plutonium Facility–Readiness: On Wednesday, the contractor readiness assessment (CRA) team out-briefed their findings for their review of Uranium Electrolytic Decontamination operations. The CRA team noted one pre-start finding, two post-start findings, three recommendations that did not rise to the level of a finding, three deficiencies that were outside the CRA scope, and four noteworthy practices. The pre-start finding was that the worker hazard assessment and abatement required by 10 CFR 851, *Worker Safety and Health Program*, was less than adequate. One post-start finding was the lack of objective evidence that glovebox components were evaluated per NFPA 70, *National Electrical Code* to address the hydrogen gas created by the process. The other pre-start was that LANL personnel had not fully satisfied the requirements of their internal readiness preparation processes. They expect to issue their final report early next month. Of note, the CRA team applauded the operational excellence displayed by the work crew. NNSA anticipates conducting their readiness review in January 2019.

Plutonium Facility–Work Control: On Tuesday, Triad management issued a standing order to implement a Weapons Integrated Production Schedule. The order realigns area controllers' functions and management reporting, as well as adjusts several aspects of the work scheduling and release process with the intent of maximizing the effectiveness of the plan-of-the-day.

Plutonium Facility–Glovebox Safety: On Wednesday, glovebox safety personnel walked down the location of last week's glovebox glove breach. They identified a burr on a reach tool that plausibly contributed to the breach.

Area G–Safety Systems: On Tuesday, N3B management began issuing a daily shift order implementing a temporary modification that permits limited vehicle traffic into Area G while the safety class vehicle barriers are inoperable (see 11/2/2018 report). The shift order designates a required vehicle route that avoids high-risk locations containing transuranic waste by transiting across a low-level waste burial pit. Vehicle access remains restricted outside of the specified route. N3B completed the design to return the vehicle barriers to service and is developing a work package, including worker training for vital safety systems, to implement the design.

This vehicle allowance was intended to facilitate mobile loading operations to execute a planned shipment of transuranic waste from Area G to the Waste Isolation Pilot Plant (WIPP). However, mobile loading did not take place this week due to cold temperatures. N3B will attempt to mobile load another shipment after the Thanksgiving holiday.

RANT Shipping Facility: On Wednesday, Triad management provided the NNSA Field Office with an update to the previous schedule for restart of the RANT Shipping Facility (see 11/2/2018 report). The new schedule shows contractor and federal readiness reviews in February 2019 with start-up authorization anticipated by the end of that month. Operation of RANT is essential to reliably make use of shipping opportunities to WIPP thereby reducing risk across the laboratory.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 23, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 23, 2018

DNFSB Staff Activity: A resident inspector observed briefings to the New Mexico State Legislature's Interim Committee on Radioactive and Hazardous Materials. The briefings included the New Mexico Environment Department's update on the Waste Isolation Pilot Plant and the new LANL Director's overview of the Triad transition.

Plutonium Facility–Criticality Safety: Last Thursday, Plutonium Facility personnel discovered an unexpected condition with a plutonium and uranium item taken from the vault for surveillance. The item had oxidized significantly and was arranged in a configuration with a sample staged inside of it similar to a previous instance (see 3/9/2018 report). Neither condition was compliant with the criticality safety posting for the glovebox where the item was introduced and unpackaged. Fact-finding participants noted that the work team responded appropriately and called in a potential process deviation when they discovered the oxide. Upon review, criticality safety personnel determined the situation was safe and stable. A similar item with unknown deterioration will be taken from the vault in the near future to undergo the same surveillance. Facility personnel plan to pre-stage a response team to address any potential deviations with this item.

During an annual fissionable material operational review conducted last Friday, a reviewer discovered an error in the criticality safety evaluation for a safe adjacent to a floor storage location. Specifically, the general location description in the evaluation for the safe did not acknowledge the presence of the adjacent floor storage location. Criticality safety personnel subsequently determined that interaction was not a controlled parameter in the evaluation and plan to address the error in the description.

Confinement Vessel Disposition Project: Project personnel recently completed debris removal from vessel 8. Earlier this month, engineering personnel completed a prompt operability determination that concluded that the safety-significant Enclosure Ventilation System is operable but in a degraded condition as only one of two trains is functional (see 10/26/2018 report). This configuration meets all safety basis requirements. Facility personnel plan on restoring the second train to service to improve safety of the operation. Project personnel expect to begin cleanout of vessel 9 early next calendar year.

Weapons Engineering Tritium Facility–Safety Basis: NNSA Field Office personnel are completing their review of a safety basis addendum intended to facilitate venting of the three Flanged Tritium Waste Containers (FTWC) with the potential for explosive headspaces mixtures of oxygen and hydrogen isotopes (see 9/14/2018 report). In parallel, NNSA and EM Field Office personnel and their contractors continue to evaluate options for the four FTWCs with similar concerns currently located at Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 30, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 30, 2018

Area G: On Monday, N3B personnel discovered that personnel maintaining the minimum staffing requirements per the Technical Safety Requirements had expired for a required qualification on lockout/tagout training. Facility management promptly placed all designated areas into warm standby and obtained the required training for personnel. They later declared a violation of the Technical Safety Requirements and completed an extent-of-condition review. The list of qualified individuals was incorrectly tracking this requirement based on information provided by LANS that subsequently changed following transition. N3B continues to explore acquiring a comprehensive learning management system as there have been other instances of issues associated with the list of qualified individuals.

Once the appropriate personnel were verified to be appropriately qualified, N3B completed a mobile loading shipment that included eight drums of cemented waste and five drums from the offsite source recovery program. Vehicles involved in the shipment used the designated vehicle route as the safety class vehicle barriers remain inoperable (see 11/16/2018 report).

Plutonium Facility–Nuclear Criticality Safety: On Monday evening a faucet malfunctioned in the same restroom as the water overflow event from this past March (see 3/16/2018 report). Similar to the first event, the water flowed from the mezzanine to the first floor and then further on to the basement. The water flow resulted in some ponding, in part due to the fact that a sump pump was de-energized because of concurrent breaker maintenance. Given the recurrence of this event, Triad management plans to conduct a fact-finding next week to better understand the extent of this condition and its implications for assumptions in nuclear criticality safety evaluations.

Emergency Management: On Tuesday, the NNSA Field Office, after consultation with NNSA Headquarters, concurred with a proposal from the previous laboratory contractor to use the Computer Assisted Protective Action Recommendation System (CAPARS). This software will be used for improved analysis in support of Emergency Planning Hazard Assessments (EPHA). CAPARS uses a three-dimensional Lagrangian model that includes site specific terrain and weather data that is expected to improve accuracy compared to the existing analysis software packages that use a simple Gaussian model. LANL is the first site in the DOE complex to use CAPARS for emergency planning. Triad intends to complete updating all of the EPHAs using CAPARS by the end of fiscal year 2020.

Weapons Engineering Tritium Facility–Safety Basis: On Wednesday, the NNSA Field Office unconditionally approved the safety basis addendum to vent the Flanged Tritium Waste Containers (see 11/23/18 report).

Fire Protection: On Thursday, the NNSA Field Office approved the 2018 Baseline Needs Assessment. In their approval, NNSA noted that increasing minimum staffing at the fire department and replacing two fire stations are key issues to be addressed through negotiations between NNSA and the Los Alamos County Fire Department.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 7, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending December 7, 2018

DNFSB Staff Activity: The Resident Inspectors were in Washington, D.C. to brief the Board and attend meetings. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 14, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending December 14, 2018

DNFSB Staff Activity: Staff members J. Anderson, Z. Beauvais, C. Berg, M. McCoy, and P. Migliorini were at the laboratory to review weapons response basis information in support of safe operations at the Pantex Plant.

Area G: N3B personnel completed a mobile loading shipment of one HALFPACT and two TRUPACT-II containers to the Waste Isolation Pilot Plant (WIPP). The shipment contained cemented waste overpacked in standard waste boxes. Prior to the shipment, Central Characterization Project personnel noted a discrepancy in the databases at WIPP and LANL between the coding of inner drums compared to their overpacks. All drums in this week's shipment were re-verified to meet requirements. Vehicle operations, including mobile loading, continue to use the designated alternative vehicle route as the safety-class vehicle barriers remain inoperable (see 11/16/2018 report). N3B personnel completed the design and work package for returning the vehicle barriers to service; however, their attempt this week to begin the repairs was thwarted when a necessary tool was not available.

Plutonium Facility–Work Control: Last week, a four-person work crew was found to have contamination on their booties after two members of the crew alarmed the hand and foot monitors at the facility exit. There was no skin contamination. The crew had been investigating a potentially degraded glovebox spool piece in a plutonium-238 processing room. Another worker not involved with the job was also found to have contaminated booties. The work crew had been wearing respirators and two pairs of anti-contamination clothing in the work area. When departing the work area, they doffed their outer coveralls and surveyed, but did not remove, their outer booties. Follow-up surveys discovered a contamination spread in the room, which is being decontaminated. No airborne radioactivity related to this contamination spread was detected. The spool piece currently has a temporary confinement barrier installed while engineers evaluate options for a longer-term replacement.

Readiness: On Wednesday, Triad personnel executed their process to determine the appropriate level of readiness review for two new activities. They determined that resumption of a pinch welding operation at the Weapons Engineering Tritium Facility requires contractor and federal readiness assessments. They determined that a new pit cutter in the Plutonium Facility, which will use a cutting tool similar to a pizza wheel, constituted an expansion of an existing capability and does not require a formal readiness review. The team considered the new operation to be similar to an existing robotic lathe.

Chemistry and Metallurgy Research Building: Last Thursday, the NNSA Field Office approved a temporary modification to the safety basis in support of the next phase of processing activities associated with americium-241 materials received from an off-site location (see 5/25/2018 report).

Transuranic Waste Facility: Last month, Triad management sent the NNSA Field Office an update to the project execution schedule in support of reclassifying the fire suppression system to safety significant. The schedule indicates that the system will be implemented by April 30, 2019.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 21, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending December 21, 2018

Plutonium Facility–Work Control: Last Friday, facility management issued a new standing order applicable to all work performed in gloveboxes. The order requires that all glovebox workers use cut/puncture resistant over-gloves or additional tools when working with or generating sharps. Any deviation from this requirement must be granted in writing. The standing order will remain in place until longer term implementation initiatives regarding sharps are determined.

Plutonium Facility–Operations: Last Tuesday, workers drumming out gloves from a glovebox line noted liquid in the box. They determined that a valve in the box on a sodium hydroxide solution line had been bumped. More than 100 liters of solution entered the box. The criticality safety analysis for this box does evaluate the fully flooded condition and there was no nuclear material other than contamination in the box at the time. The work crew vacuumed the solution into tanks in a nearby glovebox. However, these tanks were designed for acidic solutions and have gaskets that are not recommended for use with sodium hydroxide. Therefore, this week the solution was moved via two liter bottles to tanks in another room with compatible materials.

Plutonium Facility–Safety Basis: Two weeks ago, safety basis personnel performing an unreviewed safety question screen of a waste analysis plan for treatment of radiologically contaminated magnesium perchlorate entered the new information screening process. They noted that the currently approved Documented Safety Analysis states that perchlorate salts are no longer present in the facility. This Monday, Triad personnel determined that this constituted a potential inadequacy of the safety analysis. The material is currently stored in a metal can and will be moved to the Chemistry and Metallurgy Research building for treatment next year.

Last Tuesday, Triad Safety Basis personnel provided to the NNSA Field Office for concurrence a revised project execution plan for updating and improving the Plutonium Facility safety basis (see 9/15/2017 report). The key change in the new plan is including revisions to bring the safety basis into compliance with DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*. This will be done concurrently with the modeling updates. The plan proposes submittal of the new safety basis and updated accident analysis to the NNSA Field Office in March 2022.

Last Friday, Triad submitted to the NNSA Field Office the evaluation of the safety of the situation and justification for continued operations for the potential inadequacy of the safety analysis associated with the biokinetic solubility of plutonium-238 oxides (see 8/17/2018 report). The new proposed compensatory measure eases the existing one by using an intermediate solubility for oxides that have not been high fired. They originally entered this issue into the new information screening process on July 19, 2018, declared a potential inadequacy of the safety analysis on August 15, 2018, and then determined the issue constituted a positive unreviewed safety question on September 9, 2018. DOE Guide 424.1-1B provides timeliness expectations for these steps because the safety basis is outside the envelope approved by DOE.

Emergency Management: Triad personnel continue efforts to improve emergency communications across the site (see 10/5/2018 report). They have conducted radio and cellular signal surveys at several identified critical communications areas including the TA-55 Operations center and the Weapons Engineering Tritium Facility. The results of these and future surveys will be used to prioritize communications upgrades. A cellular signal booster was recently installed at the Emergency Operations Center, and a radio signal booster will be installed early next year.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 28, 2018

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending December 28, 2018

The Year on a Page: A summary of the key developments of 2018.

- N3B and Triad assumed operational responsibility for their respective EM and NNSA mission scopes at LANL. Both companies have begun executing actions to strengthen formality and organizational learning within their operations.
- For the first time since 2014, Area G personnel were able to reduce their aboveground nuclear material inventory by mobile loading transuranic waste for disposition at the Waste Isolation Pilot Plant. Plutonium Facility personnel also executed a mobile loading shipment in order to maintain proficiency. Both organizations hope to increase the frequency and reliability of transuranic waste shipments through the restart early next year of indoor loading operations at the RANT Shipping Facility.
- The Transuranic Waste Facility received about 370 waste containers alleviating storage locations that were approaching capacity at the Plutonium Facility and Chemistry and Metallurgy Research building. Facility personnel continue into their second year of efforts to replace the seismic switches, upgrade the fire suppression system to safety significant, and convert the dry pipe system from nitrogen to air. They also plan to complete installation and achieve authorization for the waste characterization capabilities that were previously removed from the project's scope.
- A Plutonium Facility worker received an uptake of plutonium-238 after a wire cable strand punctured a worker's glovebox glove and embedded plutonium into the hand. Although the accident investigation report awaits final approval, management has taken action to strengthen sharps safety. Additionally, they have instituted new training on contaminated systems and glovebox safety as part of previously planned corrective actions from multiple radiological contamination events.
- After nearly three years of planning, NNSA awarded a contract to an outside vendor to conduct a three-year program of column capital testing and commenced a separate, but related, initiative to perform a non-linear dynamic analysis of the Plutonium Facility. Per the Board's letter dated December 17, 2014, these efforts are essential to make sound technical determinations regarding the necessity for any additional structural modifications.
- Weapons Engineering Tritium Facility (WETF) personnel successfully loaded tritium onto a hydride transport vessel for the first time in approximately a decade. This process is essential to support risk-reduction by removing significant quantities of legacy tritium from the facility that are no longer needed for programmatic purposes.
- After two years of development, WETF personnel received approval of a safety basis addendum to support safely venting the Flanged Tritium Waste Containers that may be pressurized with an explosive mixture of oxygen and hydrogen isotopes. They plan to complete readiness activities and execute the campaign early next year. NNSA and Triad will then need to coordinate with EM and N3B in order to address similar containers currently stored in a shed at Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 4, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 4, 2019

Inclement Weather: The laboratory remained closed for two additional days following the holiday closure due to heavy snowfall.

Weapons Engineering Tritium Facility–Readiness: Last month, Triad transmitted their second quarter fiscal year (FY) 2019 Startup Notification Report to the NNSA Field Office. The new report changes the recommendation for the level of readiness review for the movement and venting of the Flanged Tritium Waste Containers (FTWC) with potentially explosive headspaces. The predecessor contractor had previously proposed a contractor readiness review for this activity. Triad’s new report withdraws the recommendation for a formal readiness assessment and states that a safety basis Implementation Verification Review and management self-assessment are sufficient. The stated basis for this change is an assertion that ignition of the potentially flammable oxygen and hydrogen isotope mixtures within the FTWCs is not credible during the venting operation. However, we note that the recently approved safety basis addendum (see 11/30/2018 report) includes credited controls to prevent a FTWC from tipping as it states a complete tip cannot be excluded as an energy source for ignition. The startup report also included the recommendation for a federal readiness assessment for the startup of the Pinch Welder (see 12/14/2018 report).

Plutonium Facility–Infrastructure: On December 20, 2018, Triad management transmitted the annual revision of the TA-55 Project Execution Strategy (PES) to the NNSA Field Office for information. The predecessor laboratory contractor originally developed the PES in August 2011 as deliverable 5.4.5 in support of the Board’s Recommendation 2009-2. The PES describes the strategy, cost, scope, schedule, and identified funding sources for the upgrades the contractor has identified as necessary to ensure that the mitigated consequences from a seismically-induced accident at the facility will no longer challenge the DOE Evaluation Guideline of 25 rem. The PES revision notes the tangible progress that has been achieved since 2011, highlights recommended scope for this fiscal year, and sets out-year goals.

Some of the proposed scope for this FY continues efforts started last year (see 1/5/2018 report), including completion of the following: installation of the generators and transfer equipment for the electric firewater pumps; designs to remedy seismic interaction issues with the fire suppression system; and continued development of fire hazard evaluations and seismic analyses for gloveboxes. While the PES has resulted in many infrastructure improvements, some upgrades to key safety systems have experienced delays due to unexpected engineering challenges, funding perturbations, and reprioritizations for emergent scope as the facility seismic analyses progressed. For example, the current schedule estimates show slippages compared to the baseline projections as follows:

- 11 years for the upgrade of the fire suppression system to seismic performance category (PC)-3, now estimated for completion in FY-24
- 6 years to complete modifications to ensure laboratory walls provide a 2-hour fire barrier, now estimated for completion in FY-21
- 5 years to achieve a PC-3 active confinement ventilation capability and replace the fire alarm system, now both estimated for completion in FY-25
- 4 years to separate the non-seismically qualified buildings from the firewater loop, now estimated for completion in FY-26

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 11, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 11, 2019

Area G: On Tuesday, the EM Field Office approved a one-time variance to the technical safety requirements for Area G in order to allow snow removal equipment into the locations with inoperable safety-class vehicle barriers (see 11/16/2018 report). The variance required N3B to keep all waste storage areas in the impacted areas in warm standby mode and have a spotter in contact with the snow removal equipment at all times. On Wednesday, a worker returned into the vehicle restricted area with snow removal equipment without a spotter in order to clean up another patch of snow. This was observed by the shift operations manager who promptly paused work. N3B management determined this constituted a violation of the technical safety requirements. They also decided to conduct an apparent causal analysis on this and a number of recent similar events.

On Monday, N3B personnel observed that two waste storage domes were damaged by recent snow accumulation. The snow load resulted in bent and broken structural cross members, bent cross member brackets, and bent conduit. Existing tears in the dome fabric also expanded allowing snow to enter the waste domes. The dome structures do not have a credited safety function. The safety basis treats the domes as light construction so impacts from lightweight falling structural members on waste drums are not considered. However, there are heavier black steel fire suppression pipes supported by the affected dome structures.

Federal Oversight: This week, NNSA and EM released the 2018 performance evaluation reports for their contractors. NNSA noted the following relevant points for their fiscal year 2018 contractor:

- LANS completed planned improvements to conduct of operation in the Plutonium Facility, but progress was inconsistent to improve construction and maintenance activities.
- LANS was not fully effective in supporting the transition of the N3B.
- Poor housekeeping and operational practices in the Plutonium Facility exacerbated material control and accountability issues.
- The quality of nuclear criticality safety evaluations had improved, but inconsistent limit sets were creating implementation challenges.
- LANS worked collaboratively with the NNSA Field Office to enhance tracking and oversight of safety basis documents and coming nearer to meeting emergency management requirements.

EM noted strengths for N3B including safety culture, readiness of mobile loading operations, and the operational standup of Area G. They noted relevant areas for improvement including data and quality programs, issues management, and timely revision of blue sheeted procedures.

Accident Investigation: On Monday, NNSA and Triad personnel commenced a joint investigation of an accident that severely injured a sub-contracted construction worker in a non-nuclear activity on December 19, 2018.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 18, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 18, 2019

Plutonium Facility–Issue Recurrence: On Monday, facility management entered a limiting condition for operations after system engineers performing a surveillance determined that conflats containers were incorrectly listed in the tracking system as a type certified to reduce the damage ratio in certain accident scenarios. This issue is similar to a previous occurrence that prompted considerable corrective actions that apparently were not fully effective (see 4/25/2015 and 11/6/2015 reports). For this instance, management elected to reinforce awareness of certified container types in upcoming briefings and study whether container names or types could be further refined to reduce error traps for the workforce.

Area G: Repairs to the out of service safety class vehicle barriers (see 11/2/2018 report) are on hold pending procurement of additional wire cabling. As the planned vendor is not Nuclear Quality Assurance-1 qualified, N3B personnel are developing a commercial grade dedication package and Technical Evaluation Acceptance Plan to ensure the procured cabling will meet safety class quality assurance requirements.

On Tuesday, N3B requested another one time variance to allow snow removal equipment into the area where vehicles are restricted. The controls are the same from last week. The variance was not used as the snow melted prior to approval from the EM Field Office. Of note, this variance explicitly noted that any violations of the controls would be equivalent to a violation of the technical safety requirements.

Waste Characterization Reduction and Repackaging Facility: On Thursday, facility management entered the New Information process after reviewing results of non-destructive assay measurements. The measurements, performed in late November 2018, indicate the possibility that a 55-gallon drum placed in an 85-gallon drum currently located within the glovebox enclosure may contain materials that exceed the radionuclide limit for transuranic waste, a condition that is prohibited by the safety basis. However, this determination is difficult because the measurement uncertainty and possibility that the radionuclides are actually associated residual contamination in the enclosure (the safety basis assumes that the residual contamination levels are less than 10 percent of the Hazard Category 3 limit). Based on anecdotal reports and visual confirmation, the nested drums have been in their present location for at least 20 years, do not have their lids, and contain vermiculite and plastics materials possibly associated with previous cleanup attempts of a nearby hydrocarbon spill. The facility remains in COLD STANDBY mode and management initiated planning for improved radiological characterization of the enclosure and the drum. The overall future of the facility remains under study.

Weapons Engineering Tritium Facility: Last Friday, the NNSA Field Office approved the annual update for the safety basis. This annual update was intended to consolidate previously approved changes into one document. NNSA included one condition of approval which directed incorporation of open comments from their review of this revision be incorporated in the next annual update.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 25, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 25, 2019

DNFSB Staff Activity: D. Andersen, R. Jackson, Y. Li, and P. Migliorini met with Triad engineering personnel to review plans for upcoming column capital testing and advanced seismic modeling of the Plutonium Facility. They also walked down the Plutonium Facility.

Safety Basis: On Tuesday, the NNSA Field Office approved Triad's schedule to update safety bases for the defense nuclear facilities to comply with DOE-STD-3009-2014. The schedule shows Triad submittals compliant with this standard are expected for the Radiological Laboratory Utility Office building in fiscal year (FY) 2019, the Plutonium Facility in FY-22, the Weapons Engineering Tritium Facility in FY-22, the RANT Shipping Facility in FY-24, and the Transuranic Waste Facility in FY-26.

Plutonium Facility–Error Likely Situation: On Thursday, the resident inspectors and visiting staff observed a floor storage location in a laboratory processing room that contained a backlog of about 80 individual containers of special nuclear material awaiting disposition by the transuranic waste organization. The consequence of this situation is that any material transfer associated with this location requires workers to verify information for each of the containers—a time consuming and error likely situation. This large number of containers also increases the area radiation exposure hazard to the workers.

Weapons Engineering Tritium Facility–Readiness: On Tuesday, the NNSA Field Office approved Triad's recent startup notification report (see 1/4/2019 report) that rescinded formal readiness review requirements for the venting of the Flanged Tritium Waste Containers that contain potentially explosive headspace mixtures of oxygen and hydrogen isotopes.

Chemistry and Metallurgy Research Facility: Last Friday, the NNSA Field Office unconditionally approved the annual update to the safety basis. However, the approval letter noted three points associated with outdated information and requested these be addressed in the next annual update. The points included: (1) referencing an obsolete version of DOE Order 420.1C, *Facility Safety*; (2) using local population data from 2005 rather than the most recent census data obtained in 2010; and (3) using wind data from 1999 and 2006 contrary to the statement in DOE-STD-3009 that states methodology should be consistent with Nuclear Regulatory Commission specifications indicating that the wind data should not be older than 10 years.

Plutonium Facility–Safety Basis: Last Wednesday, the NNSA Field Office approved a revision to an Evaluation of the Safety of the Situation (ESS) originally developed in 2015 (see 9/4/2015 report) regarding pipe overpack containers (POC). The revised ESS incorporates recent DOE guidance based on experimental testing indicating that POCs with a certain plastic replacement filter installed on their outer container can be considered to have a damage ratio of zero for credible fire scenarios. Triad expects to replace all affected POC filters by December 2019. The field office noted that Triad's request to extend the expiration date of the ESS for two years was contrary to DOE expectations, agreed that replacement of filters on the outdoor storage locations was the correct priority, and requested quarterly updates via email on the progress of filter replacements.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 1, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 1, 2019

Plutonium Facility–Infrastructure: A water main leak on Tuesday morning caused a potable water loss to most of Technical Areas 35, 50, and 55, including the Plutonium Facility. Fire suppression water for the Plutonium Facility was not impacted since it is supplied from dedicated storage tanks adjacent to the facility. However, facility management curtailed operations at the Plutonium Facility and the Radioactive Liquid Waste Treatment Facility due to the lack of water for safety showers, eye washes, and decontamination. Utilities personnel restored water service Tuesday evening.

Plutonium Facility–Worker Safety: Last Tuesday, two electricians were inadvertently locked inside a caged storage location for approximately 40 minutes. During this time, the workers would have been unable to properly respond to alarms associated with a nuclear criticality, an airborne radioactive material release, fire, or other emergency situations requiring egress. Triad management held two fact-finding reviews to review this event and determine corrective actions, which include: conducting a pre-job briefing that integrates overlapping functions when multiple work groups are involved, conducting an extent-of-condition review of other locations that may need modifications for life safety egress, and examining use of a lock-out/tag-out process for entry into these types of areas.

Plutonium Facility–Safety Basis: On Wednesday, facility management entered the New Information (NI) process to determine whether the hazards analysis considers failures of the freight elevator and a programmatic dumbwaiter while transporting material-at-risk.

Plutonium Facility–Radiological Control: On Monday, facility management conducted a fact-finding after a worker's bootie was found to be contaminated during self-monitoring at the facility exit. Participants discussed potential improvements to the control of hot job exclusion areas (see 12/14/2018 and 9/1/2017 reports). Separately, management is considering options to strengthen monitoring of known contamination areas, including a room with a wall of legacy gloveboxes previously used for plutonium-238 operations but unused for at least the last 20 years, the room where the significant contamination event occurred in 2017, and the area of the basement that was subjected to flooding late last year.

Plutonium Facility–Readiness: A nine member NNSA team performed a readiness review for restart of the Uranium Electrolytic Decontamination process.

Area G: On Tuesday, N3B management declared a violation of the Technical Safety Requirements following discovery of a prohibited vehicle outside of the designated travel route in place until the safety-class vehicle barriers are restored (see 11/16/2018 report). On Monday, N3B entered their NI process to evaluate the apparent discrepancies in the safety basis between material-at-risk assumptions for the overall waste inventory and those used for individual accident scenarios.

Transuranic Waste Facility: This week, facility management entered the NI process for two separate apparent discrepancies: (1) material-at-risk assumptions for sealed-sources and (2) dimensions and thicknesses for fire-rated safes.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 8, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 8, 2019

Plutonium Facility–Accident Investigation: Last week, the LANL Director signed the final investigation report (LA-UR-19-20258) from the August 2018 event where a worker received a puncture wound during glovebox cable maintenance that resulted in an intake of plutonium-238 (see 9/7/2018 report). Overall, the investigation team identified five judgements of need covering the following: (1) inadequate management implementation of work control, training, and conduct of operations requirements; (2) inadequate performance steps in the work control document associated with the use of skill of the craft requirements; (3) inadequate management follow-up to eliminate the previously identified frayed wire hazard; (4) workers did not identify the need to pause work in accordance with procedures; and (5) management did not fully appreciate the injection hazard posed by isotopes with greater specific activity. Facility management is developing associated corrective actions.

Plutonium Facility–Nuclear Materials Management: This week, machining personnel began the process of moving containers of plutonium metal turnings to another room in the facility for stabilization. Multiple containers of turnings have been stagnant in the machining room since prior to the operational pause of the facility (see 7/4/2014 report). Processing the turnings creates a safer material form by eliminating the pyrophoric hazard and removes unnecessary material-at-risk from the machining gloveboxes.

RANT Shipping Facility–Readiness: On Monday, a thirteen member team commenced the contractor readiness assessment for the restart of the RANT Shipping Facility. Restart of this facility will restore the Triad’s capability to load transuranic waste for offsite shipment in an indoor environment thus avoiding the vagaries of weather that constrain outdoor mobile loading. This week, the team observed a performance demonstration of transuranic waste loading and conducted interviews. The performance demonstration also included an operational drill involving discovery of radiological contamination during surveys of the shipping container. The assessment is scheduled to complete next week. A federal readiness assessment team is scheduled to commence their review the week of February 18, 2019. The plan of action for the federal assessment was issued on Thursday.

Plutonium Facility–Readiness: The federal readiness assessment team for the Uranium Electrolytic Decontamination (UED) process issued their final report last Friday. The report recommends that upon correction of two pre-start findings and establishment of a corrective action plan to address two post-start findings, the UED process be allowed to restart in accordance with its startup plan. One pre-start finding was in the area of configuration management and involved the process for determining equipment management levels for quality assurance purposes. The second pre-start finding notes that the radiological work permit for UED operations is not consistent with site procedures. The post-start findings were both in the area of feedback and improvement and related to treatment of corrective actions from the contractor readiness assessment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 15, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 15, 2019

Plutonium Facility–Transuranic Waste Management: On Saturday, workers were replacing filters on the outer drums of pipe overpack containers (POC) with the new filters needed to support a damage ratio of zero for postulated fire scenarios (see 1/25/2019 report). The work crew inadvertently removed the filter from a 7A drum on the outdoor waste pad that did not contain a POC, but instead contained bagged waste. Note that 7A drums are used as the outer container on POCs making them visually indistinguishable. There was no contamination spread. Facility management paused this activity pending revision of the procedure to reduce the potential for errors.

RANT Shipping Facility–Readiness: On Monday, the contractor readiness assessment team completed their review and briefed the results to facility management. The team identified one pre-start and one post-start finding. The pre-start finding was that two doors were not configured in accordance with life safety code and could be locked from the outside. The post-start finding was to complete an updated industrial hygiene assessment as one has not been performed in more than five years. The team made positive observations on the thoroughness of the management self-assessment and the coordination between different organizations working at RANT. The pre-start finding was corrected before the end of the week and the federal readiness assessment will start next week.

Plutonium Facility–Safety Basis: On Tuesday, the NNSA Field Office issued a safety evaluation report unconditionally approving the contractor’s annual update to the Plutonium Facility’s safety basis (see 8/17/2018 report). This particular update addresses long-standing conditions of approval, many of which originated in 2008, and includes efforts to modernize the hazard analysis and consolidate multiple safety basis documents. The field office requested an implementation plan for concurrence within two weeks.

Area G–Safety Basis: On Monday, N3B safety basis personnel completed their New Information evaluation regarding the protection of material-at-risk (MAR) assumptions for mobile loading operations (see 2/1/2019 report). They concluded that there was no potential inadequacy in the safety analysis and that MAR limits for non-combustible waste types during mobile loading do not need to be protected in the Technical Safety Requirements. Their justification was that conservatism in the development of the composite source term used for site-wide accidents exceed the uncertainties associated with the unprotected distribution of non-combustible wastes during mobile loading.

Chemistry and Metallurgy Research (CMR) Building–Nuclear Criticality Safety: On Tuesday, workers opened a legacy item retrieved from the vault and encountered a liquid when they were expecting a solid compound based on the label information. They had opened the item in a location where liquids were prohibited by the criticality safety posting. Subsequent to discussion with their supervisor, they moved the item to another location in the facility for non-destructive assay. At the fact-finding, NNSA Field Office personnel questioned why the workers and their supervisor did not respond in accordance with the procedure for process deviations and waited approximately five hours before notifying the operations center. CMR management plans to reinforce expectations for response to process deviations and conduct an extent-of-condition review to strengthen planning for future legacy item processing activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 22, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 22, 2019

The laboratory was closed on Tuesday due to snow.

DNFSB Activity: On Wednesday, Board Member Santos visited the laboratory accompanied by staff members J. Gilman, P.J. Migliorini, and C.J. Roscetti. Mr. Santos met with senior leadership from the NNSA and EM Field Offices and their contractors. He also walked down the Plutonium Facility, Weapons Engineering Tritium Facility, and Area G. On Thursday, the Board conducted a public hearing in Albuquerque that included the EM and NNSA Los Alamos Field Office Managers as panelists. The subject of the hearing was the new DOE Order 140.1, *Interface with the Defense Nuclear Facilities Safety Board*.

RANT Shipping Facility–Readiness: On Thursday, a five member federal team completed their two-day readiness assessment for restart of the RANT Shipping Facility. Overall, they concluded that the facility is ready to safely operate with no pre-start or post-start findings. They further noted that LANL continues to demonstrate excellence in its achievement of readiness.

Transuranic Waste Management: With the RANT Shipping Facility nearly ready to operate and provide all-weather loading capability, the critical path for resuming risk reduction across the laboratory is the approval of transuranic waste streams for receipt at the Waste Isolation Pilot Plant. Currently, N3B has a limited population of containers that are approved for shipment, but they are still working with Triad management to develop arrangements to use RANT. Triad expects to receive approval in the next month for about 120 waste containers originating from the Confinement Vessel Disposition project. Triad expects approval of additional containers later this spring, which should facilitate improved optimization of shipment payloads

Transuranic Waste Facility (TWF): Last Wednesday, TWF personnel received their first shipment of 2019, which included 15 transuranic waste drums previously staged at the Plutonium Facility. The drums originated at the Chemistry and Metallurgy Research building. This brings the total inventory at TWF to 363 drums or about 30 percent of the facility’s overall capacity. While TWF has provided some relief, waste container storage locations at the Plutonium Facility remain at about 90 percent of their capacities.

On Wednesday, the NNSA Field Office concurred with Triad’s revised project execution plan to reclassify the TWF fire suppression system as safety-significant. The plan anticipates implementation of the revised safety basis by April 30, 2019. Separately, TWF engineering personnel are finalizing details for seismic qualification testing of the redesigned seismic power cutoff switches. They anticipate providing the NNSA Field Office with a revised schedule that reflects a slip from the directed completion date of January 14, 2019 (see 8/4/2017 report).

Area G–Safety Systems: N3B personnel have procured wire cabling to complete repairs of the inoperable safety class vehicle barriers (see 1/18/2019 report). Repair work is in progress and is being prioritized based on dome inventory and impacts to vehicle restrictions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 1, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 1, 2019

Federal Oversight: On Wednesday, NNSA Field Office management conducted the final oral board for a facility representative assigned to the Plutonium Facility. The final qualification walk-through occurred last week. The candidate successfully completed these evaluations bringing the total of fully qualified personnel assigned to facility representative duties up to two with one each assigned to the Plutonium Facility and the Weapons Engineering Tritium Facility. The field office has a pool of eight facility representatives in training to increase their field oversight capabilities.

RANT Shipping Facility: On Thursday, the NNSA Field Office approved restart of the facility. On Wednesday, subsequent to the transmission of a review agenda from the Board's staff, Triad personnel entered the New Information process to evaluate an apparent inconsistency in the damage ratios used in the safety basis in the analysis of payload drops.

Area G: On Wednesday, N3B management paused all operations after they learned that workers were executing the corrective maintenance on the safety class vehicle barrier cables in a manner inconsistent with the specified sequence. Engineering personnel are consulting with the vendor to confirm the acceptability of this alternate assembly method. This is N3B's third work pause in recent weeks. Following the current pause, management is releasing individual activities after the work documents are revalidated.

Plutonium Facility–Transuranic Waste Management: Based on current waste storage utilization levels of about 90 % of capacity, Triad management has begun tapering certain residue generating activities from lower programmatic priority activities such as vault cleanout. Some residue generating activities, such as metal production, continue and are maximizing use of floor storage locations for their residues. During the next month, Triad management plans on executing multiple shipments to the Transuranic Waste Storage Facility to alleviate the situation and reduce the amount of waste in the facility.

Plutonium Facility–Safety Basis: On Thursday, Triad management transmitted to the NNSA Field Office for concurrence an implementation plan for the recently approved updated safety basis (see 2/15/2019 report). The plan anticipates declaration of implementation on or before December 20, 2019. Implementation will involve changes to approximately 99 procedures, associated training, and conduct of a major implementation verification review. The plan notes that implementation may need to be phased as a result of unknown completion dates for certain related key projects that include: MAR Tracker software update, installation of automatic transfer switches for the diesel generators that support the electric firewater pumps, and installation of the modern chlorine gas delivery system. Triad also informed the field office that they anticipate the need to submit a revision to this safety basis to support operational flexibility and correct previously identified issues, including the inadvertent omission of a process description for a needed activity.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 8, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 8, 2019

DNFSB Staff Activity: R. Davis and P. Migliorini were on site to review the safety basis for the RANT Shipping Facility.

Transuranic Waste Management: This week, as part of the initiative to alleviate waste accumulation challenges at the Plutonium Facility, Triad personnel executed three shipments to the Transuranic Waste Facility (see 3/1/19 report). Overall, they transferred 98 containers, which included a shipment of 40 containers representing the largest single batch received to-date. Triad personnel continue working with the Carlsbad Field Office to obtain approval to send containers to the Waste Isolation Pilot Plant (WIPP). There are now several hundred containers from two different waste streams that have obtained some of the necessary approvals.

Plutonium Facility–Safety Basis: Last Friday, the NNSA Field Office approved Triad’s evaluation of the safety of the situation (ESS) for the positive unreviewed safety question (USQ) related to biokinetic solubility of heat source plutonium (see 12/21/2018 report). The approval notes that the analysis is reasonably conservative and that references not included in the ESS provide an adequate basis to use the Type S dose conversion factor for all oxides fired above 800 °C for two hours. Oxides and some other compounds that have not undergone this heat treatment will continue to use an intermediary dose conversion factor between Type S and M. The approval contained one directed action to revise the ESS to include Technical Safety Requirements for the new material-at-risk limits. The Board’s staff await interaction with Triad and the NNSA Field Office on questions concerning the technical validity of this approach.

Last Thursday, Triad safety basis personnel concluded that the potential inadequacy of the safety analysis related to transportation of nuclear material in the Plutonium Facility’s freight elevator constitutes a positive USQ (see 2/1/2019 report). The currently analyzed drop height for a container falling from a vault shelf does not bound the height from a fall due to an elevator failure. As a compensatory measure, management directed that all nuclear materials conveyed using the elevator or dumb waiter are to be packaged in accordance with existing requirements.

Chemistry and Metallurgy Research Building: On Wednesday, safety basis personnel entered the New Information process to evaluate transportation of nuclear material in the elevators after determining the positive USQ for the elevator in the Plutonium Facility.

Area G: Last month, the EM Field Office and N3B approved the performance based incentives for fiscal year 2019. Notable activities include: restart two processing lines to sort, segregate, and size reduce transuranic waste; utilize these lines to remediate 192 containers in preparation for disposal at the WIPP; reconfigure Area G access and radiological controls; implement N3B’s new safety management programs; and develop and begin executing a strategy to create a new safety basis.

Worker Safety: Last week, workers lost control of a laser table weighing about a metric ton while moving it into a laboratory in the Radiological Laboratory Utility Office Building. On Thursday, Triad management commenced a team investigation after identifying a recent trend in rigging incidents.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 15, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plau and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 15, 2019

Chemistry and Metallurgy Research (CMR) Building–Conduct of Operations: During the past year, operators had been retrieving items from tube vaults in the floor of Wing 9, repackaging them into various shipping containers, and returning them to the floor space above the tube vaults. Last Friday, a relatively new operator appropriately questioned whether the criticality safety limit approval allowed him to store the shipping containers on the floor, given that the limits are specified as “per floor hole location.” Nuclear criticality safety personnel determined that situation was safe and stable and recommended categorizing the infraction as a level-1 non-compliance. Their procedures define a level-1 non-compliance as an operation conducted with fissionable material such that a criticality safety evaluation would have been required, no analysis has been conducted, and no credited controls are in place. Triad management conducted two fact-findings this week that revealed significant weaknesses in conduct of operations, training, and implementation of the nuclear criticality safety program. Given these and other recent issues (see 2/15/2019 report), Triad management paused Chemistry Division activities in CMR, the Plutonium Facility, and the Radiological Laboratory Utility Office Building pending corrective actions.

Plutonium Facility–Radiological Safety: Last Thursday, while changing gloves on a glovebox used for plutonium-238 aqueous processing, an operator inadvertently lost control of the gloves resulting in contamination levels in excess of the monitoring instrument’s range to a large portion of the protective clothing covering his arm. All workers involved were wearing air purifying respirators and there were no indications of an uptake. At the fact-finding, Triad managers noted the remarkable response of the radiological control technicians who were able to fix the contamination and remove the protective clothing from the worker without further spreading contamination. Management also directed further study on opportunities to improve the glove change process to avoid this problem, which had occurred previously a few years ago. The resident inspectors note that radiation protection personnel continue to pursue routine use of powered air-purifying respirators (PAPR) for these types of high-hazard jobs. PAPRs offer workers greater comfort and better respiratory protection. The primary impediments to deployment include locating storage space and completing necessary training.

Plutonium Facility–Safety Basis Compliance: On Tuesday, Triad personnel conducted a fact-finding to learn from an unplanned entry into the limiting condition for operations associated with an exceedance of the material-at-risk (MAR) limits for the outdoor transuranic waste storage pads that occurred last Wednesday. Fact-finding personnel discussed issues with the formality of procedural execution used to pre-check limit compliance ahead of material movements, as well as human performance concerns associated with the MAR Tracker software. In particular, Triad personnel noted that MAR Tracker has necessitated numerous work-arounds since about 2015. For example, the current MAR surveillance procedure requires about 60 separate manual data manipulations. Fact-finding personnel determined that some of these data manipulations were skipped resulting in an inaccurate result for the pre-check conducted last week. Updates to MAR Tracker to eliminate these manipulations have been underway for nearly a year and are expected to be implemented in about a month.

Severe Weather: On Wednesday, the laboratory experienced snow and high winds prompting Triad management to declare a discretionary emergency. They staffed the Emergency Operations Center for several hours to improve response to many downed trees and power outages.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 22, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 22, 2019

Emergency Management: On Monday, Emergency Management personnel restored full operability of the Emergency Operations Center (EOC). At the end of January, they declared portions of the primary and secondary EOC rooms inoperable due to safety concerns following damage to one of the safety glass panes in the glass partition wall between the rooms. Alternative locations remained available to continue EOC Operations. Late last week, utilities and infrastructure personnel taped the damaged pane to prevent further degradation; a new pane is on order. The EOC activation last week for severe weather was able to use the alternate primary location. A structural evaluation to determine why this glass was damaged is in progress.

Plutonium Facility–Conduct of Operations: On Monday, Plutonium Facility management implemented a new standing order to augment programmatic requirements for the person in charge (PIC) program and to apply new expectations for performance of the reader worker method. The first new requirement states that PICs are not allowed to perform hands on work for tasks involving processing greater than 500 g of special nuclear material, processing heat source plutonium, or during high hazard work. The second requirement mandates that use every time Detailed Operating Procedures or Integrated Work Documents for operations involving processing heat source plutonium or greater than 500 g of special nuclear material be performed using the reader worker technique.

Transuranic Waste Facility (TWF)–Safety Basis: On Monday, the NNSA Field Office issued a Safety Evaluation Report approving the annual update to the TWF Safety Basis with no conditions of approval. This annual update addresses a condition of approval from NNSA’s 2016 safety basis approval (see 12/9/2016 report). The prohibition on receipt of pipe overpack containers has been removed and the new safety basis includes performance criteria for pipe overpack containers.

Area G: Last Friday, the Environmental Management Field Office (EM-LA) transmitted the new, unapproved safety basis for Area G to N3B. This safety basis was prepared by a subcontractor directly for EM-LA office prior to N3B assuming control of the Los Alamos Cleanup Contract (see 3/23/2018 report). The contract stipulated that EM-LA would provide N3B with an approved safety basis for use at Area G. However the prepared document does not align with current contract direction to N3B and their technical approach to the Area G mission. Therefore, EM-LA provided the unapproved safety basis to N3B along with their review comments with the direction that N3B initiate a new update of the Area G safety basis consistent with their current project direction and technical approach.

Last week, N3B personnel resumed repair work to restore the safety class vehicle barriers to service (see 3/1/2019 report). This week, they paused again following discovery that a change adding use of a new tool to the Integrated Work Document was made following the initial unreviewed safety question (USQ) evaluation. The Integrated Work Document did not go back through the USQ process after this change. A USQ evaluation is currently in progress and work on the barriers is expected to resume shortly.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 29, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plau and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 29, 2019

Weapons Engineering Tritium Facility (WETF)–Conduct of Operations: Last week, WETF personnel improperly executed a rearrangement of the Flanged Tritium Waste Containers (FTWC) in preparation for venting operations. The safety basis addendum that supports FTWC movement and venting includes Specific Administrative Controls (SAC) associated with a lift height restriction and lookout in order to preclude toppling and possible ignition of potentially flammable headspace mixtures of oxygen and hydrogen isotopes. WETF management implements these SACs using two procedures. The work crew determined that the FTWC movement procedure did not support rearrangement and chose to use an inappropriate work document that did not include the SACs; however, the crew stated that they nonetheless implemented the SACs. Subsequent to commentary from a member of the NNSA Field Office, WETF management preliminarily concluded that this event did not constitute a violation of the Technical Safety Requirements (TSR) because of the verbal statement that the SACs were implemented. Reliance on verbal implementation is contrary to DOE-STD-1186, *Specific Administrative Controls*, which states, “SACs are implemented to control facility operations using formally controlled procedures.”

Transuranic Waste Management: N3B was unable to capitalize on their allocated shipment from Area G this week because the Waste Isolation Pilot Plant (WIPP) mobile loading team sent a key member that was unfit for work in a radiological environment due to an open surgical wound. They will try again next week. The mobile loading team is part of Triad’s Repository Science and Operations program that supports the DOE Carlsbad Field Office. On Thursday, Triad received the complete set of approvals to send 19 drums to WIPP. They expect additional approvals to be forthcoming and are planning the first shipment from RANT for next month.

Transuranic Waste Facility (TWF): On Tuesday, TWF management declared a TSR violation after workers recognized that they failed to properly execute a surveillance on material-at-risk prior to moving containers into a waste storage building. The TSR surveillance protects an initial condition used in the safety analysis. At the fact-finding, personnel indicated that Waste Compliance and Tracking System (WCATS) records showed personnel had double scanned three drums and skipped scanning three other drums. TWF personnel discussed improvements to the formality of the surveillance, WCATS device network connectivity concerns, and questions on WCATS apparent inability to flag errant movements. TWF management plans to implement standing orders for all facilities that use WCATS and notify N3B.

Plutonium Facility–Safety Systems: On Saturday, during quarterly preventive maintenance on the safety class uninterruptable power supply (UPS), the system shut down and the facility lost power for a few minutes. Facility operations personnel restored all the systems impacted by the outage and entered the appropriate limiting condition for operations due to inoperability of the UPS. The cause of the shutdown is not yet known, and troubleshooting is in progress.

Conduct of Operations: Triad management has released Chemistry Division activities in the Plutonium Facility and the Radiological Laboratory Utility Office Building following validation of safety management program implementation and management walk-downs. Chemistry Division activities in the Chemistry and Metallurgy Research building remain paused (see 3/15/2019 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 5, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaué and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 5, 2019

Flanged Tritium Waste Containers (FTWC): On Friday, Weapons Engineering Tritium Facility (WETF) personnel successfully vented the first of three FTWCs that have the potential for headspaces with a flammable mixture of oxygen and hydrogen isotopes. This is an important milestone in resolving a safety issue that was discovered in 2016 (see 9/9/2016 report). WETF personnel found that the inner contents had not leaked and plan to disposition them prior to venting the remaining two FTWCs of concern located in that facility.

The NNSA and EM Field Offices continue to deliberate on the fate of the FTWCs currently located at Area G. The primary question is whether the FTWCs should be vented *in situ* prior to transportation back to WETF for final disposition. Once a decision is reached, additional work will be needed to solidify the technical approach, schedule, safety basis, and roles and responsibilities.

Plutonium Facility—Conduct of Operations: In response to an observed uptick in the number and severity of potential process deviations, Triad management initiated a safety pause to brief all fissile material handlers. The briefing emphasized that 16 of 18 potential process deviations that have occurred in calendar year 2019 resulted from errors associated with executing the material movement process. Managers solicited feedback and workers provided a number of opportunities to improve the material movement process. The one-hour briefing also emphasized recent standing orders intended to enhance procedural execution and control of sharps (see 3/22/2018 and 12/21/2018 reports).

Transuranic Waste Management—Inconsistencies: The incidents at the Waste Isolation Pilot Plant in February 2014 and the Idaho National Laboratory in April 2018 demonstrated that improperly prepared transuranic waste can result in energetic events that release radioactive materials from drums in a manner that was not previously envisioned by DOE Standard 5506-2007, *Preparation of Safety Basis Documents for Transuranic Waste Facilities*. In the absence of DOE direction, safety basis personnel have inconsistently incorporated this information into the safety bases for the LANL nuclear facilities. For example, the safety basis for the Transuranic Waste Facility acknowledges the potential for an energetic release of radioactive material from a container with non-compliant waste could be 2–3 orders of magnitude greater than is analyzed per the DOE Standard 5506. As such, the NNSA Field Office directed development of a Specific Administrative Control to ensure only compliant waste is received at the facility (see 4/13/2018 report). A similar control does not exist at the Plutonium Facility, Chemistry and Metallurgy Research (CMR) building, and Area G—all facilities that handle transuranic waste in outdoor locations in the absence of engineered confinement.

Developments: N3B personnel successfully completed a mobile loading shipment of waste from Area G. CMR personnel executed their recovery plan and transferred the containers of fissionable materials to appropriate locations (see 3/15/2019 report). Plutonium Facility personnel restored operability to the uninterruptible power supply (see 3/29/2019 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 12, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 12, 2019

RANT Shipping Facility: Triad personnel resumed shipping operations of transuranic waste to the Waste Isolation Pilot Plant (WIPP) using the RANT Shipping Facility. The facility had been in cold standby since 2014. They moved the first shipment of 42 transuranic waste drums from the Transuranic Waste Facility (TWF) to RANT on Monday. The shipments were loaded into TRUPACT-II shipping containers on Tuesday and Wednesday then departed for WIPP on Thursday. The importance of restoring an indoor shipping capability for transuranic waste was evident this week as high winds associated with the explosive cyclogenesis event in the central United States curtailed outdoor operations at TWF, Area G, and RANT on Wednesday.

Weapons Engineering Tritium Facility: Triad personnel unloaded the inner containers from the Flanged Tritium Waste Container (FTWC) that was vented last Friday. Of the five inner containers, one was processed this week to reduce internal pressure. One container has exterior contamination indicating the potential for leakage. Facility personnel will continue to process these inner containers and plan to vent and unload the second FTWC in May.

Area G: On Tuesday, N3B personnel discovered a drum outside of a fire-rated safe labeled as containing 38 sources. Eleven of these sources are listed in a Specific Administrative Control in an Evaluation of the Safety of the Situation (ESS) which requires they be stored in a fire-rated safe when not in use. The workers immediately implemented a fire watch then opened the drum and performed a physical inventory per their source movement procedure. They discovered that the drum label was not fully accurate and there were thirteen sources that had to be moved into a safe. As these were placed into safes, an extent of condition review of sources listed in the ESS found several more that required movement. Facility personnel have completed these moves and are performing a broader extent of condition review on other types of sources. Facility management declared a violation of the Technical Safety Requirements due to the non-compliance with the ESS control.

Transuranic Waste Management–Inconsistencies: Transuranic waste can be staged in outdoor locations in proximity to vehicle traffic at the Plutonium Facility, the Waste Characterization Reduction and Repackaging Facility, TWF, RANT, and Area G. With the exception of the mobile loading operation at Area G, the safety bases for each of the last four of these facilities considers as part of the accident analysis a vehicle crash into waste containers and a subsequent fuel pool fire. While the analytical assumptions (e.g., number of breached containers) used in each of these analyses differ, the results identify the need for vehicle barriers to prevent such accidents. The accident analysis for the Plutonium Facility examines other types of accidents to outdoor transuranic waste, but it does not analyze a vehicle crash with subsequent fuel pool fire. As such, vehicle barriers are not used even though the material-at-risk is similar to the other facilities. In our opinion, this situation may warrant reconsideration at the Plutonium Facility as construction activities and associated heavy equipment traffic is increasing adjacent to the outdoor transuranic waste storage areas.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 19, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 19, 2019

DNFSB Staff Activity: Z.S. Beauvais and P.J. Migliorini were onsite to supplement routine oversight activities. On Thursday, a staff team conducted a teleconference with Triad and NNSA Field Office personnel to discuss the technical veracity of the recently approved evaluation of the safety of the situation concerning the biokinetic solubility of plutonium-238 materials (see 3/8/2019 report).

Worker Safety–Accident Investigations: Last month, Triad management approved corrective actions responding to the issues identified in the investigation report from the August 2018 event where a worker received an intake of plutonium-238 from a puncture wound (see 2/8/2019 report). As part of the process, they screened and developed actions for more than 50 issues associated with the judgements of need and opportunities for improvement identified in the report. Corrective action due dates range from some that have already completed to the end of September 2019. Notable corrective actions include: strengthening work planning processes for programmatic maintenance and facility construction; redesigning the cable crimp to eliminate the puncture hazard; replacing the locations that have inappropriate galvanized steel cabling with stainless steel or titanium; identifying similar hazards for all cable applications throughout the plant; evaluating training and qualifications for the person in charge position; evaluating the feasibility of a rapid bioassay methodology; and generating management observations verification guidance on work instruction usability.

On Thursday, the investigation team out-briefed the results of their review of the dropped load resulting in a near-miss at the Radiological Laboratory Utility Office Building and eleven other similar events that have occurred since 2016 (see 3/8/2019 report). The team recommended actions associated with strengthening lift categories and plan content, ensuring non-working supervision is present for all moderate and high hazard jobs, and enforcing better work pause, planning, and pre-job briefing practices. Notably, the team identified that many past corrective actions have not been applied systematically across the laboratory to address what are actually cross-functional/organization issues. As such, management decided to ensure that the final corrective actions were integrated with the corrective actions planned in response to the joint investigation of the sub-contracted construction event (see 1/11/2019 report).

Plutonium Facility–Conduct of Operations: This Tuesday, workers made an error in the material movement process while returning containers to the floor storage location in the processing room with a large number of individual special nuclear material cans (see 1/25/2019 report). They did not complete a step in the material movement procedure that requires verification that the database matches the physical configuration of the nuclear material. Performing this step should have caught the discrepancy between the database and physical configurations. There are currently 144 containers in this floor storage location, creating the potential for a lengthy verification process. Another team discovered the error the next day.

Area G: On Tuesday, N3B workers inadvertently parked a fueled vehicle in a combustible restricted area. Another worker questioned whether the entry had been authorized and logged by Operations Center personnel. As it had not, this constituted a violation of a Technical Safety Requirement for combustible liquid control. N3B management recognized this as repeat violation (see 10/12/2018 report) and recommended performing a formal causal analysis to prevent further recurrence.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 26, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 26, 2019

Nuclear Criticality Safety: Last week, Triad management sent the NNSA Field Office their plan to reduce the backlog of criticality safety evaluations. The plan notes that 211 of the 420 fissionable material operations at the laboratory currently have evaluations with compliance issues. After accounting for other needs, they developed a prioritized listing of 236 evaluations and plan to complete 98 of them this fiscal year. While the plan does not specify an overall completion date, Triad management is currently estimating completion in 2023. The plan discusses strategies to reduce workload including: eliminating NNSA Field Office approvals for evaluations produced to remove safety basis controls related to glovebox flooding; increasing emphasis on the identification of engineered controls; utilizing corporate reach-back to support development of operational requirements documents; developing a map of the Plutonium Facility indicating criticality safety limits in each location for use in planning material movements; and increasing use of standardized limit sets. The NNSA Field Office is reviewing the plan.

Chemistry and Metallurgy Research Building–Conduct of Operations: On Monday, Triad management released the majority of Chemistry Division operations from their pause following safety management program validations and walkthroughs (see 3/15/2019 report). Uranium operations and staging and storage activities remain paused. Formal causal analyses for the events that led to the pause are in progress.

Transuranic Waste Management: Senior leadership from Triad, N3B, and their field office counterparts recently met with the Carlsbad Field Office to strengthen the waste management plans for the laboratory. They identified a number of opportunities to improve integration, enhance shipping capability, and maximize risk reduction across the laboratory by optimizing payloads using NNSA and EM waste inventories. They plan joint communications to permeate this vision to their respective workforces and dissolve misconceptions. This week, N3B executed a successful mobile loading shipment. Last week, Triad successfully executed their second shipment from RANT.

Area G: Last week, N3B personnel restored all remaining safety-class vehicle barriers to operability and lifted the shift order on vehicle restrictions (see 11/2/2018 report).

Plutonium Facility–Conduct of Operations: Last Wednesday, facility personnel entered the limiting condition for operations for material-at-risk (MAR) after an individual performing trending analyses discovered a glovebox exceeded its limit for heat-source plutonium. Further investigation determined that a worker had mistakenly applied a multiplier on a material form, and the actual MAR present did not exceed the glovebox limit. This multiplier comes from the standing order issued in response to questions on biokinetic solubility of heat-source plutonium (see 9/7/2018 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 3, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 3, 2019

Radiological Laboratory Utility Office Building (RLUOB): Last Wednesday, facility operations personnel entered a service room and noticed a leak emanating from a valve on the radioactive liquid waste (RLW) system. Upon subsequent visual inspection by a radiological control technician, RLUOB engineers believe that this valve, and 6 similar valves, may be constructed of carbon steel. The RLW system handles radioactive liquid waste streams from chemistry operations that include nitric and hydrochloric acids—carbon steel valves would be incompatible with these solutions. The suspect valves are also in contact with stainless steel piping, which would create another corrosion mechanism. RLUOB management plans to drain the affected piping sections and develop a work package to replace all of the suspect valves. They will also confirm the valve materials and if shown to be incorrect, investigate the cause of this failure in the design, procurement, and installation processes. The valves were installed in 2013 as part of a modification to add straining and sampling capabilities that were not included in the original design.

Transuranic Waste Management–Inconsistencies: Facilities that handle transuranic waste often rely on 55-gallon containers as the sole barrier to the release of radioactive materials. A degraded container poses a direct risk to workers and may increase the risk to members of the public due to an inability to perform the function assumed in the safety analysis (e.g., supporting a damage ratio). The Technical Safety Requirements (TSR) documents at the various LANL facilities specify different responses to the discovery of a container with suspected degraded integrity. For example, the TSRs for the Transuranic Waste Facility (TWF) and the RANT Shipping Facility require a degraded container to be restored, overpacked, or removed from the facility; however, this action must be completed in 7 days at TWF and 14 days at RANT. The TSRs for the Plutonium Facility and Area G consider 55-gallon waste containers as a Design Feature and as part of safety management program, respectively. As such, the TSRs do not specify response actions and completion times, which are left to management discretion. The approaches at LANL contrast with other sites where TSR coverage ranges from non-existent to specific direction to immediately place the container in a safe configuration and overpack within 48 hours (i.e., Waste Isolation Pilot Plant).

Confinement Vessel Disposition Project: Last week, Triad personnel loaded the ninth confinement vessel into the enclosure. This is the last vessel known to contain nuclear material. Processing awaits repair of the dry chemical fire suppression system in the workstation.

Area G: This week, N3B marked the completion of its first year as the Los Alamos Legacy Cleanup Contractor. Their most significant accomplishment has been the resumption of mobile loading operations to ship transuranic waste to the Waste Isolation Pilot Plant. They completed seven waste shipments with the most recent being this Thursday. Other transuranic waste activities have yet to ramp up partly due to challenges in establishing business systems and safety management programs to support nuclear operations. These are starting to be rolled out now, and the operational tempo is expected to increase in the coming year as additional activities restart.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 10, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 10, 2019

DNFSB Staff Activity: The Resident Inspectors were in Washington, D.C. to brief the Board and attend meetings. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 17, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 17, 2019

Transuranic Waste Facility: During the course of implementing a safety basis update that upgrades the fire suppression system to safety significant, engineers determined that the current performance flow curve for the firewater pump does not meet the commissioning test curve as specified in the new Technical Safety Requirements. Facility engineers are currently troubleshooting the system and examining alternatives to the commissioning curve. The NNSA Cognizant Secretarial Officer previously directed the upgrade to the fire suppression system. The safety basis update is also needed to support the receipt of pipe overpack containers, which currently constitute the majority of waste containers awaiting removal from the Plutonium Facility. Additionally, the fire suppression system upgrade was intended to help relax combustible loading and spacing controls; however, these changes have not yet been incorporated into the safety basis. Facility personnel expect to complete later this summer the replacement of the seismic power shutoff system and the conversion of the dry-pipe system from nitrogen to air.

Plutonium Facility–Work Planning and Control: On Wednesday, facility personnel conducted a fact-finding after a pipefitter dropped a hot brazing rod and burned his lip. Fact-finding participants discussed several points of confusion regarding appropriate personal protective equipment including: the worker was wearing four sets of gloves (liners, nitriles, cut resistant, and welding), which was beyond the number specified in the work document; unclear eye and face protection requirements in the work document; conflicting institutional guidance on face protection for molten metal splash hazards; and subject matter experts who were unfamiliar with one of the institutional guides specific to construction work. The group also discussed difficulties associated with the timeliness of making changes to work packages. Facility management has paused all welding, brazing, and soldering activities until the work documents are corrected.

Plutonium Facility–Nuclear Criticality Safety: Last week, the NNSA Field Office returned comments to Triad management regarding their proposed alternative approach to addressing water ingress into gloveboxes that could potentially result in criticality. The proposed approach relies on arguments that criticality is not credible from non-fire-related water ingress into gloveboxes, nor water ingress associated with fires either outside or inside of gloveboxes.

Area G: N3B and mobile loading team personnel loaded another shipment for transport to the Waste Isolation Pilot Plant. However, the load exceeded the gross transportation limit of 80,000 pounds and could not be shipped. The loaded shipment remains in Area G. The mobile loading team plans to swap the tractor with a slightly lighter unit and complete the shipment next week.

N3B completed a management self-assessment for resumption of limited waste remediation activities in a tent inside Building 412. The allowable activities will include de-nesting drums from standard waste boxes, liner pulls, and replacing plastic liner bags. Contractor and federal readiness reviews are planned for later this summer.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 24, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 24, 2019

Flanged Tritium Waste Containers (FTWC): On Tuesday, the NNSA and EM Field Office Managers issued a joint letter to Triad and N3B providing direction to remediate the FTWCs stored at Area G (see 4/5/2019 report). The letter directs the contractors to develop a joint plan to vent the FTWCs at Area G and then move the vented containers to the Weapons Engineering Tritium Facility to complete the remediation. Triad will be responsible for developing the safety basis to support this activity and performing the work at Area G. The EM Field Office Manager will be the safety basis and startup approval authority with the NNSA Field Office Manager's concurrence.

Plutonium Facility–Transuranic Waste Management: Last week, during routine inspections, Triad personnel discovered a transuranic waste drum with a corroded filter vent in the basement of the Plutonium Facility. Aside from the vent, the drum appears to be in good condition and no contamination or other anomalies were detected. Waste operations personnel believe that there is no indication that the drum and its filter vent are not able to perform their safety functions. Safety basis personnel entered the New Information process and additional data is being collected regarding this drum and others. The drum was packaged last year and contains primarily leaded glovebox gloves from heat source plutonium operations. No other drums that have been inspected including some with the exact same waste profile show any evidence of vent corrosion. The deposits around the filter are acidic and additional chemical analysis is in progress.

Plutonium Facility–Safety Basis: The NNSA Field Office approved the Evaluation of the Safety of the Situation and Justification for Continued Operations for freight elevator failures with no conditions of approval or directed actions (see 3/8/2019 report). The higher drop heights for material in the elevator do result in slightly higher accident consequences to the public, however they remain well below the evaluation guideline, and no additional controls were recommended. The operational restriction put in place at the time a Potential Inadequacy in the Safety Analysis was declared will remain in place until the Documented Safety Analysis is revised to incorporate the more accurate consequences from this scenario.

On Thursday, Triad safety basis personnel recommended declaration of a Potential Inadequacy in the Safety Analysis associated with the hazards analysis for vehicle accidents impacting transuranic waste stored on pads outside the Plutonium Facility (see 4/12/2019 report).

RANT Shipping Facility: Triad transmitted to the NNSA Field Office a revised safety basis to address the first condition of approval to elevate acetylene and electric forklift controls to specific administrative controls from NNSA's original approval (see 11/2/2018 report). NNSA approved changes addressing the condition of approval related to WIPP certification in December 2018.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 31, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 31, 2019

Flanged Tritium Waste Containers (FTWC): Last Friday, Triad provided the DOE Field Offices with a schedule for remediation of the FTWCs with potentially flammable headspaces currently stored at Area G (see 5/24/2019 report). The proposed schedule has venting at the end of June at Area G then transportation to the Weapons Engineering Tritium Facility in early August. The DOE Field Offices are evaluating this proposal. Safety basis documents for both venting at Area G and transportation of the vented FTWCs to the Weapons Engineering Tritium Facility are under development. The venting process for the Area G FTWCs will be similar to that currently in use to remediate FTWCs at WETF although the Area G FTWCs are expected to be more challenging.

Plutonium Facility–Nuclear Criticality Safety: Last Thursday, Triad personnel submitted to NA-LA a revised safety basis addendum addressing changes to nuclear criticality safety related to water ingress into gloveboxes. This revision addresses comments from DOE’s review of the initial submittal which was transmitted in January. The addendum provides an alternative approach to address moderator ingress into gloveboxes. Under the current safety basis, a fissile material operation requires additional controls for moderator ingress unless there is an implemented process-specific evaluation showing these controls are not needed or the location is de-inventoried. Under the new addendum, operations will not need additional moderator controls if they meet criteria established in two Criticality Safety Technical Documents issued in January 2019 that provide general analyses for moderator ingress due to seismic events with and without fires.

Transuranic Waste Facility (TWF): Facility personnel partially implemented the revised safety basis that allows TWF to accept pipe overpack containers (POCs) and upgrades the fire suppression system to safety significant (see 5/17/2019 report). The upgrade to the fire suppression system and its associated limiting condition for operation were not implemented. To address the growing number of POCs in waste storage areas at TA-55, NA-LA and Triad personnel agreed to partially implement the safety basis amendment allowing POCs to be moved to the modern TWF facility. The fire suppression system is still undergoing troubleshooting. This week, TWF personnel were not able to restore flow to match the acceptance test curve as required by the new safety basis. However, the pumps are still capable of providing adequate flow and pressure to meet the sprinkler demand.

Transuranic Waste Management: Triad Safety Basis personnel entered the New Information process for both TWF and TA-55 to evaluate whether direction from the Carlsbad Field Office to the Waste Isolation Pilot Plant and the Idaho National Laboratory transuranic waste program regarding nitric acid and polyol interactions in waste have any impacts on the transuranic waste program at LANL.

Area G: N3B personnel completed another mobile loading shipment of transuranic waste to the Waste Isolation Pilot Plant.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 7, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 7, 2019

DNFSB Staff Activity: Staff members Z. Beauvais, C. Berg, M. McCoy, and P. Migliorini were at the laboratory to review weapons response basis information in support of safe operations at the Pantex Plant.

Plutonium Facility–Quality Assurance: During commercial grade dedication of new conduit and drive train supports associated with installation of new process equipment, workers discovered that the installed supports were not the type identified in the approved design. The components procured for this project were still in a controlled storage warehouse. They will be replaced with the correct components at the appropriate procurement level. Proposed corrective actions include ensuring that existing construction practices are adhered to, evaluating said processes for improvements, and evaluating the need to clean out the facility basement where construction materials are usually staged once obtained from controlled storage locations. Longer term corrective actions under evaluation include adding a controlled storage location in the facility.

Plutonium Facility–Operations: On Wednesday, facility workers noted a fog or haze in an adjacent glovebox following completion of a metal chlorination activity. No activities with the potential to form vapors were occurring in that box. The haze traveled through connecting boxes, and there were solid deposits on the floors and windows of some of the boxes. The workers immediately paused operations and made the appropriate notifications. With the chlorine system secured and purged, the haze dissipated. The nature of this event is under investigation although unintended chlorine entry into the boxes through mass flow controllers is a likely cause. Chlorine is piped to two boxes and ball valves in the line are left normally open during operations leaving the mass flow controllers functioning as isolation points. The mass flow controllers will be tested for leakage and the operating procedure will be evaluated for inclusion of a valve lineup.

Senior Management briefed the facility workforce on last year's Pu-238 uptake from a puncture wound (see 9/7/2018 report). The briefing included a discussion of that event as well as earlier puncture wounds at Los Alamos in 2008 and the Savannah River Site in 2010. The training emphasized the importance of conduct of operations and the integrated safety management process. Other key points included the need for strong organizational learning in order to avoid repetitive, ineffective corrective actions and recurring events.

Plutonium Facility–Infrastructure: On Wednesday, the NNSA Field Office unconditionally approved a revised Safety Design Strategy for the Fire Alarm System replacement project (see 6/29/2018 report). The revised strategy addresses the comments from NNSA on last year's revision. Key changes include: a more detailed discussion of the interface between the new alarm system and existing credited safety equipment, explanation of the prioritization of criticality alarms versus fire alarms, and a commitment to develop a demolition plan as part of preliminary and final design to ensure all such activities are bounded by existing hazards analyses.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 14, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 14, 2019

Confinement Vessel Disposition Project: Triad personnel recently completed repairs to the dry chemical fire suppression system at the workstation and started processing the ninth vessel, which is the last known to contain nuclear material. After removing the port cover, workers noticed a slit in the plastic they had wrapped it in. While taping up this slit, a continuous air monitor alarmed. The work crew placed the area in a safe configuration and exited the enclosure. There was no spread of contamination to the workers or outside of the enclosure.

Legacy Materials: Last Thursday, the NNSA Field Office approved a variance to the Triad's criticality safety program that allows use of a sum of ratios method to determine that a criticality is incredible for TA-59 Building 1. The criticality safety program currently applies the Pu-239 threshold significant quantity to mixtures of fissile isotopes. Triad made the request to support processing of legacy low-enriched uranium solutions from the Solution High-Energy Burst Assembly (SHEBA) into a more stable solid uranium oxide. The SHEBA solutions have been stored at the Chemistry and Metallurgy Research Building (CMR) since they were deinventoried in the mid-2000's from the TA-18 criticality experiments facility. Triad personnel plan to process them at TA-59-1 where small Pu-239 sources may also be stored. Solidification of the SHEBA solutions will eliminate a large volume of fissile solution currently stored in plastic bottles representing a substantial improvement to the criticality safety posture of CMR.

On Wednesday, CMR personnel discovered that shielded casks made from depleted uranium constituted a violation of the Technical Safety Requirements as the depleted uranium was of sufficient mass to require double containment. Given the low dispersibility and relative hazard of monolithic depleted uranium metal, safety basis personnel are evaluating whether to develop an exception to the double containment control for these casks. The casks have not been used for decades and are believed to be empty based on process and worker knowledge.

Radiological Laboratory Utility Office Building (RLUOB): On Saturday, while a work crew was performing planned breaker maintenance, the facility fire alarms sounded. Contrary to procedure, the work crew did not evacuate immediately, but briefly investigated the situation. The fire department responded and found no evidence of a fire. However, they found that one of the deluge systems that protect the ventilation system had actuated and flooded the associated filter plenum. A fire water pump ran for several hours; subsequent testing of the pump found no damage. The cause of this actuation is still under investigation. There was no spread of contamination during the event.

Facility personnel have confirmed that the corroded valves in the radioactive liquid waste system are carbon steel rather than the required stainless steel (see 5/3/2019 report). They are continuing to assess where the breakdown occurred that allowed the wrong type of valve to be installed.

Transuranic Waste Management: Triad Safety Basis personnel entered the New Information process for the Transuranic Waste Facility, CMR, and TA-55 to evaluate a Safety Alert issued by the DOE Office of Environmental Management related to the drum over-pressurization event at Idaho National Laboratory. The Safety Alert covers concerns related to pyrophoric materials, metal carbides, reactive materials, and requests information on the presence of flammable or near-flammable headspace gas concentrations in waste containers.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 21, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 21, 2019

Plutonium Facility–Transuranic Waste Management: On Monday, Triad personnel discovered five drums on an outdoor waste storage pad that were not present in the nuclear material control and accountability system. Facility operators entered the limiting condition for operation pertaining to exceedance of material-at-risk (MAR) in this location. Operators verified the contents of the drums, determined that the MAR limits had not been exceeded, and exited the condition on Tuesday. These drums were intended to be part of last year’s mobile loading shipment to the Waste Isolation Pilot Plant. However, only 16 of the planned 21 drums were shipped as weather delays extended operations to the point where one of the shipping casks’ certification expired. Facility management paused material movements from this storage pad while corrective actions are completed.

Plutonium Facility–Quality Assurance: During a final drawing verification walk-down, engineering personnel noted that several installed components for a new machining glovebox did not match the design drawings. Further checks found that almost half of the valves and gauges were incorrect. Some of these components are supposed to be safety-significant. The installed components were equivalent; however, the field change process had not been followed to allow for substitution. As a result of this discovery and another recent installation error (see 6/7/2019 report), facility management commenced an extent of condition review of construction projects.

Flanged Tritium Waste Containers (FTWC): Last week, Triad determined that they will recommend performing both a contractor and a federal readiness assessment for the venting of FTWCs in Area G. Triad will perform the contractor review, while NNSA will perform the federal review with the EM Field Office Manager as the startup authorization authority. Three safety basis documents for the process are in development by Triad: an addendum to the Area G Basis for Interim Operations to support venting, a Transportation Safety Document covering moving the FTWCs to the Weapons Engineering Tritium Facility (WETF), and an addendum for the WETF Documented Safety Analysis that will allow for handling of these FTWCs at WETF—the previous FTWC venting amendment for WETF is specific to three units currently being remediated at WETF. EM is the safety basis approval authority for the Area G addendum and NNSA is the authority for the other two documents.

Plutonium Facility–Configuration Management: Two weeks ago, engineering personnel updating drawings discovered that there was a positive pressure chilled water system entering a glovebox that has a criticality safety posting stating no liquid lines were plumbed into the box. The system had not been used in many years and was locked out upon discovery pending its removal as part of new equipment installations. A subsequent detailed walkdown this Friday determined the lines did not enter the box but terminated at a seal-welded plate heat exchanger.

Area G: Following less than 24 hours in their Initial Confirmatory process, N3B declared a potential inadequacy of the safety analysis related to MAR limits in Building 412. The safety basis has an inconsistency between hazard categorization and MAR limits for this facility. Management has prohibited introduction of MAR to the facility while they further investigate this issue.

Emergency Management: Last week, Triad replaced the damaged pane in the glass partition wall in the Emergency Operations Center (see 3/22/2019 report). The cause of the failure remains unknown; an engineering inspection concluded that snow load was not the failure mechanism.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 28, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 28, 2019

Plutonium Facility–Criticality Safety and Conduct of Operations: On Tuesday, workers attempting to reduce the backlog of production residues in a processing room (see 1/25/2019 report) moved six of the approximately 170 containers from floor storage to a material management area for disposition. Due to congestion in that area, they placed special nuclear material containers on the floor instead of inside a hood as planned. The work team then questioned whether this was allowable and concluded it was not. Nuclear criticality safety personnel determined that the situation was safe and stable and recommended categorizing the infraction as a level-1 non-compliance, since no analysis exists and no credited controls are in place for storage of fissionable material in this location.

Nuclear Material Management: While the oldest container of the production residues discussed above was generated in January 2017, the majority of the 170 containers were generated in the past year as part of meeting a programmatic milestone to complete a certain number of electrorefining metal production runs. This accumulation of residues is inconsistent with DNFSB/TECH-39, which highlighted that the disposal of residues ought to be an integral part of the production process. We note that Triad management does not currently keep metrics regarding production residue accumulation/disposition and that NNSA does not explicitly factor residue disposition as part of its production milestone criteria.

RANT Shipping Facility: While performing prerequisites for accepting potential payload builds for shipment to the Waste Isolation Pilot Plant, a worker noted that the Waste Compliance and Tracking System (WCATS) showed the proposed payload exceeded the material-at-risk limits. Further investigation discovered that the WCATS software did not credit a damage ratio for pipe overpack containers. Triad's safety software testing of WCATS to support RANT safety basis compliance had not found this discrepancy. Triad personnel have updated the code. During contract transition, Triad identified the need to review WCATS to improve compliance and efficiency.

Transuranic Waste Facility (TWF): On Monday, Triad personnel determined that an unreviewed safety question (USQ) existed associated with the safety-class seismic power cutoff system (SPCS) due to potential interference with the laboratory's new counter unmanned aerial vehicle system (CUAS). During testing of the CUAS, TWF personnel had a compensatory measure to perform an existing surveillance requirement on the SPCS following any actuation of the CUAS. TWF personnel were not notified that the CUAS went live and therefore were unable to perform the surveillance requirement to assure functionality of the SPCS.

Transuranic Waste Management–Safety Basis: Facility management at TWF and TA-55 declared potential inadequacies of the safety analysis (PISA) concerning recent information on nitric acid interactions with polyols (e.g., cheesecloth) in waste (see 5/31/2019 report). The PISAs note that the potential for autocatalytic reaction is not currently evaluated in the safety bases; however, it also states that there is currently no cheesecloth waste at the facilities that have been contacted with greater than 12 M nitric acid. We note that 15.8 M nitric acid is used in the Plutonium Facility and that an important aspect of resolving these PISAs will be addressing the potential for an increased respirable release fraction from energetic reactions involving oxidizer-bearing organics. Separately, safety basis personnel determined the PISAs concerning vehicle impacts and fires at both outdoor waste pads at TA-55 represent positive USQs (see 5/24/2019 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 5, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plae and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 5, 2019

Plutonium Facility–Conduct of Operations: Last Thursday, workers in a material management room discovered an unexpected powdery residue underneath a brush in a glovebox that is supposed to be swept clean following activities. They paused work and reported their discovery. The material did contain plutonium. Pit Technologies Division management initiated a safety pause for work in this area due to concerns with this discovery and the recent criticality safety infraction (see 6/28/2019 report). They briefed the workforce and resumed activities using deliberate operations.

Area G–Safety Basis: The plan and schedule for achieving an improved, modern safety basis remains uncertain. When standing up the EM Field Office in 2015, DOE-EM leadership recognized that the Basis for Interim Operations (BIO) that served as the safety basis since 2012 was no longer appropriate given that nuclear operations were reasonably expected to extend well past the nominal 5-year lifetime envisioned by DOE-STD-3011. As such, in May 2016 the EM Field Office contracted with a vendor to write a new Documented Safety Analysis developed in accordance with DOE-STD-3009-2014. The EM Field Office received that safety basis (see 3/23/2018 report) and after review and revisions ultimately transmitted it unapproved to N3B for further alignment with their current approach (see 3/22/2019 report). In April 2019, N3B responded to the EM Field Office proposing an alternate approach that instead involved improving the existing BIO in order to realize mission benefits. Notably, N3B proposed continuing to follow DOE-STD-3011-2002 for the improvements, representing a departure from the previous desires of DOE-EM leadership to move forward to a DOE-STD-3009-2014 derived safety basis. The EM Field Office subsequently established a draft review schedule and began developing a review plan to capture the overall safety basis strategy. EM-LA has not yet formally responded to the N3B approach.

Last Thursday, N3B personnel determined the recent potential inadequacy of the safety analysis related to material at risk limits in Building 412 constituted a positive unreviewed safety question (see 6/21/2019 report). Restrictions on introduction of material to the facility will remain in place until the BIO is updated.

Nuclear Criticality Safety and Safety Basis: Last week, a nuclear criticality safety analyst updating a criticality safety evaluation document (CSED) for building TA-35-02 discovered that the facility could exceed the upper safety limit for criticality if the bounding material configuration were analyzed with a more representative methodology. The analyst noted similar concerns for TA-35-27 and TA-66-1. The Nuclear Engineering and Nonproliferation Division primarily uses these facilities, which are all less than hazard category 3 (HC-3). While their inventories exceed HC-3 threshold quantities, a sufficient portion of the material is in the form of sealed sources, of which some do not contribute against material-at-risk inventory limits because they are certified. The CSEDs had originally concluded that criticality accidents were not credible due to the nature of the process. If criticality accidents were credible, the facilities would need to be hazard category 2 per DOE-STD-1027. Management paused fissile operations in these facilities and criticality safety analysts determined that all three facilities are in a safe condition. Criticality safety personnel determined that the current material limits for TA-66-1 were acceptable, although a non-implemented material limit increase was not acceptable. They plan to revise the current CSED for TA-66-1 to include the more representative methodology to demonstrate that the current TA-66-1 limits are acceptable. Triad and NNSA personnel are evaluating the impacts of the new model on criticality safety for TA-35-27 and TA-35-2. The current actual inventories in these facilities are safe. Fissile material movement restrictions will remain in place until the CSEDs for these facilities are revised.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 12, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 12, 2019

Transuranic Waste Management–Conduct of Operations: Last Tuesday, Plutonium Facility workers were unable to locate a waste drum. After further investigation, they determined that the nuclear material control and accountability system had not been updated when 39 waste drums were moved the previous week. Waste operations personnel commenced a full inventory of drums in relevant locations and found a new concern—tamper indicating devices (TID) were not installed correctly on some drums. After a multi-facility review, they found 35 drums at the Plutonium Facility and seven at the Transuranic Waste Facility (TWF) with incorrectly installed TIDs. Most of the drums with incorrect TIDs originated from 2018 Confinement Vessel Disposition project activities at the Chemistry and Metallurgy Research Building. Workers replaced all of the incorrectly installed TIDs without opening drums and re-inspecting the contents after consulting with the Central Characterization Project. To prevent recurrence, Triad personnel are evaluating the procedure for moving waste drums, as well as the training that took place two years ago when the process for installing TIDs changed.

Transuranic Waste Management–Safety Basis: Triad personnel determined that the potential inadequacy of the safety analysis related to nitric acid interactions with cheesecloth (e.g., polyols) constitutes a positive unreviewed safety question for the Plutonium Facility (see 6/28/2019 report). The current safety basis only evaluates drum deflagrations which behave differently than the rapid over-pressurization event that could be caused by incompatible materials. Facility personnel noted that while high concentration nitric acid and polyols exist in the facility, there are no drums in the current waste inventory that contain polyols that have been contacted with such nitric acid.

Area G: While reviewing existing criticality safety evaluations for storage of high fissile gram equivalent (FGE) waste containers, N3B personnel noted that there is an insufficient technical basis for the existing criticality control set for these containers. Criticality safety personnel have determined that the eight high FGE containers currently present are safe. Management has isolated the area and prohibited receipt of container with greater than 300 FGE.

On Monday, a team commenced the contractor readiness assessment for resumption of drum liner pulls and solid waste box de-nesting operations in Building 412 (see 5/17/2019 report).

Flanged Tritium Waste Containers (FTWC): Triad is continuing to develop safety basis documentation for venting, transportation, and receipt of the FTWCs currently stored at Area G (see 6/21/2019 report). They are evaluating means to prevent the release of tritium even if the consequences would not trip the threshold for credited safety controls. Remediating the four FTWCs at Area G and the two unvented FTWCs of concern at the Weapons Engineering Tritium Facility (WETF) is challenged by the lack of useable space at WETF. Tritium-containing waste may need to be shipped offsite prior to continued venting of the FTWCs at WETF and receipt of vented FTWCs from Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 19, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 19, 2019

DNFSB Staff Activity: D. Gutowski was at DNFSB Headquarters in support of agency planning initiatives for fiscal year 2020.

Plutonium Facility–Nuclear Materials Management: Last Friday, operators found that the box furnace they were using to oxidize legacy nuclear material had experienced an unexpected thermal excursion from about 380 to 640 °C. This rapid temperature increase caused the furnace to automatically shut off. The exothermic reaction also spread fine black powdered residue within the glovebox and an adjacent glovebox. There was no release of material outside of the glovebox system and the glovebox does not appear to have been damaged. The legacy items originated from research activities in the 1980's and were being processed as part of the Materials Recovery & Recycle program. The oxidation process is intended to produce a stable material form for disposition, typically as transuranic waste. Facility personnel intend to develop a recovery plan to clean and inspect the gloveboxes and furnace, replace the filter, obtain and analyze samples of the materials to ascertain the chemistry, and review the inventory to identify any similar materials. Safety basis personnel also entered the New Information process to examine implications for the safety basis.

Plutonium Facility–Safety Basis: On Wednesday, Triad management transmitted to the NNSA Field Office their evaluation of the safety of the situation (ESS) regarding vehicle impacts with transuranic waste containers stored on the outdoor pads (see 6/28/2019 report). The ESS examined two cases of impact with subsequent fuel pool fire: (1) a security vehicle with a high energy impact and small fuel pool volume and (2) a refueling truck with a low energy impact and large fuel pool volume. The ESS determined that the consequences do not warrant safety class or safety significant controls, but noted the vehicle barriers provide an important preventive, engineered safety function and recommended them to remain as Other Hazard Controls. The NNSA Field Office is reviewing the ESS.

Last week, Triad management transmitted to the NNSA Field Office a safety basis strategy and an updated project execution plan in support of the effort to upgrade the safety basis to comply with DOE-STD-3009-2014 (see 12/31/2018 report). The update includes clarifications to expectations for quality assurance and team interactions. The expected final submittal date remains March 31, 2022.

Transuranic Waste Management: This week, Triad personnel resumed loading operations at the RANT Shipping Facility after completing an outage to repair the roof. They completed one shipment and are working toward establishing a desired steady-state rate of about five shipments a month. However, their ability to ship is currently paced by waste container certification activities controlled by the Carlsbad Field Office. In another positive development, last week Triad personnel moved the first batch of pipe overpack containers (POC) with the new fusible filters to the Transuranic Waste Facility. These new filters support a damage ratio of zero for postulated fire scenarios (see 1/25/2019 report). Triad is also planning the first shipment of POCs to the Waste Isolation Pilot Plant in the coming weeks. This is important because POCs represent a substantial fraction of the current waste container population.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 26, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 26, 2019

Transuranic Waste Management–Safety Basis: Last week, the Carlsbad Field Office issued LANL a non-conformance report concluding that 9 transuranic waste containers did not meet the waste acceptance criteria for the Waste Isolation Pilot Plant. All of the non-conforming containers are currently stored at Area G, though two are owned by Triad. These containers specifically failed to meet the Basis of Knowledge requirements for oxidizing chemicals that DOE established to preclude another energetic chemical reaction and radioactive material release at WIPP. These energetic reactions can result in greater airborne respirable releases of radioactive material than is typically analyzed. Triad recognized this fact with their recent declarations of potential inadequacies of the safety analysis (PISA) for their facilities (see 6/28/2019 report) due to interactions between polyols and nitric acid—just one consideration in the BoK. When N3B reviewed the polyol information, they did not declare a PISA because they believe these reactions are adequately covered by existing accidents that are modeled as flammable gas deflagrations. In contrast, the approved safety basis for the Transuranic Waste Facility acknowledges that releases from these energetic events could be 2–3 orders of magnitude greater than is analyzed for deflagrations (see 4/5/2019 report). Controls for an energetic event may also be different than for a flammable gas event. N3B is reviewing the situation.

Plutonium Facility–Nuclear Materials Management: On Wednesday, facility personnel held a fact-finding for an issue that occurred on July 9, 2019, when safeguards personnel discovered liquid on the floor of a glovebox used to stage several plastic carboys containing plutonium-238 aqueous processing residues. Further investigation identified that a carboy had cracked and released some of its contents, an exposed electrical wire was in the liquid, and a cable assembly on a spool piece door had failed. Since then, personnel isolated the conductor, properly cleaned the spill, and replaced the door cable. Notably, the replacement of this cable and the cable involved in last year's puncture wound were the first to be replaced since that August 2018 accident (see 2/8/2019 report). This incident had several similarities to last year's unexpected drop in solution level (see 6/8/2018 report). While previous corrective actions to improve spill response were successful, planned actions to minimize the backlog of these production residues, improve tracking of carboy volumes and age, and eliminate reliance on plastic carboys have not yet been achieved.

TA-48 Radiochemistry Facility–Radiological Control: Last Wednesday, the questioning attitude of several workers prevented the possibility of contaminated material being transported offsite. They were cleaning radiologically uncontrolled laboratory space in the Radiochemistry Facility, noted water staining, and decided to take precautionary radiological smears. They discovered contamination, paused, and called a radiological protection technician to confirm the presence of contamination. The following morning, the technician began controlling and surveying items already removed from the room, as well as performing extensive surveys of personnel, the facility, and equipment. No personnel contamination was detected; however, the surveys did discover contaminated items in a recycling bin. The source of contamination was a leak in a radioactive liquid waste line from the radiological laboratory on the floor above.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 2, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 2, 2019

Plutonium Facility–Nuclear Materials Stabilization: Plutonium Facility personnel recently completed their historical analysis and received approval for their recovery plan for the furnace involved in the recent thermal excursion (see 7/19/2019 report). The recovery plan specifies that personnel will take samples of the black residue for analysis, inspect the furnace crucible and glovebox filter, replace all of the gloves, and test the operability of the furnace. The historical analysis notes that an exothermic reaction is likely responsible for the unexpected 220 °C excursion that initiated at about 378 °C. The analysis notes that some of the legacy items present in the batch contained bismuth and zinc, and that it is likely that exothermic reactions between these metals and oxygen caused the excursion. Additional research is ongoing to identify similar items to be flagged for special processing. Safety basis personnel entered the new information process to evaluate this event and concluded that there was no potential inadequacy of the safety analysis as the event was bounded by existing analyses.

Plutonium Facility–Transuranic Waste Management: Waste Operations personnel are continuing to develop work control documents to allow flammable gas sampling and intrusive investigation of the drum with a corroded filter vent discovered in May (see 5/24/2019 report). The contents of this drum included gloves made of a chlorinated polymer. Historically, the Rocky Flats Plant experienced significant internal corrosion of drums where radiolysis of carbon tetrachloride resulted in internal container corrosion and filter plugging in some cases. At Rocky Flats, operators developed an apparatus to confirm flow through potentially corroded filters rather than relying on visual and auditory observation to determine operability.

Area G–Work Control: On Wednesday, a subcontractor performed work to remove the Lightning Protection System for Dome 229 that had not been released on the Plan of the Day. This work was intended to start on Dome 230 once the work package was approved and released. N3B personnel paused the work when they discovered it was occurring and held a Fact Finding Meeting to evaluate the breakdowns in the work control process including lack of a formal pre-job briefing, incomplete training for the subcontractor person in charge, work scheduling and release, and responsibility for subcontracted work. N3B Management is planning to perform an apparent cause analysis of this event. The Lightning Protection System does not have a credited safety function in the Area G safety basis and N3B engineering personnel and the subcontractor believe the Dome 229 system still provides adequate cones of coverage. As a precaution, facility personnel are implementing a fire watch while the system is evaluated and repaired. The system is being removed to support reskinning of the domes which were damaged by heavy snowfall (see 1/11/2019 report).

Chemistry and Metallurgy Research Building: Facility management approved a second extension for completion of a root cause analysis for the March level 1 non-compliance criticality safety infraction (see 3/15/2019 report). The analysis is now expected to be complete at the end of August.

Weapons Engineering Tritium Facility–Readiness: An eleven member contractor team completed their readiness assessment for resumption of pinch welder operations at the Weapons Engineering Tritium Facility. The team had one prestart finding related to the level of detail in the startup plan and one post-start finding related to analysis of hot work conditions. A Federal Readiness Assessment will follow.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 9, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 9, 2019

Transuranic Waste Management–Safety Basis: On Tuesday, the LANL Central Characterization Program (CCP) issued Triad and N3B new non-conformance reports related to transuranic waste containers that failed to meet the Basis of Knowledge (BoK) requirements associated with the waste acceptance criteria for the Waste Isolation Pilot Plant (see 7/26/2019 report). This means that WIPP will refuse to receive the containers because their contents may be susceptible to exothermic chemical reactions and propagating fires. Triad and N3B will need to either provide additional information to substantiate compliance with the BoK or perform treatment to eliminate the hazard. These reports bring the number of containers that are currently non-compliant with the BoK to 24 stored within the fabric domes at Area G and 4 stored on the outdoor waste pads at the Plutonium Facility. The non-conformances challenge various aspects of the BoK. For example, CCP rejected the containers on the outdoor pads because the information Triad provided indicated that an unknown liquid was absorbed by an engineered organic polymer sorbent in an unknown ratio and therefore compliance with the BoK could not be demonstrated. Triad waste management personnel have since submitted to CCP further information regarding the nature of the liquids that they gathered during interviews with two workers involved in generating these waste containers in 2015. CCP is evaluating this information.

TA-21 Environmental Remediation: During potholing activities to locate utility lines in TA-21, N3B and subcontractor personnel encountered soil contamination adjacent to an industrial waste line. Radiological control technicians (RCT) who were present with the work team paused the activity and found contamination on the line, excavated soil, and the workers tools. There was no worker contamination and the work area is currently in a safe configuration. Discovering contamination is anticipated during this type of activity, and continuous RCT coverage is a corrective action from a January 2019 potholing job in the same area when workers uncovered an industrial waste line and backfilled it before RCTs could survey it. N3B management is evaluating the clarity of the command media for potholing tasks to ensure that all relevant requirements are included without ambiguity.

TA-35 Nuclear Criticality Safety: On Tuesday, Triad management lifted the pause on fissile material operations at TA-35-002 and TA-35-027 following re-evaluation of the criticality safety evaluations (see 7/5/2019 report). The re-evaluation concluded that the original control set is conservative.

Plutonium Facility–Radiological Safety: On Tuesday, a hand and foot monitor at the exit of the Plutonium Facility detected contamination on a workers hand. The worker had been performing assembly operations and had cleared a full body survey and a hand and foot monitor at the room exit. RCTs responded and successfully decontaminated the individual. Follow-up surveys found no contamination spread in the work area and none of the other approximately 40 workers in the same room had any contamination detected. In response to this discovery, facility management plans to reinforce training and expectations for doffing of protective equipment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 16, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 16, 2019

Infrastructure: NNSA's Office of Safety, Infrastructure, and Operations held a Master Asset Plan Deep Dive. The deep dive covered out-year planning for infrastructure needs across the laboratory.

Transuranic Waste Management–Safety Basis: Last Thursday, Triad transmitted to the NNSA Field Office their evaluation of the safety of the situation (ESS) on the nitric acid and polyol interaction issue (see 7/12/2019 report). This type of chemical reaction interaction between organic and oxidizer is one of the types of energetic chemical reactions that the safety basis for the Waste Isolation Pilot Plant (WIPP) precludes through the implementation of the Basis of Knowledge (see 8/9/2019 report). The ESS concludes that no controls other than the existing safety management program are needed. It notes that the facility will continue to use visual inspections and the current waste management processes to prevent the combination of cheesecloth (a polyol) and greater than 12 M nitric acid. The ESS further notes that an energetic chemical reaction can be conservatively modeled as a single waste container over-pressurization and shows that the unmitigated consequences do not challenge thresholds for requiring additional controls. Notably, at the Board's June 20, 2019, public hearing on solid nuclear wastes, DOE Headquarters personnel stated that the Department learned from the February 2014 radiological release at WIPP that it might be appropriate to use an effective respirable release fraction for energetic chemical reactions that is about a hundred times higher than the value used by Triad; however, DOE has not promulgated direction on the applicability and use of this release fraction beyond the WIPP contractor (see 11/20/2015 report). Use of a release fraction a factor of ten higher for this scenario would exceed the threshold for crediting safety controls.

Area G: Last week, Triad informed N3B about the presence in Area G of waste containers with contents similar to the container they discovered in the Plutonium Facility basement with a corroding vent (5/24/2019 and 8/2/2018 reports). These containers also have many glovebox gloves made from a chlorinated polymer that were previously used for plutonium-238 applications. N3B personnel checked the two containers and found that one appeared visually acceptable and the other had been overpacked in March 2019 after corrosion was detected during routine inspections.

Flanged Tritium Waste Containers (FTWC): The integrated project team continues to develop the procedures, personnel, and equipment necessary to vent the FTWCs with the potential for flammable headspaces that are stored at Area G (see 7/12/2019 report). In a letter dated June 28, 2019, Triad projected commencing the venting operation in October 2019 with completion of the remediation activities by January 2020. The latest schedule anticipates these activities in January 2020 and May 2020, respectively.

Two other FTWCs stored in the Weapons Engineering Tritium Facility with the potentially flammable headspace remain in an unvented state due to a shift in priority to repackage the contents of other FTWCs containing contaminated parts for offsite disposal. However, recent developments at the Nevada National Security Site have introduced uncertainty to the planned disposal option.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 23, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 23, 2019

DNFSB Activity: DNFSB Chairman Hamilton visited the laboratory on Tuesday and Wednesday. He met with leadership from both field offices and contractors, received briefings on planned nuclear material inputs and outputs from the Plutonium Facility, the exit strategy for the Chemistry and Metallurgy Research (CMR) building, and the project to disposition the Flanged Tritium Waste Containers. He also walked down the Radiological Laboratory Utility Office Building, Plutonium Facility, Area G, and the Transuranic Waste Facility.

On Friday, one of the resident inspectors briefed the New Mexico Legislature's Radioactive and Hazardous Waste Committee on the status of DNFSB oversight at LANL and the impacts of DOE Order 140.1.

Plutonium Facility–Criticality Safety: Last week, waste management personnel successfully overpacked a transuranic waste container into a standard waste box. This container had been infractioned for an overmass condition and has been covered through a recovery plan that was approved in April 2016.

Safety Basis: On Wednesday, the NNSA Field Office unconditionally approved the evaluation of the safety of the situation (ESS) for depleted uranium shield issue at CMR (see 6/14/2019 report). On Tuesday, the NNSA Field Office unconditionally approved the ESS for the issue concerning the counter unmanned aircraft system issue at TWF (see 6/28/2019 report). Also on Tuesday, the NNSA Field Office approved a revision to the RANT Shipping Facility documented safety analysis closing a condition of approval related to acetylene and electric forklifts (see 11/2/2018 report). The safety basis revision elevated administrative controls related to acetylene and forklift use to new specific administrative controls. The approval included one new condition of approval requesting the analysis of hazards of acetylene cylinders be broadened to include internal cylinder explosions. As the control for acetylene prohibits its presence when waste containers are in the facility, a more thorough analysis is not expected to change any controls.

Area G–Readiness: Last month, a ten member contractor team completed a readiness assessment for resumption of limited operations in the sort, segregate, and size reduction (SSSR) enclosure in Building 412 as a prerequisite to a federal readiness assessment. The specific operations being assessed for resumption are denesting of drums from standard waste boxes and waste container liner repacking of compromised containers. These activities have not been performed in Building 412 since May 2014. The review team found four pre-start and four post-start findings. Of note, two of the pre-start findings addressed configuration management, specifically for the critical lift plan and the drawings and electrical configuration of the SSSR enclosure.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 30, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 30, 2019

Flanged Tritium Waste Containers (FTWC): On Wednesday, Triad submitted to the NNSA Field Office a safety basis addendum in support of venting and handling the FTWCs with potentially flammable headspace currently stored in Area G. The addendum proposes credited design features including the FTWC vessel, an overpressure barrier, and a restricted flow orifice. Additional proposed controls include Specific Administrative Controls (SAC) regarding the use of the vent rig and the pressure monitoring manifold. The NNSA Field Office is currently reviewing the addendum for ultimate approval by the EM Field Office.

Radiological Laboratory Utility Office Building: On Wednesday, Triad submitted to the NNSA Field Office the safety basis supporting future hazard category 3 nuclear operations. The safety basis is written to the new DOE-STD-1228-2019, *Preparation of Documented Safety Analysis for Hazard Category 3 DOE Nuclear Facilities*. Notably, DOE has not yet approved the proposed revision of 10 CFR 830, *Nuclear Safety Management*, which incorporates this new standard. The safety basis primarily relies on a SAC to protect the material-at-risk inventory in the facility at a level that ensures offsite and collocated worker consequences are well below the threshold for additional controls. Engineered defense-in-depth controls include: the building structure, fire suppression system, glovebox enclosures, fume hood ventilation, and building ventilation. Triad requested approval by December 2019 to support the pit production mission.

Safety Basis: On Wednesday, the NNSA Field Office approved a temporary safety basis modification to support the transportation of a 231 ton motor generator rotor offsite for repair. Triad submitted the modification on Monday to cover the fact that the rotor will pass several hazard category 2 and 3 nuclear facilities on its travel path, and the mass of this transport challenges assumptions in the vehicle crash analyses for these facilities. The safety basis modification states that the RANT Shipping Facility, Waste Characterization Reduction and Repackaging Facility (WCRRF), and the Transuranic Waste Facility (TWF) could be impacted by the transport based on topography. The required controls in the modification are: ensuring that WCRRF and RANT are in cold standby mode during the activity, ensuring that the vehicle travels below five miles per hour to ensure the kinetic vehicle barriers for TWF can protect the facility, a rolling road closure, and a vehicle inspection. The NNSA Field Office directed two changes to ensure the controls were appropriately worded for the return trip.

Emergency Management: Earlier this month, N3B completed their after-action report for the drill that was conducted during the Building 412 contractor readiness assessment (see 8/23/2019 report). Of relevance for the entire laboratory, the report notes that there are significant differences in the terminology used between radiological control technicians and Los Alamos County Fire Department (LAFD) personnel to convey readings. Fire department personnel specifically raised this concern during the player hot wash with the particular examples of confusion regarding surface contamination levels and airborne radioactivity. The report further notes that this is an ongoing, known problem across the laboratory. N3B procures emergency management support services from Triad, which works with the NNSA Field Office to contract services from LAFD.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 6, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 6, 2019

DNFSB Staff Activity: On Thursday, a staff team held a teleconference with EM Field Office and N3B personnel to discuss the safety basis implications of the recent non-conformances against the Basis of Knowledge (BoK) (see 7/26/2019 report). The team examined the safety implications of two of the 24 rejected containers. The Central Characterization Program rejected these containers because their conservative review of records indicated that one potentially contained organic cat litter and neutralized nitric acid and the other an engineered organic absorbent and nitric acid. In the BoK, DOE has prohibited certain ratios of these materials without a *de minimis* threshold mass given their potential to support chemical exothermic reactions or propagating fires. EM Field Office management maintain the existing safety basis adequately analyzes the hazards posed by these containers. N3B has placed hold tags on the containers until they have the capability to remediate them in a few years.

Management–Abnormal Event Notifications: The resident inspectors recently discussed with Plutonium Facility senior management their observations regarding an apparent trend of decreased formal notifications for abnormal events. Event notifications are part of Triad’s Contractor Assurance System and, in our opinion represent one important tool to ensure awareness across the institution, including to the NNSA Field Office. We found that, while the overall number of fact-findings has actually increased, the number of notifications has dropped by about half compared to the first 8 months of calendar year 2018. The data show that notifications were sent for only about 20 percent of the events that management had deemed appropriate to conduct a fact-finding. For example, review of the data indicate that formal notifications of potential process deviations, the term typically used for concerns associated with complying with nuclear criticality safety requirements, no longer consistently receive an event notification. Additionally, some significant recent events are not being notified such as the recurrent leaking carboys of Pu-238 process residue solutions (see 7/26/2019 report), the furnace thermal excursion (see 7/19/2019 report), and the corroding waste drum filter (see 5/24/2019 report). Plutonium Facility management is reviewing the situation, but believes their current approach to reporting improves focus on more meaningful events.

Plutonium Facility–Safety Systems: Waste management personnel have identified an additional five transuranic waste containers with varying degrees of rust-like buildup around their filters (see 8/2/2019 report). All of the containers include glovebox gloves made from chlorinated polymer that were used in plutonium-238 operations. Waste management personnel continue preparations to sample the headspace gas and intrusively investigate the containers.

Plutonium Facility–Infrastructure: Last week, workers discovered liquid in the basement of the Plutonium Facility. The responders discovered it was from an overflowing sump (see 11/30/2018 report). Further investigation determined that the overflow was likely due to blockages in the industrial waste line and troubleshooting was hindered by the lack of clear technical drawings. Facility personnel have cleaned up the liquid and decontaminated much of the area. Areas that were not accessible by the decontamination team remain posted as a contamination area. Planned corrective actions include improving drawings and evaluating periodic testing of the drainage system.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 13, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 13, 2019

Transuranic Waste Management–Safety Basis Inconsistencies: Last Friday, the NNSA Field Office conditionally approved Triad’s evaluation of the safety of the situation (ESS) concerning the interaction between polyols and nitric acid (see 8/16/2019 report). The field office noted that Triad did not provide a supporting basis for modeling the energetic reaction using a respirable release fraction of 2×10^{-3} , which corresponds to a pressurized release from a container that fails at 25 psig. They further noted that the DOE handbook release fraction for failure above this pressure threshold is an order of magnitude higher and would raise the dose estimate such that safety class controls would be required. As such, the NNSA Field Office requested that Triad provide within 30 days a basis for the bounding pressure of a drum failure. They also directed Triad to elevate the current visual examination practices to a Specific Administrative Control to prevent the comingling of polyols and nitric acid.

Similar potentially incompatible materials may exist within waste containers stored at Area G; however, the EM Field Office and N3B maintain their existing safety basis adequately covers this hazard. They assert that the hazard is appropriately modeled as a flammable gas deflagration using a release fraction of 5.4×10^{-4} consistent with DOE-STD-5506-2007. Notably, DOE has yet to update this standard to reflect lessons learned from energetic reactions in waste drums at the Waste Isolation Pilot Plant and Idaho National Laboratory.

Area G–Safety Basis: Several safety basis documents await action by the EM Field Office including: (1) a response to N3B’s April 2019 proposal to upgrade the Basis of Interim Operations (BIO) in lieu of using a Documented Safety Analysis (see 7/5/2019 report); (2) formal comments on the BIO annual update that N3B submitted in March 2019; and (3) approval of the ESS (see 6/21/2019 report) and Justification for Continued Operations (see 8/9/2019 report) regarding the Building 412 material-at-risk issue.

Conduct of Operations: Last month, Triad analysts completed the causal analyses for the March and June level one non-compliance nuclear criticality infractions at the Chemistry and Metallurgy Research (CMR) Building and the Plutonium Facility (see 3/15/2019 and 6/28/2019 reports). In both events, workers erroneously placed containers with nuclear material in unanalyzed floor locations. For the CMR event, the analysis determined that there were inadequacies in the assessment of changing work scope and training. For the Plutonium Facility, the analysis determined that there was a lack of first line management engagement during practice and during the first performance of the activity. Both reports provide a series of recommended actions to address the issues. For CMR, recommended actions include revising command media to address timely use of nuclear material control and accountability software, revising the fissile material operations review procedure to evaluate collocated operations, addressing training deficiencies, and promulgating lessons-learned. For the Plutonium Facility, recommended actions include formalizing expectations for persons-in-charge, evaluating the creation of a floor storage location, and addressing several training issues.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 20, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plau and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 20, 2019

Plutonium Facility–Transuranic Waste Management: Last Thursday, a waste management worker lost control of a 320 pound pipe overpack container (POC) as he was attempting to tip and roll it off of a metal pallet. The POC toppled to the ground missing the worker. Three workers then righted the POC and contacted the operations center. Radiological protection and container engineering personnel then determined the container was undamaged. The work crew recognized their failure to properly pause work and held an immediate post-job. At the fact-finding this week, workers discussed a control in the procedure that specifies the use of two people for the movement of heavy items “if item is beyond your level of comfort.” Several workers noted that their formal training indicated it was safer for an individual to perform such moves. Management noted the current saturation of waste containers contributed to the event and took an action to investigate narrow engineered drum handling equipment. This Thursday, a waste management worker lost control of a different POC while moving it with a drum handler—no injury occurred and the POC was undamaged. Management has paused all waste container movements pending a review of procedures and training.

Last week, waste management workers sampled the headspace of the containers with corroded filters and found them to be compliant with flammable gas requirements (see 9/6/2019 report). They continue efforts to procure and establish a capability to open the drums for intrusive investigation. Notably, neither Triad nor N3B currently possess the capability to open transuranic waste containers for remediation if prohibited contents are found or other issues emerge.

Plutonium Facility–Safety Basis: Triad safety basis personnel determined that unanalyzed heat source plutonium hold-up in dropboxes constituted a positive unreviewed safety question. The currently implemented safety basis states that holdup in locations other than analyzed gloveboxes is “insignificant.” Recent measurements of several dropboxes found holdup in the gram range. Safety basis personnel are evaluating the appropriate way to account for this material.

Triad personnel also concluded that the storage of non-destructive assay sealed calibration sources in non-fire rated storage locations also constituted a positive unreviewed safety question. The issue of storage within the facility grew out of a similar concern with sources on an outside waste storage pad (see 8/12/2016 report). The currently implemented safety basis contains fire scenarios beyond the temperature limits for the sources. The approved, but not yet implemented safety basis includes a new fire analysis that does not exceed temperature limits based on actual combustible loading in the area.

Area G–Radiological Protection: N3B recently adjusted their approach to facility radiological protection. They reviewed radiological survey data and found that since 2012 no contamination levels exceeded release criteria for vehicles, personnel, domes, and buildings. As a result, they removed the requirement to perform a radiological survey for personnel, and in most cases vehicles, prior to exiting Area G. Instead, personnel are required to survey only at the radiological buffer areas associated with the three Sort, Segregate, and Size Reduction enclosures. N3B has compensated for the reduced number of personnel surveys by increasing routine monitoring of domes from monthly to weekly. Triad personnel also continue to perform retrospective analyses for environmental compliance of the monitored stacks on a weekly basis and perimeter boundary stations on a quarterly basis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 27, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 27, 2019

DNFSB Staff Activity: D.J. Brown and M.W. Dunlevy observed a peer review workshop on the disposition options for the inappropriately remediated nitrate salt wastes currently stored at the Waste Control Specialists facility. Dunlevy also completed walk-downs focused on transuranic waste management at Area G, the Chemistry and Metallurgy Research Building, and the Plutonium Facility.

Management: Senior federal and contractor officials from other NNSA sites conducted a three day peer review of the governance system. The team received briefings, observed routine mission assurance interactions, and held round table discussions with personnel involved in mission assurance. Overall, they found that the vector is positive for all of the reviewed elements. They also identified a number of notable practices and feedback for consideration concerning Triad, the NNSA Field Office, and NNSA Headquarters.

Emergency Management: On Wednesday, Triad conducted their annual emergency exercise. This year's scenario involved a dropped payload of transuranic waste at the RANT Shipping Facility and a near concurrent wildland fire at TA-49. Conduct of the exercise was challenged by the need for assets to respond to several real-world emergencies including a spill of an unknown liquid, a truck fire, and the evacuation of the Emergency Operations Center due to high carbon dioxide levels. Triad and NNSA personnel believe they were able to adequately complete the objectives of the exercise despite these interruptions and are evaluating performance.

Plutonium Facility–Infrastructure: Last weekend, Plutonium Facility personnel successfully executed an outage of the fire suppression system to complete a number of maintenance activities. Notably, they completed the field work associated with eliminating the seismic interaction issues where insufficiently qualified ventilation handling equipment was located above sprinkler piping. This action resolves one of the issues identified in the Board's letter dated May 12, 2016. Work is ongoing to analyze additional upgrades that may be required to achieve seismic performance category 3 for the fire protection system.

Plutonium Facility–Work Control: On Monday, a craft worker inadvertently cut a line on the potentially pressurized side of a locked out valve. The system was fortunately unpressurized and there were no injuries. The worker who performed the cut did not have a personal lock in place. Facility management noted that while this specific event had no consequences, it bore similarities to other events and could easily have led to more significant problems. Facility construction management instituted a pause on lock out/tag out activities. Triad will perform a formal causal analysis and will evaluate corrective actions from previous events for effectiveness.

Plutonium Facility–Transuranic Waste Management: On Wednesday, management lifted the pause on transuranic waste drum handling activities following training of personnel on techniques and equipment for safe handling of drums.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 4, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 4, 2019

NNSA Field Office: On Monday, Mr. Steve Goodrum retired from federal service. Mr. Gabriel Pugh replaced him as manager in an acting capacity.

Emergency Management: Last Thursday, workers discovered two bulging plastic drums in a warehouse adjacent to the Sigma Facility. The drums contained a nitric acid mixture recovered from the Sigma Facility's electroplating baths that are under refurbishment. They reported their discovery and emergency management personnel and the hazardous materials team responded. While the situation did not trip any emergency action levels, the Emergency Operations Center activated in monitoring mode and directed a precautionary evacuation of Sigma and the Beryllium Technology Facilities. The hazardous materials team used a remotely operated robot to vent the two drums and manually vented a third drum containing a hydrochloric acid mixture. On Monday, Triad personnel held a fact-finding and discussed issues concerning chemical management, aisle spacing, and other factors concerning drum storage.

Radiological Laboratory Utility Office Building: Last Thursday, all critical electrical loads were lost while workers performed a preventive maintenance task on the uninterruptible power supply. The issue resulted from an error in the work package. Key systems lost included ventilation, most communication systems, computer networks, and facility condition monitoring. Operations center personnel directed an evacuation of radiological areas of the facility which went smoothly despite the lack of the public address system. Power was restored in approximately 30 minutes. Facility management is evaluating means to improve work control for critical tasks, such as this one, that have high potential impacts on operations.

Last month, Triad engineering personnel completed system adequacy analyses of the ventilation, air supply, and fire suppression systems. The analyses compare the as-found systems against the minimum codes and standards required for operations as a future Hazard Category 3 (HC-3) nuclear facility. The analyses identified 6 observations and 1 requirement that could not be verified for the fire suppression system and 5 observations and 3 requirements that could not be verified for the ventilation and air supply. An example of an observation is that the ventilation system contains non-fire rated flexible connectors contrary to DOE and industry requirements. An example of a requirement that could not be verified is whether the sway bracing on the fire suppression system meets current seismic criteria. Engineering personnel are developing strategies to physically or administratively remedy each of the identified issues.

Area G–Operations: On Wednesday, N3B personnel commenced liner pull operations in Building 412. The EM Field Office approved the restart of operations last week after concluding that a federal readiness assessment was not required if operations remain at or below the HC-3 quantities of material-at-risk.

Area G–Readiness: N3B personnel determined that a federal and contractor readiness assessment is required for the retrieval and staging of corrugated metal pipes containing condensed, cemented waste from the former TA-21 Radiological Liquid Waste Facility. A safety basis addendum to support this task is in progress. These pipes were buried in Area G in the 1980s. Size reduction and packaging of these pipes will be treated as a separate activity with different safety basis and readiness activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 11, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 11, 2019

DNFSB Staff Activity: The Resident Inspectors were in Washington, D.C. to brief the Board and attend meetings. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 18, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 18, 2019

DNFSB Staff Activity: Members of the Board's staff held teleconferences with both field offices and contractors in support of a complex-wide review on the implementation of Technical Safety Requirements.

Plutonium Facility–Transuranic Waste Management: Last Tuesday, a third incident occurred involving a dropped transuranic waste container (see 9/20/2019 and 9/27/2019 reports). While workers were lifting a pallet with an electric jack, an unrestrained pipe overpack container fell off. The container was not damaged. Triad management subsequently instituted a new pause on drum handling activities. This Thursday, they issued a recovery plan that authorizes drum movements when released by management with compensatory measures including: (1) work must be overseen by both a non-working person-in-charge and approved enhanced temporary oversight; (2) only a specific list of drum handling equipment is allowed; and (3) workers must complete revised training on drum handling. Longer-term corrective actions include an extent of condition review and a formal causal analysis.

Plutonium Facility–Safety Basis: On October 4, 2019, Triad safety basis personnel transmitted to the NNSA Field Office for approval a revision to the evaluation of the safety of the situation regarding the interaction between nitric acid and polyols (see 9/13/2019 report). The revision acknowledges the potential for an event that is more severe than envisioned in DOE-STD-5506-2007 based on experience since the standard was issued. As such, Triad included an autocatalytic exothermic runaway reaction similar to an explosion that they modeled using an airborne respirable release fraction of 0.07. This value results in calculated offsite consequences that exceed the DOE Evaluation Guideline. As a result, Triad proposed preventing the accident using a Specific Administrative Control that prohibits the mixing of polysaccharides with greater than 12 molar nitric acid. Triad also previously asserted that these materials are not present in the existing population of waste containers.

Area G–Safety Basis: For comparison, N3B analyzes energetic chemical reactions like the polyol issue using a release fraction about 130 times lower than the value proposed by Triad. Accordingly, the same potential accident at Area G, which is closest to the site boundary, does not challenge the Evaluation Guideline. As a result, N3B does not explicitly credit controls to prevent or mitigate this hazard. The EM Field Office continues to support this position.

Last month, N3B transmitted a strategy for development of revision 7 of the Basis for Interim Operations. This strategy supplants the April 2019 proposal that the EM Field Office did not formally address (see 7/5/2019 and 9/13/2019 reports). Key aspects of the strategy for revision 7 include: (1) reliance on DOE-STD-3011-2002, DOE-STD-3009-94, and DOE-STD-5506-2007; (2) incorporation of atmospheric dispersion parameters and hazard analysis information from the abandoned safety basis that was developed using DOE-STD-3009-2014; (3) use of an updated statistical analysis for the aboveground waste inventory, and (4) removal of underground waste retrieval operations. The overall schedule assumes an exemption from the annual update requirement for 2020 and shows deliverables to the EM Field Office beginning in December 2019 with overall completion and implementation in calendar year 2021. The EM Field Office is reviewing this strategy.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 25, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 25, 2019

DNFSB Staff Activity: The resident inspectors met with a team from the Government Accountability Office as part of their review of DOE Order 140.1 and its effect on the Board's ability to meet its statutory responsibilities.

Nuclear Criticality Safety: On Wednesday, the team leader out-briefed the preliminary results of the management assessment on the nuclear criticality safety program at the Plutonium Facility. The team, which included external membership, identified one finding concerning an inappropriate approval of a change during contract transition to the roles and responsibilities in the institutional program document. They also identified 11 opportunities for improvement, including: developing an implementation matrix; the institutional Nuclear Criticality Safety Committee is not satisfying all elements of its charter; strengthening the identification of assumptions in evaluations; and the procedures and records associated with the fissionable material holdup program either have not been developed or have not been reviewed by the Nuclear Criticality Safety Division. The team also identified six noteworthy practices including: a sound staffing plan; a commendable commitment to hands-on criticality training; and a sound vision for the criticality safety officer program.

Plutonium Facility–Safety Basis: Early in October, Triad personnel discovered five additional pipe overpack containers (POC) containing cheesecloth and greater than 10 grams of heat-source plutonium. Following a 2017 potential inadequacy of the safety analysis, POCs with cheesecloth have been limited to 10 grams of heat source plutonium (see 2/3/2017). When the evaluation of the safety of the situation was developed in 2017, there were five known POCs with greater than 10 grams. These were exempted from the limit as thermal modeling suggested POCs up to 25 grams would be acceptable, however the limit of 10 grams was chosen for conservatism and to comply with onsite transportation limits. The discovery of the five additional POCs triggered entry into a limiting condition of operation which requires that the POCs be repackaged immediately. Triad is currently working on a capability to repackage these containers in a tent, which is scheduled to be completed in late November. However, Plutonium Facility senior management is concerned about the substantial worker hazards involved with repackaging heat source plutonium without robust engineered controls. They therefore directed work on a parallel path to amend the safety basis to allow additional exempted containers for the NNSA Field Office's consideration. All of the new POCs contain well below 25 grams of heat source plutonium.

Flanged Tritium Waste Containers (FTWC): Last Friday, Triad transmitted the addendum to the packaging and transportation safety document supporting moving FTWCs from Area G to the Weapons Engineering Tritium Facility to the NNSA Field Office for approval. They also transmitted a revision to the safety basis addendum for Area G which will be reviewed by both field offices with the EM office as the final approval authority.

Area G–Readiness: N3B personnel determined that both federal and contractor readiness assessments are required for resumption of additional sort, segregate, and size-reduce activities which have not been performed since 2014. The activities to be resumed include draining liquids from drums, stabilizing free liquids, and remediating prohibited items and will be performed in a glovebag within a Perma-Con in Dome 231

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 1, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 1, 2019

Organizational Learning: On Wednesday, Triad management paused all “Jack and Roll” activities across the laboratory to hold a series of briefings. Triad defines “Jack and Roll” as the use of specialized equipment to vertically or horizontally move materials where the possibility of upset exists. Notably, this category excludes the drum handling activities discussed below, including the “tip and roll” maneuver, which were recently paused at the Plutonium Facility. Triad’s briefings included a review of significant recent abnormal events at the laboratory, as well as a near-miss at the Idaho National Laboratory. They emphasized ongoing collaborations with other sites to compensate for a regulatory void, reinforced policy expectations, and highlighted available mechanisms for assistance.

Plutonium Facility–Transuranic Waste Management: On Wednesday, Triad management released most work teams from the requirement of enhanced oversight for drum handling (see 10/18/2019 report). However, management has not lifted the expectation that crews are overseen by a non-working person-in-charge.

Area G: Earlier this month, N3B personnel provided the Central Characterization Project (CCP) with additional information concerning five of the containers with non-conformances against the Basis of Knowledge (see 8/9/2019 report). CCP is reviewing the information, as well as information previously provided by Triad. Thus far, N3B has been unable to find additional mitigating information associated with the other 19 non-conforming containers, including the two containers that CCP conservatively determined to contain organic cat litter and neutralized nitric acid. As a result, N3B plans to eventually treat these containers, along with several hundred other aboveground containers that have reactive or ignitable waste characteristics and are prohibited for safety reasons from the Waste Isolation Pilot Plant.

Plutonium Facility–Radiological Control: Two weeks ago, a continuous air monitor alarmed in a containment tent associated with the refurbishment of a plutonium-238 glovebox. All workers were in respiratory protection and there was no evidence that contamination spread out of the tent. Last Friday, a worker in the room, but not working in the tent, found contamination on their personal protective equipment during exit monitoring. Investigation discovered the most probable source of the contamination was a torn waste bag containing components from the glovebox refurbishment. Workers at the fact finding noted that planning for waste disposition should be improved to avoid situations where materials are staged in bags on the floor for extended periods of time. Waste management personnel are evaluating how to accomplish this while meeting visual examination requirements for transuranic waste.

Sigma Facility: On Thursday, the NNSA Field Office issued a letter rejecting Triad’s revised Final Hazard Categorization and criticality safety evaluation for the facility. NNSA personnel had several issues with the accuracy and completeness of the submitted documents which were intended to provide more flexible limits while precluding the potential for an inadvertent criticality accident through a nature of process argument. The field office requested Triad to revise and resubmit the documents for re-review and approval.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 8, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaeue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 8, 2019

DNFSB Staff Activity: R.L. Jackson and Y. Li observed the Plutonium Facility Seismic Performance Reassessment workshop. This workshop covers the non-linear dynamic analysis.

Plutonium Facility–Operations: Last Wednesday, during chlorination activities, the lower-threshold room alarm for chlorine gas activated. The approximately 12 workers in the room promptly evacuated, reported the alarm to the operations center, noted the smell of chlorine, and awaited radiological control technician support. At the fact-finding, workers noted that the chlorine system recently passed a leak test and completed a run successfully. However, a portion of the system had been locked out for maintenance during that test and had not been retested after being returned to service. Facility personnel are doing a full inspection and test of the chlorine piping and it remains locked out at the source bottle until those results are satisfactory.

Transuranic Waste Management: On Thursday, the NNSA Field Office unconditionally approved Triad's evaluation of the safety of the situation regarding autocatalytic exothermic chemical reactions involving polysaccharides and nitric acid (see 10/18/2019 report). This is the first approved safety basis document at LANL that quantitatively analyzes the potential consequences associated with an energetic chemical reaction involving transuranic waste using an overall respirable release fraction of 0.07. The resident inspectors note that this approach might apply to other facilities that have the potential to generate or receive transuranic waste containing polysaccharides that have contacted nitric acid, such as the Chemistry and Metallurgy Research (CMR) Building, Radiological Laboratory Utility Office Building, Transuranic Waste Facility, and Area G.

Nuclear Criticality Safety: On Thursday, NNSA personnel out-briefed their assessment of Triad's implementation of their program improvement plan. They noted a number of positive developments including improved quality and output of evaluations, strengthened relationships with operations, good timeliness of annual reviews, and evaluation backlog reduction is progressing as scheduled. The four member team also identified three preliminary findings associated with: (1) scheduling program assessments to ensure all elements are covered at least once every three years; (2) incomplete functioning of the institutional Nuclear Criticality Safety Committee; and (3) lack of a plan/procedure to identify and evaluate inadvertent holdup of fissionable materials. Of note, Triad's recent management assessment identified the issues associated with the last two findings as opportunities for improvement (see 10/25/2019 report).

Flanged Tritium Waste Containers (FTWC): On Wednesday, Triad safety basis personnel submitted to the NNSA Field Office the third safety basis document supporting the project to vent and move FTWC containers stored at Area G. This addendum covers receipt and remediation of the FTWCs to the Weapons Engineering Tritium Facility. The current schedule estimates FTWC venting will occur in mid-March 2020.

CMR–Risk Reduction: Earlier this year, Triad hired a subcontractor to begin materials removal, primarily as low-level or non-radiological waste, from CMR to support future decontamination and demolition. The current scope of work is primarily focused in the unused Wings 2, 3, and 4, and attic areas of other wings. A second subcontractor is beginning work to perform bulk disconnects of electrical utilities in unused wings. The second phase of work, which should begin in the middle of next year will involve more invasive work including development of decontamination procedures, glovebox removal, hood removal, and limited scope removals of ventilation and piping.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 15, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 15, 2019

Transuranic Waste Management: Last week, the Central Characterization Program (CCP) suspended waste certification activities at LANL following questions concerning the accuracy of acceptable knowledge documentation. The concern involved the presence of unreacted calcium metal in salt residues from the direct oxide reduction (DOR) process. DOR uses excess amounts of calcium metal as an initial reactant meaning that some will remain after completion of the process. Under certain circumstances, calcium metal can pose a pyrophoric reactive hazard, which is prohibited by the waste acceptance criteria for the Waste Isolation Pilot Plant (WIPP). As a result, certain Triad waste generating activities in the Plutonium Facility, as well as WIPP shipments from LANL, were also curtailed.

On Tuesday and Wednesday, personnel from NNSA and EM Headquarters, the Carlsbad Field Office, CCP, Triad, N3B, and both local field offices held discussions to resolve the situation. They concluded that insufficient evidence of a reactive calcium hazard exists to warrant continued suspension of waste generating and certification activities. However, waste containers with DOR salts are being held pending additional analysis, documentation, and the completion of testing. Notably, they identified the need to update the waste database to include additional information on when and how items were generated. Overall, management developed an action plan and committed to increased teleconferences to strengthen communications. In the opinion of the resident inspectors, management missed an opportunity to identify the process and procedural deficiencies that contributed to the situation. In particular, management deferred discussions on reviewing the formal interface agreement and ensuring acceptable knowledge documents generated by Triad and CCP correctly reflect processes.

Area G: On Thursday, the situation discussed above contributed to a decision to unload two previously prepared shipments of transuranic waste destined for WIPP. In this case, N3B needs to verify the absence of DOR salts in the shipments, which could not be accomplished prior to exceeding shipping container time constraints. N3B relies on Triad to access many of the processing records and procedures necessary to review the origins of the waste at Area G.

Emergency Management: On Wednesday, Triad conducted their annual full-scale exercise. The scenario involved multiple security threats including regional and local attacks to the power grid, drone incursions into laboratory airspace, cyberattacks, an active shooter at the Radiochemistry Facility, and explosive devices on laboratory property. This was the first full scale exercise to practice activation of the Policy Group, a gathering of federal and contractor senior managers intended to provide strategic decision-making and support, but not direct management of the incident. Policy Group members noted a need to better define the roles and responsibilities of this group.

Last Wednesday, Triad transmitted their after-action report for last year's annual full-scale exercise (see 9/27/2019 report). There were no findings, six deficiencies, 23 opportunities for improvement, and one noteworthy practice. Four of the deficiencies related to fire department command and control at the TA-49 wildfire scene. They also noted a repeat issue concerning lack of reliable cell phone and radio communications in the Emergency Operations Center.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 22, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 22, 2019

DNFSB Staff Activity: M.W. Dunlevy and P.J. Migliorini, supported by other staff via teleconference, conducted reviews associated with transuranic waste management in Triad and N3B nuclear facilities. They also walked down the Plutonium Facility.

Area G–Safety Basis: Last Friday, the EM Field Office unconditionally approved N3B’s strategy for upgrading the safety basis (see 10/18/2019 report). On Thursday, N3B submitted to the EM Field Office for approval a safety basis addendum to support retrieval and storage of the corrugated metal pipes. The addendum proposes new Specific Administrative Controls for the activity associated with material-at-risk, refueling, crane standoff, and elevated waste movements and critical lifts. N3B requested approval by the end of this calendar year in order to support retrievals beginning in May 2020. The field office is reviewing the addendum.

Transuranic Waste Facility (TWF): Earlier this month, TWF personnel successfully completed replacement of the safety class seismic power shutoff system. The new system remedies deficiencies with the original. Effective use of TWF is essential to improving safety at the waste generating facilities; however, personnel continue efforts to rectify several features of this new facility to enable its intended use, including: a replacement firewater pump is scheduled to be installed next year in hopes of eliminating a water flow anomaly needed to support upgrading the fire suppression system to safety significant; plans remain to convert the dry-pipe system from nitrogen to air to eliminate an asphyxiation hazard; and planning to establish the intended characterization functions after personnel determined that the assay trailer could not be used because designers did not account for spacing with the adjacent radiography trailer—the radiography trailer could not itself be used because of equipment issues and will be replaced and likely relocated to outside of the Plutonium Facility.

Confinement Vessel Disposition: Earlier this month, project personnel completed debris removal on the ninth vessel. This is the last vessel known to contain significant quantities of nuclear material, and its cleanout generated 85 drums of transuranic waste. The removal of these waste containers is currently hampered by some of the outstanding issues at TWF discussed above. The eventual removal of these waste containers from the Chemistry and Metallurgy Research building will represent a step improvement to the facility’s safety posture because of the reduction in material-at-risk.

Plutonium Facility–Safety Basis: Last Wednesday, Triad submitted to the NNSA Field Office for approval a revision to the evaluation of the safety of the situation related to heat source plutonium and cheesecloth (see 10/25/2019 report). This revision includes 55 gallon drums in addition to pipe overpack containers and increases the heat source plutonium limit in containers from 10 grams to 28 grams. The NNSA Field Office is reviewing this submittal.

On Monday, Triad submitted to the NNSA Field Office a temporary safety basis modification to support use of a crane at a non-nuclear construction site adjacent to an outdoor transuranic waste storage pad. Use of a crane was identified in the original hazard analysis for construction, but potential impacts on the waste pad were not analyzed. The temporary modification concludes that a crane impact on waste drums does not create consequences that would drive additional controls. The NNSA Field Office approved the temporary modification on Thursday.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 29, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 29, 2019

N3B–Organizational Learning: On Saturday, N3B senior management paused all work following three concerning events that occurred last week. They held a series of all hands meetings for the workforce on Monday to go over the events, their safety implications, and the importance of disciplined operations. The first event occurred last Tuesday when a subcontractor sent soil samples from TA-21 with improper markings and paperwork due to a calculation error regarding the amount of radioactivity in the samples. This error was discovered when the samples arrived at the Sample Management Office. The second, and most significant, event occurred at a groundwater sampling well. The crew was having trouble keeping a pump running so they bypassed an interlock that kept the 480 volt control panel shut while it was energized in order to reset the pump. The crew then opened the energized panel repeatedly throughout the shift to reset the pump. The final event involved potentially contaminated personnel at Area G. A worker brushed up against equipment and opted to do precautionary contamination monitoring. The monitor detected contamination resulting in a shelter-in-place at Area G. Later analysis discovered that the contamination was naturally occurring radon. For this event, management emphasized the positive questioning attitude of precautionary monitoring, but also noted that there were other changing conditions in the job area that warranted questions. No workers were injured or hazardous materials released in any of these events. The all hands meetings emphasized the importance of stop and pause work authority, pausing and questioning when conditions change, and the integrated safety management system for planning and executing work. Several workers at one meeting expressed concern with the recent change to exit monitoring requirements at Area G (see 9/20/2019 report). Area G management resumed limited activities on Tuesday. Electrical work currently requires senior management approval for release.

Environmental Management Field Office: As of last month, the EM Field Office's four authorized positions for facility representatives are unfilled. The current field oversight staffing has dropped to one technical assistance contractor performing functions similar to a facility representative. Previously there was one federal facility representative supported by two technical assistance contractors. While the office works to hire and qualify additional facility representatives, oversight is being prioritized to operations in Area G.

Performance Management: The NNSA Field Office's performance evaluation and measurement plan for Triad provides a framework including goals, objectives, and key outcomes. This fiscal year, each of the four programmatic goals includes a key outcome to execute the programs safely, securely, and compliantly with an emphasis on conduct of operations and waste management during program execution. The mission enablement and leadership goals also include key outcomes focused on: executing the transuranic waste management system to support off-site shipments; implementing actions to drive cultural change, including subcontractors; and implementing performance indicators associated with conduct of operations, criticality safety, safety basis, emergency management, and work planning and control.

The EM Field Office continues to develop their fiscal year 2020 performance plan for N3B. This plan is important to establish certainty regarding safety-related objectives; however, timely approval has been challenging due to a number of factors. For example, last year's plan was officially signed in February 2019 (see 3/8/2019 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 6, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plae and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending December 6, 2019

Plutonium Facility–Conduct of Operations: Last month, machinists and quality inspection personnel moved a machined part to a location different from the location they had planned in the nuclear material control and accountability system. The next day, other workers declared a process deviation during a pre-movement walk-down when they identified that the posted inventory sheet did not match the as-found condition. Criticality safety personnel recommended an infraction severity index of level 5, since all controls remained intact. At a follow-up fact-finding held this Monday, personnel involved in this process deviation self-identified a number of significant conduct of operations issues, including failures to: (1) assign a person-in-charge for the material move; (2) conduct a pre-job briefing for the move; (3) complete the use-every-time attachment required for the material move; (4) post the updated inventory sheet to the correct glovebox; and (5) correctly verify the as-found glovebox inventory when updating the posting. Management suspended the qualifications of the individuals involved and planned other corrective actions to include evaluation of the material move procedure and spot audits to ensure completion of the required attachment for material moves. The material move procedure has been revised about ten times since the plant-wide pause of operations in 2013 in order to improve execution and reduce the potential for worker error.

Transuranic Waste Facility (TWF): This week, TWF personnel completed security upgrades to each of the waste storage buildings to accommodate greater flexibility with respect to the storage of waste containing low-grade materials. However, TWF and Central Characterization Program personnel continue to work through the associated challenges of requiring cleared workers, restrictions on electronics, and new access controls.

Plutonium Facility–Safety Basis: Last week, a four person team completed an Implementation Verification Review of the updated safety basis (see 3/1/2019 report). This updated safety basis addresses long-standing conditions of approval, modernizes the hazards analysis, and consolidates multiple safety basis documents. The team verified that new or changed controls from the revised safety basis were incorporated into the appropriate procedures and that facility personnel at all levels understand the new controls and requirements. The team identified two findings: (1) several procedures that have not been fully updated or contain errors and (2) a self-identified issue that the new in-service inspection for plutonium ion exchange resins was not completed since the procedure is not ready. The team concluded that all review objectives were met and the new safety basis is ready for implementation with the exception of a few procedures that need revision and three activities excluded from scope that will remain under the current safety basis. Facility management is reviewing the team's report.

Flanged Tritium Waste Containers (FTWC): On Thursday, the NNSA Field Office unconditionally approved the safety basis addendum to the Weapons Engineering Tritium Facility supporting receipt and remediation of FTWCs from Area G. The safety basis documents supporting venting at Area G and transportation from Area G are still under review.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 13, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending December 13, 2019

Plutonium Facility–Readiness: Last Friday, Triad management requested NNSA Field Office approval on a proposal to maintain operational readiness of the TA-55 Mobile Loading Unit (MLU). Triad personnel last operated the MLU in October 2018 and would ordinarily be required to conduct a readiness review prior to restarting nuclear operations in accordance with DOE Order 425.1D. However, Triad is proposing to credit the ongoing loading operations at the RANT Shipping Facility for operational proficiency of MLU. Their argument is that the same personnel perform both activities using similar procedures. The primary difference is that MLU operations involve the use of a mobile crane that is operated by workers that do not work at RANT. Triad also proposed establishing a Senior Supervisory Watch for future MLU operations. The NNSA Field Office is reviewing the proposal.

On Wednesday, Triad convened their Joint Evaluation Team to evaluate a proposal to consider a new, one-time shipping cask loading activity as an expansion of MLU operations. The two operations are inherently similar; however, Triad expects to submit a safety basis addendum for the new casks as there are differences with the materials being loaded, the location for the loading, the shipping container and trailer, and the work crew associated with the shipping container. The team concluded that the activity qualified as an expansion of an existing capability and as such does not require a readiness review—pending approval of the proposal discussed above. Of note, neither DOE Order 425.1D nor the associated DOE-STD-3006 provide explicit guidance related to the definition of an expansion of an existing capability, which has previously created confusion at LANL (see 8/31/2018 and 5/5/2017 reports).

Plutonium Facility–Safety Systems: On Sunday, facility operations personnel detected an apparent fault condition with the safety-significant Criticality Incident Detection and Alarm System and entered the limiting condition for operation by placing the facility into Mode 2—Standby. At the time, no work was underway. On Monday, vendor support personnel replaced a power supply and the facility resumed operations that evening. Facility management determined that since the fault was with a power supply that did not have credited functionality, their retrospective view was that the system was never degraded. As a result, facility management concluded this event did not meet any of the criteria for internal institutional or external reporting.

Flanged Tritium Waste Containers (FTWC): On Tuesday, the EM Field Office, with concurrence from the NNSA Field Office unconditionally approved the safety basis addendum that allows venting and handling of the four FTWCs. Credited controls to reduce the risk to workers from a FTWC deflagration include two design features, the FTWC and a relief valve orifice, as well five specific administrative controls.

On Thursday, personnel at the Weapons Engineering Tritium Facility (WETF) held their quarterly emergency drill. The scenario was an explosion of a FTWC from Area G upon arrival at WETF. The explosion injured a worker and caused a release of tritium. The coached training drill will be used for further development of processes to handle FTWCs from Area G at WETF.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 27, 2019

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending December 27, 2019

The Year on a Page: A summary of the key developments of 2019.

- Triad completed 15 shipments of transuranic waste to the Waste Isolation Pilot Plant after restarting operations at the RANT Shipping Facility. They are working to increase the weekly pace of shipments and eventually integrating N3B shipments from Area G.
- Confinement Vessel Disposition project personnel completed cleanout of the last sphere. This represents completion of the last action resulting from the Board's Recommendation 94-1 *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex*. As a result, the Chemistry and Metallurgy Research building is postured for a near-term significant reduction in material-at-risk as the exit strategy advances.
- Plutonium Facility personnel completed upgrades to eliminate seismic interaction hazards from the fire suppression system piping. This represents an important step toward ultimately qualifying the system for service in a performance category 3 seismic event; however, additional out-year efforts remain associated with reanalyzing the piping, installing additional bracing as needed, and separating the non-seismically qualified buildings from the fire water loop.
- NNSA completed testing of two column capital specimens and advanced the nonlinear dynamic analysis to improve the understanding of the seismic performance of the Plutonium Facility. NNSA began these efforts in 2012 and they are notionally scheduled to inform the safety basis in 2023.
- In its third year of operations, the utilization of the Transuranic Waste Facility reached about 40 percent of capacity. Facility personnel completed replacement of the seismic switches and continue longstanding efforts to upgrade the fire suppression system to safety significant, convert the dry pipe system from nitrogen to air, and establish the waste characterization capabilities that were deferred from the original project.
- Triad took steps in support of the production mission including: implementing a new safety basis for the Plutonium Facility that addresses long-standing conditions of approval and helps consolidate safety basis documents; strengthening plan of the day processes; reducing the backlog of criticality evaluations; and advancing the upgrade of the Radiological Laboratory Utility Office Building to a hazard category 3 nuclear facility.
- Triad personnel vented one of the three Flanged Tritium Waste Containers that have the potential for explosive headspace mixtures of oxygen and hydrogen isotopes that are stored at the Weapons Engineering Tritium Facility. They also received approval for three safety basis documents needed to support the venting and disposition of the four similar containers currently stored in a shed at Area G. They plan to execute these activities in spring 2020.
- At Area G, N3B executed 12 mobile loading shipments and restarted limited open container remediation capabilities. They also began a multi-year effort to upgrade the legacy safety basis after the EM Field Office mostly abandoned the new safety basis developed during the past 4 years using DOE-STD-3009-2014.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 3, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 3, 2020

Performance Management: Last month, NNSA approved the Performance Evaluation Report for fiscal year 2019. Overall, NNSA rated Triad as “Good” with a 66 percent score. The score was impacted by challenges in the nuclear threat reduction and operations and infrastructure goals. Of interest to the defense nuclear facilities, NNSA noted increased sensitivity to entry into the New Information process; a high-level of responsiveness to safety basis quality issues; numerous challenges with construction project management, schedule execution, and oversight; continuing conduct of operations issues; struggles implementing an effective transuranic waste management program; and schedule delays for the disposition of the Flanged Tritium Waste Containers at Area G.

Radioactive Liquid Waste Treatment Facility (RLWTF): Triad inherited from the predecessor contractor challenges associated with the projects for the low-level liquid waste (LLW) and transuranic liquid waste (TLW) enduring capabilities that are necessary to replace the RLWTF built in 1963. In particular, the LLW effort achieved project completion in November 2018; however, Triad’s current estimate for transition to radiological operations is 2022 based on the need to complete a number of equipment modifications required for operations. The TLW effort has recently resumed development of Critical Decision 2/3. Based on process equipment refurbishment efforts completed in 2005, Triad believes the existing system can support operations until approximately 2034.

Transuranic Waste Management: Last month, EM and NNSA jointly responded to the New Mexico Environment Department’s request for additional information on transuranic waste containers that had received non-conformances against the Basis of Knowledge for the Waste Isolation Pilot Plant. The response provides additional details on seven containers and states that based on current information five of the containers do not exhibit ignitable, corrosive, or reactive hazards. There is insufficient information for the other two containers which will require future characterization and remediation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 10, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 10, 2020

Federal Oversight: On Monday, Mr. Michael Weis became the manager of the NNSA Field Office. He briefed his 30-60-90 day plan to understand, evaluate, and optimize field office operations.

Plutonium Facility–Infrastructure: Last month, Triad issued the annual update for the TA-55 Project Execution Strategy (see 1/4/2019 report). Overall, Triad’s projections to achieve the desired end-states for the ventilation and fire suppression systems remain in fiscal years 2025 and 2026, respectively. Key accomplishments for fiscal year 2019 include:

- Completion of seismic evaluations for the electrical distribution and instrument air systems
- Commenced Phase I testing of column capitals at the University of Nevada, Reno
- Completed seismic analyses for six clusters of gloveboxes
- Resolved seismic interaction issues with the fire suppression system (see 9/27/2019 report)

The recommended scope for work in fiscal year 2020 includes:

- Remediating ventilation penetrations with approved firestop systems
- Commissioning the diesel generators and accoutrements supporting the electric firewater pumps
- Continuing column capital testing
- Evaluating additional supports needed to bring the fire suppression system to seismic design category 3, limit state C

Area G: On Tuesday, N3B management declared a potential inadequacy of the safety analysis after identifying a discrepancy between the waste container array aisle spacing described in the approved safety basis and the as-found configuration of the facility. Specifically, the safety basis states that aisle spacing is 36 inches due to regulatory requirements, which a supporting fire protection calculation conservatively treats as 28 inches. However, the actual regulatory requirement and facility practice is 24 inches. Safety basis personnel determined that the decreased spacing results in an increased number of waste containers that could be impacted by a potential fuel pool fire. Their preliminary calculations indicate increased mitigated doses to the public and the collocated worker, but these increases do not exceed any DOE criteria. As a result, facility management concluded that no compensatory measures were needed, but identified corrective actions to evaluate the extent of this condition in the command media and other safety basis calculations.

Transuranic Waste Management: This week, Triad personnel completed their first two shipments since early October 2019 from the RANT Shipping Facility to the Waste Isolation Pilot Plant (WIPP). Shipments had been impacted by container movement issues, concerns about pyrophoric materials, and an equipment issue at WIPP. They plan to execute two shipments each week until the annual WIPP maintenance outage in mid-February. Following the outage, they are exploring increasing the shipping cadence to three shipments per week if it can be sustained by the rate of container certification. N3B also has not shipped since October 2019 and is not currently included on the WIPP shipping schedule. They have a certified container population sufficient for about 50 shipments and continue to work with Triad to resolve integration processes to support co-mingled shipping operations at RANT.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 17, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 17, 2020

Plutonium Facility–Operations: Last week, during the first use of the chlorine system since a previous system leak (see 11/8/2019 report), the chlorine alarm activated and workers responded as required. The system had been successfully pressure tested in late November using a revised procedure and a new failure criterion. Facility management has suspended chlorination activities pending determination of the cause of the alarm and additional leak inspections.

Triad personnel have nearly completed installation of a newly designed replacement chlorine delivery system. The new system features several improvements including predominantly welded construction, new safety interlocks that include automated shutdown and argon purging, and construction using mostly Monel components. The new system is expected to be operational this summer.

Radiological Laboratory Utility Office Building (RLUOB): Last month, a janitor performing routine floor cleaning activities in a radiologically controlled area discovered contamination on his protective bootie during an exit survey using a personnel contamination monitor (PCM). Radiological control personnel further investigated and discovered that the contamination was promethium-147, which is primarily a beta emitter. This radionuclide is detectable by PCMs and most hand-held devices used by radiological personnel, but is not detectable by the hand and foot monitors or continuous air monitors in the facility, since it predominantly handles alpha emitters. At the fact-finding meeting this week, involved personnel noted that the radionuclide had been used for a project several years ago, but remained in the back of a fume hood pending a waste disposition path. Management identified corrective actions including: determining the current inventory of beta emitting isotopes in RLUOB; developing a process to inform radiological protection personnel when new beta emitting isotopes arrive at the facility; and determining disposition paths for non-routine waste streams.

Area G: N3B personnel recently resolved most of a backlog associated with inspection, testing, and maintenance (ITM) activities for fire protection systems in the facility. In October 2019, a N3B management assessment determined that 8 of 12 categories of fire protection systems had delinquent ITM activities. Examples of the delinquencies include: all 3 of the fire alarm panels were missing their annual inspections; all 12 of the major lightning protection systems were missing their annual inspections; and all 5 of the gaseous suppression systems were missing all of their required ITM activities. While none of these fire suppression systems are credited in the approved safety basis, N3B management elected to implement compensatory measures, such as fire watches, while maintenance personnel completed the ITM activities.

Power Outage: On Monday, electrical power from one of the laboratory's primary high voltage feed lines was lost for about an hour subsequent to Triad personnel attempting switching operations following corrective maintenance. Numerous facilities were impacted including the Plutonium Facility, Chemistry and Metallurgy Research building, and the DNFSB onsite office. Facility personnel did not report any issues with the response. Utility personnel are investigating the cause of the outage.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 24, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 24, 2020

DNFSB Staff Activity: P.J. Migliorini supplemented the onsite office this week. On Thursday, a staff team conducted a teleconference with personnel from the NNSA Field Office and Triad. The discussion supported a complex-wide examination of how 10-year natural phenomena hazard updates are executed and integrated into facility safety bases.

Transuranic Waste Operations: On Thursday, Triad personnel declared a potential inadequacy of the safety analysis for the Transuranic Waste Facility associated with the use of a spatula-like tool for headspace gas sampling of waste containers (see 12/20/2019 report). This sampling is a part of the certification process needed to send waste containers to the Waste Isolation Pilot Plan and is performed by Central Characterization Program personnel. About sixty percent of Triad's existing container population awaits this testing. Gas sampling activities remain paused in Triad facilities. This issue has not affected gas sampling activities at Area G, which remain ongoing using the same tool.

Readiness: On Wednesday, Triad personnel executed their Joint Evaluation Team process to evaluate the level of formal readiness review for upcoming new activities. The team concluded that a new hot press and a new repack, consolidate, and discard operation constituted expansions of existing capabilities because they were substantially similar to ongoing operations. As a result, Triad will be proposing to the NNSA Field Office that these activities do not require a formal readiness review. The team also reviewed the planned upgrade of the Radiological Laboratory Utility Office Building to a hazard category 3 nuclear facility. They determined that this change in operating status warranted an NNSA Operational Readiness Review.

Radiological Laboratory Utility Office Building: Triad personnel continue to investigate system adequacy and develop proposed remedies for gaps between the as-built systems and the codes and standards required for operation as a hazard category 3 nuclear facility (see 10/4/2019 report). In addition to these efforts, as part of the periodic update to the fire hazards analysis, fire protection engineers have identified significant deficiencies in the fire barriers throughout the building, including stairwells, elevator shafts, doorways, floor-to-floor penetrations, and 2-hour fire rated barriers separating fire areas. Triad has commenced additional extent-of-condition reviews, repairs, and compensatory measures since these deficiencies challenge life safety and fire protection code requirements.

Federal Oversight: A six person team consisting of senior federal and contractor personnel from other DOE and NNSA sites performed a Radiological Waste Peer review for both the NNSA Field Office/Triad and the EM Field Office/N3B. These reviews are happening across the DOE complex and are intended to be complementary to waste reviews being performed by the DOE Office of Enterprise Assessments. The peer review used a model similar to the NNSA Governance Peer Review (see 9/27/2019 report) in that it consisted primarily of discussions with federal and contractor personnel with a goal of identifying best practices and lessons learned to strengthen radioactive waste practices and processes. A key item noted by the team in their outbrief was for the EM and NNSA Offices and their respective contractors to continue efforts to better integrate their waste management missions. The review team plans to issue a final report in mid-February; a report that consolidates results from all of the assessed sites will follow.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 31, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 31, 2020

Plutonium Facility–Fire Protection: Earlier this month, subcontractor personnel started installing new fire doors between the laboratory rooms and the corridors. As of this week, approximately half of these doors are partially installed. The new doors currently lack astragals, leaving substantial exposure gaps. Some of the doors are also not aligned correctly and do not properly self-close or self-latch. These conditions will need to be resolved in order to credit the doors in the fire hazards analysis and safety basis in the future.

Facility personnel resolved installation issues associated with the anchorage of one of the new seismically qualified backup diesel generators for the electric fire pumps (see 7/28/2017 report). The generator is expected to begin commissioning next week. Once operable, the generator will ease some of the safety basis requirements on the diesel fire pumps. The diesel fire pumps have been undergoing troubleshooting due to recent smoky exhaust, knocking, and lubrication system issues. Triad plans to replace the diesel pumps with delivery expected in October 2020.

Transuranic Waste Operations: Earlier this month, Triad personnel received the results of independent laboratory analyses on surrogate materials intended to verify the acceptability of residue salts from the direct oxide reduction process used to produce plutonium metal (see 11/15/2019 report). The results show that surrogate salts prepared with up to 30 percent stoichiometric excess of calcium metal generate gas with hydrogen concentrations that do not exceed the criteria under UN Division 4.3, *Dangerous When Wet*. As a result, Triad expects Central Characterization Program (CCP) personnel will be able to revise chemical compatibility evaluations to support the certification of waste containers with pyrochemical salt residues generated in process runs using up to 30 percent excess calcium. For greater amounts of calcium or failed runs, Triad is exploring the need to perform additional oxidation campaigns to minimize reactivity and simplify the waste certification process.

Last month, CCP issued a revision to the interface document used to govern their relationship with Triad. The revision includes important corrective actions to ensure Triad subject matter experts review various enhanced acceptable knowledge documents, including chemical compatibility evaluations. In particular, the calcium metal concern discussed above involved factually inaccurate statements that propagated through at least three acceptable knowledge documents.

Last Thursday, Triad safety basis personnel transmitted to the NNSA Field Office an evaluation of the safety of the situation (ESS) concerning the interaction of nitric acid and polysaccharides in the Chemistry and Metallurgy Research building. The ESS provides similar analysis and the same control set as previously proposed and approved for the Plutonium Facility (see 11/8/2019 report).

Area G: On Monday, N3B personnel entered their initial confirmatory process subsequent to Triad's declaration of a potential inadequacy of the safety analysis (PISA) related to using a spatula-like tool during flammable gas sampling operations at the Transuranic Waste facility (see 1/24/2020 report). On Thursday, N3B declared a PISA for flammable gas sampling operations at Area G. Flammable gas sampling, which is performed by CCP personnel, is now paused at Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 7, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 7, 2020

DNFSB Activity: On Friday, NNSA personnel briefed the Board in response to their letter dated November 15, 2019, regarding improvements to the safety posture for the Plutonium Facility.

Plutonium Facility–Transuranic Waste Operations: On Monday, workers appropriately paused work after a radiological control technician measured an unexpectedly high gamma radiation field on a newly generated transuranic waste drum. In particular, a location near the bottom of the drum measured about 650 mrem/h on contact, which exceeded the 200 mrem/h limit established for contact handled transuranic waste. The workers were disposing of waste materials from the americium-241 oxide production operation. Given the potential for high gamma fields associated with this waste stream, the workers had surveyed the individual waste items prior to placement in the drum. At the fact-finding held on Wednesday, participants determined that either a survey error or a change in configuration of a waste item likely contributed to the unexpected condition. They identified corrective actions intended to prevent the generation of high radiation transuranic waste drums, since Triad current currently lacks the capability to repackage these non-compliant containers into a form acceptable for disposal. The corrective actions include evaluation of the radiation survey process, as well as examining the routine use of pipe overpack containers (POC)—which offer greater radiation shielding—for this waste stream.

Plutonium Facility–Formality of Operations: During the fact-finding discussed above, the radiation protection manager aptly noted that materials with elevated gamma fields have the potential to inadvertently activate the nuclear criticality alarm system. While they recently updated a requirements document to reflect an administrative control to prevent this issue, workforce awareness of this control appeared lacking. As such, management took an action to discuss the control in an upcoming briefing.

Transuranic Waste Operations: On Monday, Triad personnel were moving drums from the Plutonium Facility to the RANT Shipping Facility. The load included five POCs from the Offsite Source Recovery Program (OSRP). These POCs do not have the new filter type used to preclude a release from a fire (see 1/25/2019 report). While the contents of the OSRP POCs are not readily dispersible in a fire, the RANT safety basis requires that all POCs have the new type of filter. Verifying filter types is not part of the prerequisite checks prior to shipping to RANT; however, RANT workers do verify filter type to ensure safety basis compliance as part of their acceptance process and rejected these containers. Other OSRP POCs currently stored at the Plutonium Facility use this older filter, which is allowed by the Plutonium Facility safety basis. Triad personnel are evaluating whether to replace all POC filters with the new type rather than changing the RANT safety basis to allow the older filters for OSRP POCs.

Area G: Last Thursday, N3B workers inadvertently knocked a non-radiological mockup of a corrugated metal pipe (CMP) from its cradle with a forklift. The 4.8 metric ton pipe then rolled approximately 12 meters downhill before stopping at a fence. The workers did not inform the operations center of the event, but did move the dislodged CMP mockup to a more stable position perpendicular to the slope. Facility management noted the condition later in the day when driving past and initiated reporting.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 14, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 14, 2020

Transuranic Waste Operations–Safety Basis Inconsistencies: Last Thursday, Triad personnel determined that the potential inadequacy of the safety analysis related to covering drum vents at the Transuranic Waste Facility (TWF) during flammable gas sampling constitutes a positive unreviewed safety question (see 1/24/2020 report). The TWF safety basis requires that transuranic waste container vents be visually inspected and have no evidence of clogging as a surveillance requirement to ensure that the safety-class containers meet their functional requirement to prevent buildup of flammable or other gases. Safety basis personnel determined that the spatula-like tool used to cover the vent during sampling defeats this functional requirement. Flammable gas sampling activities remain paused at TWF; however, gas sampling activities resumed this week at the Plutonium Facility because of differences in safety basis requirements. In particular, the Plutonium Facility safety basis, which credits transuranic waste containers as safety-significant, has a functional requirement to prevent hydrogen buildup, but does not provide any requirements on filter condition or a surveillance requirement related to the adequacy of venting. Flammable gas sampling at Area G also remains paused. The Area G safety basis treats filters in a third way. While venting is not a functional requirement of compliant safety-significant drums, unvented drums are separately defined as a drum with a visibly obstructed vent path. Unvented drums are allowed at Area G, but must be kept in an isolated area with restricted access and cannot be stacked.

Federal Oversight: On Wednesday, EM Headquarters personnel performed a walk-down of Area G with site office technical support contractors. Given low federal staffing at the EM Field Office, headquarters personnel have been providing supplemental support. The team observed criticality safety postings at the high fissile-gram equivalent waste drums storage area, treatment of non-conformance reports, and use of weather protecting tarps over filtered drums.

Radiological Laboratory Utility Office Building: On Wednesday, the NNSA Field Office transmitted their formal comments on the safety basis planned to support operations as a hazard category 3 nuclear facility. Notable comments include that Triad: provide a path forward to correct known significant deficiencies and achieve compliance with applicable national consensus codes and DOE Order 420.1C, *Facility Safety*; clarify that ASME NQA-1 requirements apply to defense-in-depth systems such as fire protection and ventilation; and consider elevating controls that provide event detection (i.e., continuous air monitors) to defense-in-depth.

Continuous Improvement: During the past three years, LANL has experienced two near-miss events where workers without appropriate controls entered rooms with low oxygen alarms actively sounding. Both events were the subject of DOE Office of Enforcement investigations. Recent data indicate that recent corrective actions taken by Triad have been effective so far. For example, the LANL emergency response organization has been contacted to respond to low-oxygen alarms about 22 times in the past three months compared to a previous history of essentially zero.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 21, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 21, 2020

Federal Oversight: On Wednesday, the EM Field Office issued their first staffing plan for Facility Representatives. They identified the need for four Facility Representatives and an additional supervisor. They currently have one newly hired individual undergoing qualification and two technical support contractors (see 11/29/2019 report). The most recent staffing plan for the NNSA Field Office identifies the need for a 15 member Facility Representative team with six vacancies. Many of NNSA's Facility Representatives are undergoing qualification resulting in key facilities that lack fully qualified coverage. For example, the Plutonium Facility has had only approximately four months where a fully qualified Facility Representative was present since November 2018.

Radiological Laboratory Utility Office Building: Last Friday, the NNSA Field Office sent a letter to Triad concerning deficiencies in the fire barriers, fire penetration seals, fire doors, and fire sprinkler restraints in the building. They noted that Triad identified the initial deficiencies as impairments on September 9, 2019, and that the full extent of condition remains unknown without an agreed upon schedule for completion. The field office directed Triad to: (1) submit an extent of condition report for all fire deficiencies by February 28, 2020; (2) submit for concurrence a prioritized strategy for dispositioning the deficiencies by March 20, 2020; and (3) provide a justification for why the building is safe to operate considering all fire deficiencies and the potential for similar construction deficiencies in other functional areas by March 20, 2020.

Plutonium Facility–Work Planning and Control: Last Wednesday, during performance of the weekly surveillance on the safety class firewater pumps, operations personnel observed that the level of fuel in the diesel day tank failed to meet the specified minimum. They took appropriate actions and restored the system. At the fact-finding conducted this Wednesday, participants determined that the likely cause of the condition was that a fuel sample had been taken the previous week as part of enhanced monitoring of the pumps (see 1/31/2020 report). The work authorizing document used to perform the sampling was a “Quick Fix” and did not provide important work steps such as replacing the volume of sampled fuel. Fact-finding participants determined that other work documents are available to support future sampling; however, they did not explore how the work control process allowed a “Quick Fix” to be used on safety class equipment, which is not authorized.

Emergency Management: On Wednesday Triad and N3B personnel conducted an emergency exercise. A five member team from DOE's Office of Enterprise Assessments was on site to evaluate the exercise. The scenario occurred in Area G and involved a truck hauling transuranic waste containers that crashed into a transuranic waste storage dome resulting in a pool fire. Triad personnel completed the formal critique and are evaluating exercise performance. During the critique, participants noted that miscommunications resulted in the Emergency Operations Center issuing inappropriate protective actions at Area G. A separate issue resulted in incorrect protective action recommendations for offsite communities.

Flanged Tritium Waste Containers (FTWC): Last Friday, Triad personnel took operational control from N3B of the sheds within Area G that house the FTWCs. Control will revert back to N3B, once the FTWCs are vented and moved to the Weapons Engineering Tritium Facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 28, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 28, 2020

DNFSB Staff Activity: P. J. Migliorini supplemented the onsite staff. His activities included walk-downs of the Plutonium Facility and Area G, as well as observation of the management review board held by the Associate Laboratory Director for Weapons Production.

Emergency Management: Last Wednesday, there was a small fire in a non-radiological laboratory at the Technical Area 48 Radiochemistry Facility. A researcher working in a fume hood added an organic solvent to flasks that contained a water reactive reagent when the solvent ignited, flame traveled back to the solvent bottle, and the researcher dropped the flaming bottle on the floor. Due to confusion regarding proper operation of an approved fire extinguisher, another researcher extinguished the fire using liquid nitrogen. The researchers notified their programmatic line management, but nobody notified the fire department or the Emergency Operations Support Center (EOSC). Facility management became aware of the situation the next morning and subsequently called the EOSC. Due to concerns regarding this event, Triad management debuted their new process for rapid sharing of information. This Wednesday, Triad issued an Immediate Lessons Learned that noted the following three items: (1) If there is any fire, even if it is extinguished, the Los Alamos Fire Department must be called; (2) Anytime there is an abnormal event, the EOSC must be called; and (3) Liquid nitrogen is not an approved fire extinguisher. Individuals not properly reporting events to the fire department and the EOSC has been a recurring issue at the laboratory (see 5/12/2017 and 2/9/2018 reports). The EOSC launched a new, mnemonic phone number in May 2019. The launch included training and provided a multitude of reminder paraphernalia across the laboratory.

Flanged Tritium Waste Containers (FTWC): On Thursday, Triad and N3B personnel conducted an emergency drill at the shed in Area G containing the FTWCs. The scenario involved an explosive pressure release during FTWC venting that knocked one worker over badly injuring an arm and dazed two other workers. All three casualties were potentially tritium contaminated. This training drill was the first conducted in Triad's new operational control area within Area G, and it demonstrated many areas where coordination between the two contractors and responders will need to improve. Of particular note, the EOSC improperly directed personnel to shelter-in-place in a damaged fabric waste storage dome—repeating the same error that occurred during last week's exercise (see 2/21/2020 report).

Technical Area 18–Legacy Materials: In early February 2020, a radiological control technician identified legacy radioactive materials stored outside in Technical Area 18, the former home to the Critical Experiments Facility. The problematic radioactive material is in a 5 gallon plastic bucket containing various bagged and wrapped objects. Radioassay measurements detected isotopes of curium, americium, and californium. On Monday, Triad personnel discovered that these materials had been identified for disposal in 2016. Consequently, they initiated an evaluation of breakdowns in the waste management process. Triad personnel overpacked the bucket in a metal drum and are evaluating whether the known information on this material is sufficient for waste disposal or whether additional characterization, likely at the Chemistry and Metallurgy Research Building, will be needed.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 6, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 6, 2020

DNFSB Staff Activity: On Tuesday, R.C. Eul, P.J. Migliorini, and A.J. Miller conducted a teleconference with NNSA Field Office personnel to understand the basis for their rating of Triad in DOE's Annual Metrics Report to the DNFSB on Nuclear Criticality Safety Programs.

Area G: On Monday, N3B responded to EM Field Office contracting direction issued on February 21, 2020, to implement compensatory measures and take actions concerning the safe storage of high fissile gram equivalent (FGE) containers in Dome 49. In their letter, the field office expressed concerns that documentation may not accurately reflect the number, as-found configuration, and safety controls associated with high FGE containers. N3B's response provided a listing of all high FGE containers and indicated the containers had been stored in accordance with approved criticality safety controls and operating procedures. N3B noted that the number of high FGE containers had changed since mid-2019 as a result of their initiative to implement criticality safety controls based on the measured FGE content plus two times the uncertainty, as a best management practice. In our opinion, it appears that better communications could have avoided this exchange.

Transuranic Waste Management: On Wednesday, Plutonium Facility personnel conducted a fact-finding to learn from two issues encountered during a shipment last month of containers to the Transuranic Waste Facility. The first issue concerned the fact that a container that was prohibited from being shipped made it to a payload; fortunately, an attentive worker observed a physical hold tag and prevented the shipment. The second issue involved a container that was not physically moved as part of the shipment, but had been transferred to TWF in the electronic inventory. Both issues occurred despite numerous procedural and software checks involving multiple groups of workers. As a result, management decided to conduct a human performance review of waste container handling processes.

Plutonium Facility—Operations: Last month, workers encountered two anomalies while oxidizing legacy plutonium items from the vault along with cans of sweepings. Historical data on these items suggested they were already oxidized; however, the furnace run was planned for additional assurance that the material was stabilized. During the furnace run, an unexpected thermal excursion occurred resulting in a cracked crucible and damaged thermocouples. The contact dose rate of the product also unexpectedly increased from approximately 1.5 rem/hour to approximately 2 rem/hour. The high radiation levels required the workers to split the product into smaller batches to meet storage requirements; however, they were unable to complete this task due to frequent alarms on their electronic dosimeters. An expedited reading of the worker's dosimeter showed an unexpectedly high dose for February. At a fact-finding to learn from the radiation exposure, facility management identified the need to evaluate: blending plans for processing run; compliance with the radiological work permit for removing materials from the vault, and a path forward to complete packaging of this material. Given the similarity to a previous excursion that spread fine black powder inside a glovebox in the same room (see 7/19/2019 report), Triad management requested a causal analysis of the events.

Federal Oversight: On Monday, Mr. Thomas Johnson Jr. became acting manager of the EM Field Office. On Wednesday, the EM Field Office issued their first formal transmittal of oversight surveillance reports to N3B for resolution in the issues management process. The field office continues to work through challenges and achieve compliance with their oversight command media.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 13, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 13, 2020

Emergency Management: On Monday, Triad activated the emergency operations center in a monitoring mode capacity to support COVID-19 preparedness activities, including refinements on minimal essential staffing plans. Laboratory personnel are actively working to address the State of New Mexico's public health order prohibiting gatherings of more than 100 people and the closure of all public schools for at least three weeks.

Plutonium Facility–Emergency Management: On Monday evening, workers in the basement reported a smoky haze to the operations center. Facility operators directed them to the other half of the facility, visualized smoke using video cameras, pulled a fire alarm, and made proper emergency notifications. In parallel, an engineering manager, who was in the operations center, entered the basement to assess the source of the smoke. He noted that there were no continuous air monitor (CAM) alarms and was aware of a programmatic vacuum pump that was being operated in a compromised condition to support a programmatic need. He quickly identified a failed plastic tubing line on the pump that was releasing aerosolized oil, de-energized the pump at the local disconnect, and departed the facility to meet the fire department. Fire fighters entered the basement in full protective gear with self-contained breathing apparatus and confirmed the situation was safe. Of note, the engineering manager indicated that he would not have entered the basement had a smoke detector alarmed or he smelled smoke; however, the smoke detectors in the basement are limited to certain enclosed areas and do not provide broad coverage of the basement. Phase III of the TA-55 Reinvestment Project includes scope to remedy this gap in coverage.

Plutonium Facility–Glovebox Safety: On Wednesday, facility personnel conducted a fact-finding on a recent glove breach on a plutonium-238 processing glovebox that significantly contaminated (about 300k dpm alpha) an operator's modesty clothing and alarmed a CAM. Participants surmised that the operator did not fully survey all areas of his coveralls that had potentially contacted the glovebox exterior which resulted in him carrying the contamination to another work area adjacent to the CAM. Triad management has observed that incomplete contamination surveys has been a recurring problem and is developing improved training and assessing placement of additional personnel contamination detectors throughout the facility.

Another important aspect of this event is the location of the glove breach. The location is similar to a breach that occurred last month. That breach was traced to a batch of gloves where Triad personnel observed multiple defects. Subsequent to this latest breach, management took action to promptly assess the installed population for gloves from this batch and either replace or thoroughly inspect the glove prior to use. Corrective actions from the previous event to evaluate opportunities to strengthen inspection processes, including as part of installation, remain underway.

Federal Oversight: On Wednesday, EM Field Office personnel were provided training on oversight surveillance report preparation and the use of the issues management system. The training comes after quality assurance support personnel noted problems encountered during preparation of last month's formal surveillance report transmittal (see 3/6/2020 report). EM Field Office personnel were also recently provided refresher training on stop/pause work after confusion arose during a field demonstration.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 20, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending March 20, 2020

COVID-19 Impacts: Triad's emergency operations center remains in monitoring mode with its pandemic advisory team meeting regularly to address the rapidly evolving situation. Overall, Triad is encouraging use of telework as a default if permitted by job function. Currently, about a third of the workforce is teleworking. Operations in the nuclear facilities remain ongoing with social distancing and enhanced disinfection protocols in use. N3B is also promoting telework while normal operations continue at Area G. Both the NNSA and EM Field Offices workforces have transitioned to largely teleworking with some physical presence of Facility Representatives and management. Known impacts of interest include:

- Triad has postponed readiness reviews for the venting and disposition of the Flanged Tritium Waste Containers. However, they continue to complete management self-assessment activities and conduct operational training.
- N3B has postponed its management self-assessment for retrieval of the corrugated metal pipes.
- The Waste Isolation Pilot Plant (WIPP) cancelled a planned shipment from the RANT Shipping Facility this week. Triad has payload containers staged and hopes to execute the shipment next week.

Transuranic Waste Facility: On Monday, the NNSA Field Office unconditionally approved Triad's evaluation of the safety of the situation (ESS) regarding the impacts of temporarily blocking waste container vents with a spatula-like tool (see 2/14/2020 report). On a related note, Triad waste management personnel have taken an action to evaluate safety basis controls for consistency across Triad's facilities that generate or store transuranic waste. On Tuesday, Triad submitted a safety basis revision to the NNSA Field Office for approval. The revision is needed to support use of the Mobile In-Situ Object Counting System Large Container Counter (MILCC). The MILCC is used to support non-destructive assay measurements for WIPP certification. Triad intends to relocate the MILCC from an outdoor pad at the Plutonium Facility.

Area G–Safety Basis: On Thursday, N3B and EM Field Office personnel conducted a teleconference to discuss proposed revisions to the safety basis strategy for the safety basis upgrade effort (see 10/18/2019 report). Notably, N3B is considering substantially more new analysis than anticipated, including a new hazards analysis, dispersion modeling, fire modeling, and an accident analysis using DOE-HDBK-1224-2018, *Hazard and Accident Analysis Handbook*. They are also proposing adopting elements of the draft revision of DOE-STD-5506, *Preparation of Safety Basis Documents for Transuranic Waste Facilities*. However, the overall document is still planned to be developed in accordance with DOE-STD-3011-2002, *Guidance for Preparation of Basis of Interim Operation (BIO) Documents*. The resident inspector questioned whether development to DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis* now, rather than in a subsequent future upgrade, is advantageous given the increased amount of new analysis. N3B expects to submit a finalized strategy for approval in the coming weeks.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 27, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending March 27, 2020

COVID-19 Impacts: Triad's Emergency Operations Center remains in monitoring mode with its pandemic advisory team meeting as needed. On Tuesday, emergency management personnel largely transitioned to virtual operations to reduce personnel in the Emergency Operations Center. Overall, about three quarters of Triad personnel are now teleworking. Nuclear facilities began reducing operations this week.

- The Weapons Engineering Tritium Facility and Chemistry and Metallurgy Research building transitioned to minimal operations. Both facilities are maintaining reduced staff for limited days to perform surveillances and other required activities.
- Transuranic waste operations at the Transuranic Waste Facility, the Plutonium Facility, and the RANT Shipping Facility remain active. Activities include non-destructive assay and flammable gas headspace measurements in support of certification for the Waste Isolation Pilot Plant (WIPP), as well as preparation of payloads for possible continued shipments to WIPP. A shipment of drums departed RANT for WIPP on Tuesday.
- The Plutonium Facility has reduced programmatic activities with additional social distancing and cleaning protocols in place. Maintenance and some construction activities are also continuing.
- Area G operations transitioned to near minimal on Thursday. N3B personnel will be completing all required daily and weekly rounds for safety and environmental compliance. Equipment maintenance activities will also continue.
- The EM and NNSA Field Offices are nearly exclusively teleworking. NNSA has begun planning for resumption of operations once warranted by conditions.

Radiological Laboratory Utility Office Building: Two weeks ago, Triad responded to the NNSA Field Office's request for a prioritized strategy for resolution of the fire protection deficiencies in the building (see 2/21/2020 report). The strategy provides options for physical remedies as well as administrative variances and permanent exemptions. Triad emphasized that the most important element is to repair the five stairwells in the facility to meet occupant life-safety code—an effort currently expected to take at least another year. Triad's proposed prioritization of the other deficiencies include: (1) restore occupant life-safety impacted fire barriers as much as feasible; (2) provide compliant and reliable operations for the fire suppression system; (3) address property protection requirements; (4) address other code compliance issues; and (5) address lower priority deficiencies in the central utility building. Triad estimated overall completion of the effort to require four to five years depending on funding sources and profiles.

Transuranic Waste–Readiness: Last Friday, the NNSA Field Office approved Triad's request to credit activities at the RANT Shipping Facility to forgo a formal readiness review for mobile loading of transuranic waste at TA-55 (see 12/13/2019 report).

Area G–Safety Basis: Last Thursday, N3B transmitted to the EM Field Office for approval its evaluation of the safety of the situation concerning discrepancies in waste container aisle spacing (see 1/10/2020 report). N3B performed calculations for pool fuel fires demonstrating that the potential consequences from the as-found configuration do not change the currently accepted risk profile.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 3, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plau and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 3, 2020

COVID-19 Impacts: The laboratory's operational posture remains similar to the end of last week (see 3/27/2020 report). Developments this week include:

- On Tuesday, the NNSA Field Office approved Triad's request for a 90-day extension for training required by DOE Order 426.2, *Personnel Selection, Training, Qualification, and Certification for DOE Nuclear Facilities*, because of social distancing impacts on the ability to conduct required courses.
- The NNSA Field Office is coordinating with DOE Headquarters on the need for other regulatory relief.
- Triad generated and distributed a video tailored towards craft workers discussing COVID-19 transmission, occupational risks, and best practices to minimize fomite spread and infection.
- On Thursday, Triad completed a shipment of waste to the Waste Isolation Pilot Plant.

Federal Oversight: In 2018, the NNSA and EM Field Offices both revised their processes for line management oversight and independent assessment activities of their contractors. Both offices experienced challenges implementing these processes in fiscal year 2019 and are working on improvements. For example, the EM Field Office completed 1 out of about 7 planned assessments of N3B functions related to safety at the nuclear facilities. Similarly, the NNSA Field Office completed 1 out of about 6 planned assessments of Triad functions related to safety at the nuclear facilities—the balance were either cancelled or delayed into this fiscal year. Notably, overall execution varied substantially between organizations. For example, the Quality Assurance organization completed 10 of 13 planned independent assessments mainly related to product acceptance, while the Field Operations organization did not complete any of its 3 planned independent assessments—2 were cancelled and one was actually executed as a shadow assessment.

Both offices were also challenged with their line management oversight. The data for the NNSA Field Office indicate that 20 people identified issues out of a staff of about 85; however, just 6 people were responsible for about 75 percent of the entries in the formal issues management system. Further review indicates that most issues have been dispositioned in a manner directed by senior management (typically email or verbal), rather than capturing in a contracting letter requesting formal resolution. While procedure allows this process for low risk issues, the lack of formality increases the difficulty for tracking, trending, and effectiveness reviews. Until recently, the EM Field Office had not been maintaining the results of its line management oversight in a systematic manner (see 3/6/2020 report). As a result, the resident inspectors cannot find credible data from last year to assess their federal oversight.

Last month, the NNSA Field Office completed an independent assessment of their Integrated Safety Management program and their oversight of the contractor's program. Notable results include: a finding that field office procedures have been chronically out-of-date and not reviewed per requirements; an observation that the field office has not completed a staffing evaluation; and a noteworthy practice regarding the effectiveness of the laboratory's Integrated Safety Management System Steering Committee.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 10, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending April 10, 2020

COVID-19 Impacts: The laboratory's operational posture remains similar to the end of last week. Developments this week include:

- Plutonium Facility leadership issued a policy describing the requirements for ramping up work, including additional specifics regarding occupancy limits in laboratory rooms and a process for subject matter expert review of activities where adequate spacing cannot be maintained.
- N3B and Triad provided guidance for wearing face coverings in facilities.
- Triad personnel completed two shipments to the Waste Isolation Pilot Plant (WIPP). Further shipments are on hold as WIPP management paused shipments for the next two weeks.
- N3B and Triad have implemented extensive remote learning programs offering lectures on topics such as criticality safety, conduct of operations, and plutonium metallurgy.

Area G–Safety Basis: On Thursday, the EM Field Office transmitted to N3B comments to be addressed regarding the draft safety basis in development for Area G (see 10/18/2019 and 3/20/2020 reports). The comments cover chapters 1 and 2 of the document with the most detailed comments related to the use and implementation of vehicle barriers protecting defined areas (locations specified within the safety basis as requiring controls to carry out process and storage activities). The field office comments propose more consistency and improved linkage of the safety basis and implementing procedures. Determining compliance with this control has been challenging (see 10/12/2018 report).

Transuranic Waste Management: Last week, the NNSA Field Office sent a letter to the Carlsbad Field Office requesting two revisions to the Basis of Knowledge (BoK), including: (1) accepting polysaccharides (e.g., cheesecloth) that have contacted nitric acid in concentrations of less than 12 molar and (2) broadly indicating that nitric acid at concentrations of less than 12 molar is not an oxidizer. DOE generated the BoK as part of a strengthened waste acceptance criteria for WIPP as a corrective action from the 2014 radiological release event. Specifically, DOE uses the BoK to screen for potential oxidizers in waste materials that could result in chemical exothermic reactions and propagating fires. As support for this request, Triad submitted testing results that indicate cheesecloth exposed to less than 12 molar nitric acid does not meet the UN Division 5.1 definition of a solid oxidizer. Triad also cited the Department of Transportation's oxidizer criterion for nitric acid of greater than 14.3 molar nitric acid. The resident inspectors note that application of these results should be treated cautiously, as pristine combinations of nitric acid and polysaccharide absorbents are unlikely to be found in nuclear process environments. Instead, metals are often present that form metal nitrate salts during evaporation resulting in complicated chemistries that can create materials that possess the EPA hazardous waste characteristic of ignitability (D001). For example, other LANL investigators found cheesecloth could not be sufficiently rinsed with water to remove the oxidizer property imparted through contact with five weight percent potassium nitrite (LA-UR-17-23809) and that cellulosic wipes contacted with nitrate salt surrogate solutions were ignitable (LA-UR-16-24408).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 17, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending April 17, 2020

COVID-19 Impacts: Staffing levels and work activities remain similar to last week. Developments this week include:

- Two Triad affiliated workers tested positive. They are associated with construction projects that have continued as part of reduced operations. The laboratory total is now four, including two N3B affiliated workers that tested positive earlier this month.
- In anticipation of increasing programmatic operations in the coming weeks, Plutonium Facility management conducted training on COVID-19 related safe work practices. Additionally, they began performing procedure reviews to determine whether processes can be performed while maintaining six feet of standoff between work crew members. They plan to implement additional mitigation measures for those actions that cannot meet this requirement.
- Triad personnel continued transuranic waste characterization and movement activities. They completed two shipments of waste from the Plutonium Facility to the Transuranic Waste Facility.

Plutonium Facility–Safety Basis: Late last month, Triad safety basis personnel noted that material-at-risk (MAR) tracking software applied a damage ratio of less than unity for credited containers that are nested within non-credited containers. They conservatively concluded that the actual damage ratio of a nested container configuration is unanalyzed. Analysts recalculated the MAR in the basement without applying a damage ratio for nested configurations and determined that they are approaching the limit. Last Friday, Triad submitted a safety basis change to the NNSA Field Office requesting a two-fold increase in the limit for basement waste MAR. Their technical justification for this increase states that doubling the basement MAR increases the mitigated consequences for the bounding accident from 3.0 to 3.3 rem to the public. Longer term, Triad plans to evaluate an appropriate net damage ratio for nested containers.

Federal Oversight: On Wednesday, NNSA Field Office management conducted a telephonic oral board for an emergency management specialist. The candidate passed the examination, which was executed well under the remote-work conditions. The NNSA Field Office is currently staffed with two emergency management specialists.

Continuous Improvement: Since November 2018, Plutonium Facility management has requested 50 causal analyses, including 42 during the first twelve months of operation, for events that procedures would not have required performance of a causal analysis. For comparison, the predecessor contractor requested eight non-mandatory analyses during their last year of operation. To enable this analysis workload, Plutonium Facility management increased the number of its causal analysts from one to five. They recently completed two reviews of the causal program. The first review initiated a periodic examination for trends and common causes, but found there was not yet sufficient data to draw defensible conclusions. The second review examined eight completed causal reports and found that only about 55 percent of the recommendations were being tracked to closure in the issues management system. Plutonium Facility management is developing an issues management improvement plan to strengthen several processes, including better integration of the causal analysis process with the issues management system. The resident inspectors note that the effectiveness of the program could be strengthened by formalizing some existing practices into a procedure covering the lifecycle of the causal process.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 24, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 24, 2020

COVID-19 Impacts: Staffing levels and work activities remain similar to last week.

Developments this week include:

- Triad management continued development of COVID-19 related institutional command media and tabletop reviews of programmatic activities in the Plutonium Facility in anticipation of increasing operations.
- Triad personnel continued transuranic waste characterization and movement activities. They completed a shipment of waste from the Plutonium Facility to the Transuranic Waste Facility on Tuesday. On Thursday, they completed a subsequent shipment from the Transuranic Waste Facility to the RANT Shipping Facility in preparation of resuming shipments to the Waste Isolation Pilot Plant.

Plutonium Facility–Fire Protection: On Monday, Triad personnel completed an implementation verification review for safety basis changes associated with new diesel backup generators for the electric fire-water pumps (see 1/31/2020 report). There were no findings from the review. The generators now provide credited backup power to the pumps, which allows for additional operations flexibility. This is because required actions now only need to be taken when both a diesel fire water pump and an electric pump or its associated backup generator are inoperable. Prior to installation of the generators, the actions were required when only the diesel fire water pump was inoperable.

Federal Oversight: Last Friday, the NNSA Field Office issued an independent assessment report from their review of Triad’s Emergency Management Program. The review was conducted last August and September and used new criteria and review approach documents developed using guidance from the DOE/NNSA Office of Emergency Operations and Policy. The review identified one finding related to radiological control technician adherence to contamination control protocols at the hospital.

Readiness: On Thursday, N3B personnel telephonically convened their Joint Evaluation Team to review the proposed level of readiness review for the size reduction of the Corrugated Metal Pipes. N3B plans to install a manual roller conveyer and a diesel-powered hydraulic shear at the Dome 375 Permacon to enable movement of the pipes to be cut into sections appropriate to fit into a Standard Waste Box. After limited discussion, the team approved a recommendation for contractor and federal readiness assessments to be conducted in parallel in consideration of the COVID-19 circumstances. N3B will be submitting their proposal to the EM Field Office for approval.

On Tuesday, Triad sent their startup notification report for the third quarter to the NNSA Field Office for approval. Restart of aqueous nitrate operations is on hold for the calendar year; the projected startup of the venting of the Flanged Tritium Waste Containers at Area G is now summer 2020; and the projected startup of the Radiological Laboratory Utility Office Building as a hazard category 3 nuclear facility is July 2021.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 1, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 1, 2020

COVID-19 Impacts: Developments this week include:

- The Emergency Operation Center demobilized on Thursday from the monitoring mode they entered on March 9. COVID-19 coordination tasks will now be performed by Emergency Management Division personnel as part of their normal duties.
- The LANL Director conducted an all-managers virtual online meeting on Thursday to introduce a new institutional policy for COVID-19 risk and control measures for onsite work. The policy establishes controls for increased onsite work; however, the policy does not include prerequisite conditions or a schedule for resuming increased onsite work.
- Plutonium Facility personnel resumed additional mission critical manufacturing activities that had been paused for a regularly scheduled inventory of nuclear material.
- Chemistry and Metallurgy Research building personnel continued their second week of resumed operations in support of plutonium manufacturing.
- Triad personnel continued transuranic waste characterization and movement activities. They completed two shipments from the RANT Shipping Facility to the Waste Isolation Pilot Plant.
- N3B issued a standing order on Monday that defines COVID-19 expectations for performance of ongoing onsite activities.

Plutonium Facility–Training: During this period of reduced operations, Plutonium Facility personnel have continued to conduct oral review boards for a new “working person-in-charge” qualification. The board examines candidates on a variety of principals and policies associated with integrated work management and conduct of operations. Triad management has been adjusting practices and policies associated with the person-in-charge role in response to several abnormal events (see 3/22/2019, 4/19/2019, 12/6/2019 reports). On Thursday, a resident inspector observed one of the new boards and noted adequate conduct, including implementation of social distancing, and good performance by the candidate.

Weapons Engineering Tritium Facility: Last Saturday, the facility experienced a total loss of electrical power and facility personnel were unable to use the backup generator due to the location of the fault and equipment problems. The safety basis does not credit these systems; however, loss of power triggers certain required actions to be taken. In anticipation of an extended outage, operators took the safety basis required actions and reduced the facility mode to warm standby. On call linemen arrived, determined the issue to be a phase to phase arcing in a substation transformer primary, possibly due to an insect, and restored normal power to the facility. Facility personnel have been deliberately restoring systems during the course of the week. On Monday, they held a telephonic fact-finding to review the event. Overall, they noted an excellent off-hours response despite the COVID-19 situation. They also identified a repeat issue with the backup generator that would not have prevented this outage and the need to develop a procedure to facilitate use of a portable generator.

Management: On Thursday, Triad management announced changes to organizational reporting and personnel that transfers divisional accountability for transuranic waste management activities within the Weapons Production directorate to the Senior Director of Environment and Waste Programs.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 8, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 8, 2020

COVID-19 Impacts: Developments this week include:

- Triad rolled out mandatory training for onsite work based on its new institutional policy.
- Plutonium Facility personnel continued to resume additional mission critical manufacturing activities that had been paused for a regularly scheduled inventory of nuclear material.
- Triad personnel continued transuranic waste characterization and movement activities. They completed two shipments from the RANT Shipping Facility to the Waste Isolation Pilot Plant.

Safety Basis: On Monday, the NNSA Field Office formally transmitted its review comments on Triad's revised Unreviewed Safety Question (USQ) procedure, which was submitted for approval in January. The field office requested a revised procedure incorporating necessary comments and official responses for any that remain unresolved. Comments from the field office included concerns regarding exclusions of certain types of documents, drawings, and activities from the USQ review; linkage of the USQ process with the New Information/Initial Confirmatory process; and a lack of timeliness requirements for preparation of Evaluation of the Safety of the Situation documents.

Plutonium Facility–Safety Basis: On Monday, the NNSA Field Office unconditionally approved the safety basis change associated with increased material-at-risk in the basement (see 4/17/2020 report).

Fire Protection: Arid, windy conditions drove the regional fire danger risk to its highest level, extreme, on Thursday. COVID-19 has not significantly impacted Triad's wildland fire mitigation team's vegetation control efforts. N3B personnel are also continuing with fuel mitigation efforts within Area G.

Transuranic Waste Management: Triad and N3B personnel continue to establish processes and procedures to enable the use of the RANT Shipping Facility for the EM owned waste stored at Area G. Eventual achievement of this capability will represent a positive step toward risk reduction for the overall laboratory, particularly since the waste at Area G is the least well protected and mobile loading operations are highly weather constrained. So far this fiscal year, Triad has been able to complete 15 shipments to the Waste Isolation Pilot Plant, while N3B has completed just one.

Area G: On Wednesday, N3B personnel held a teleconference with EM Field Office and Headquarters personnel to discuss their proposal to conduct an upcoming contractor and federal readiness assessment in parallel for size reduction of corrugated metal pipes. No decision was reached, but they agreed to research historical EM direction that prohibited such a parallel approach and conduct a more thorough analysis of the benefits and disadvantages for this and future readiness assessments. N3B managers also noted that in order to utilize the parallel approach, they need field office approval of the revised readiness process procedure that was submitted in November 2019.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 15, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plae and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending May 15, 2020

COVID-19 Impacts: The nuclear facilities continue with routine entry into their normal operation modes as defined in their safety bases to support programmatic work. Developments this week include:

- Positive cases at the laboratory are now at 11, including an individual confirmed this week that recently performed duties at the Plutonium Facility.
- Triad personnel completed a pilot effort for drive-up COVID-19 specimen collection and onsite analysis. They tested 49 priority workers (e.g., first responders, medical staff, and mission essential personnel) and plan to ramp up mandatory, random testing from such priority work groups in the coming weeks pending the availability of collection supplies. They are also experimenting with an alternative approach for self-collection of saliva that could substantially increase the number of weekly onsite tests.
- Triad personnel continued transuranic waste characterization and movement activities. They completed two shipments from the RANT Shipping Facility to the Waste Isolation Pilot Plant. They also relocated non-destructive assay equipment to the Transuranic Waste Facility and plan to begin certified measurements next week.

Safety Basis: Subsequent to a discussion with the NNSA Field Office, Triad safety basis personnel entered their New Information process on Wednesday to evaluate whether the safety basis appropriately considers hazards from an aluminum-skinned plywood trailer parked adjacent to transuranic waste containers. The trailer has an interior consisting of substantial wooden shelving used to store combustible supplies. Plutonium Facility management also engaged fire protection engineers to evaluate this condition. On Tuesday, Triad safety basis personnel entered the New Information process to evaluate whether the collapse of the canopy area at the RANT Shipping Facility is analyzed to impact transuranic waste containers.

Federal Oversight: On Wednesday, the NNSA Field Office closed the final three issues from the last biennial review conducted by NNSA's Chief of Defense Nuclear Safety (see 3/17/2017 report). Overall, they addressed 178 individual issues through the execution of 378 corrective actions. The next biennial review of the field office was planned for last month, but has been delayed due to the pandemic.

Plutonium Facility–Operations: Last Thursday, a worker dropped a container of nuclear material while passing it between gloveboxes on his fingers resulting in a bone fracture. There was no glove breach. The manual transfer was needed because the engineered material transfer system supporting these boxes is out of service. Facility management is evaluating guidance on how to manually move heavy containers in gloveboxes. They also added a note in the shift orders reminding personnel to ensure all required notifications are made for injuries, since that did not occur with this event.

Plutonium Facility–Construction Safety: Last Tuesday, an excavation subcontractor struck an electrical conduit while working on the Construction Support Facility, which is located adjacent to an outdoor waste storage pad. The subcontractor's excavation exceeded the boundary of where utility potholing had been performed. Workers immediately paused work and excavation activities remain paused for this project. Triad personnel later verified that the conduit was de-energized and believe it to be abandoned from a past security infrastructure upgrade project.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 22, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 22, 2020

COVID-19 Impacts: The nuclear facilities continue with routine entry into their normal operation modes as defined in their safety bases to support programmatic work. Triad implemented new controls for onsite work including mandatory use of face coverings in common areas and random testing of priority worker populations (e.g., first responders, mission essential staff, and positions that require high social contact). Triad personnel continued transuranic waste characterization and movement activities. They completed two shipments from the RANT Shipping Facility to the Waste Isolation Pilot Plant.

Plutonium Facility–Operations: Last week, facility personnel opened a shipping cask containing plutonium heat source material received from the Idaho National Laboratory in 2016. On Wednesday, facility personnel noted that the SAVY container, which was the credited barrier in the configuration, from the cask contained more units than allowed by an associated specific administrative control that protects the thermal limit for the SAVY. Accordingly, facility management declared a violation of the Technical Safety Requirements. At the fact-finding, involved personnel noted that there were gaps between the implementation matrix for the approved safety basis and the procedures used to perform this activity consistent with the applicable specific administrative control (see 12/20/2019 report). Triad personnel plan to perform a formal causal analysis on this event and evaluate the procedures used for this activity. The heat source material has been introduced into a glovebox and no longer relies on its container.

The Resident Inspectors walked down the facility on Thursday. Observations include:

- Workers were actively reducing the number of process residue containers that have been accumulating in the floor storage area of a processing room (see 6/28/2019 report). There are now about 90 containers in the location and the workers have implemented a tracking grid to facilitate easier management.
- The majority of rooms have occupancy limits posted at entrances in a standardized location used to alert workers for room-specific conditions. As a best practice, one room with a high work tempo had a small whiteboard on the door to track occupants. Notably, facility management established occupancy limits that accommodate federal oversight personnel.
- Workers inside the facility were generally adhering to COVID-19 controls and expressed confidence in those controls.
- Waste management personnel relocated the trailer loaded with combustibles further away from transuranic waste drums. Safety basis personnel continue to determine whether the previous location represents a potential inadequacy of the safety analysis.
- Senior Weapons Production managers were performing a facility walkdown.

Radiological Laboratory Utility Office Building: Last week, the NNSA Field Office provided minor adjustments, but overall concurred with Triad's strategy for addressing the fire protection deficiencies in the building (see 3/27/2020 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 29, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 29, 2020

COVID-19 Impacts: The nuclear facilities continue with routine entry into their normal operation modes as defined in their safety bases to support programmatic work. Triad personnel continue to incrementally increase onsite programmatic work at the Plutonium Facility, the Chemistry and Metallurgy Research building, and the Weapons Engineering Tritium Facility. They also continued transuranic waste characterization, movement, and shipping activities.

Flanged Tritium Waste Containers (FTWC): On Wednesday, Triad personnel performed a practice evolution in Technical Area 49 for venting of the FTWCs stored at Area G. Personnel worked through the entire procedure using a combination of mockups and actual equipment. The major activities include: installation of the vent rig, leak testing, initial venting, additional venting as needed, and movement of the FTWC from the shed to a truck using a remote-controlled skid-steer conveyance. They identified the need for changes to the venting procedure and other improvements to the process.

Plutonium Facility–Safety Basis: Last Friday, facility management declared a potential inadequacy of the safety analysis after analysts completed their review of the trailer loaded with combustibles parked in proximity to transuranic waste containers (see 5/15/2020 report). Safety analysts concluded that the as-found configuration was inaccurately reflected in the assumptions associated with the applicable hazard analysis event, which is a refueling accident. In particular, they noted that the presence of the trailer challenged the assumption in the event that the historically low amount of ordinary combustibles present in the location meant that the refueling accident bounds the frequency and consequences of an ordinary combustible fire. We note that there are more fundamental problems with the original event logic, as the controls for a liquid pool fire are different than an ordinary combustible fire. As a compensatory action, management had the trailer relocated further from the containers shortly after the question was raised.

Engineering: Last Friday, Triad management sent the NNSA Field Office a letter requesting review and approval of its ten year assessment plan for natural phenomena hazards (NPH). DOE Order 420.1 C, *Facility Safety*, requires each site to review its NPH assessment every ten years for any significant changes in data, criteria, and assessment methods that would warrant updates. Triad noted the predecessor contractor had completed such an assessment in 2014, but could find no evidence that the field office approved the plan as required. The 2014 plan notes that the primary NPH in need of an update based on the last analyses are seismic (2007); volcanic (2004); wind and wind borne missiles (2004); flood, precipitation, snow and ice cover (2004); and landslides (2004). The letter notes that subsequent analyses for wind and precipitation-related hazards were completed in 2015. However, the letter does not provide an update to the schedule for completing the remainder of the analyses—the schedule in the 2014 plan was incomplete for some analyses (e.g., volcanic) or has deadlines that have passed (e.g., seismic in September 2019). The letter commits to submitting the next ten year assessment plan by 2024. The NNSA Field Office has requested headquarters support to review the plan.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 5, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 5, 2020

COVID-19 Impacts: The nuclear facilities continue with routine entry into their normal operation modes as defined in their safety bases to support programmatic work. Current activities at the Plutonium Facility include casting, electrorefining, heat source plutonium processing, and elimination of production residues. Triad personnel also continued transuranic waste characterization, movement, and shipping activities with another two shipments completed from the RANT Shipping Facility. These shipments consisted of standard waste boxes with high fissile gram equivalent drums. This is the first shipment of standard waste boxes from the RANT Shipping Facility since its restart in 2019.

Plutonium Facility–Operations: Triad management recently initiated a formal second work shift focused primarily on equipment upgrades supporting pit manufacturing and completion of radiological control tasks. The second shift alleviates some COVID-19 challenges with co-located programmatic and installation work during the day shift. The NNSA Field Office has out-year plans for increased field staff to accommodate shift work and is developing a strategy for oversight in the interim.

Plutonium Facility–Emergency Management: Last Tuesday, workers bumped a glovebox thermal detector while erecting scaffolding resulting in a fire alarm and emergency response. On Monday, facility personnel conducted a fact-finding on this event. This was the third fire response resulting from inadvertent insults to fire protection equipment in 2020. Given the recurrence, fact-finding personnel determined the need to further assess construction type activities near fire devices. They also discussed discrepancies in the institutional reporting of the event that reflected a response to an adjacent administrative building rather than the nuclear facility.

Area G–Contractor Assurance: Last month, N3B closed out its corrective action associated with the technical safety requirement violation for multiple failures to complete vegetation inspections and cutbacks during wildland fire season, as well as maintain the records (see 12/20/2019 report). N3B management screened the issue as low significance in accordance with the DOE occurrence reporting system criteria, which then translated into a low significance categorization in the N3B issues management process. Of note, the N3B process does not preclude management from assigning a higher significance level and even suggests a moderate designation for compliance issues that impact safety. The benefits of a moderate or high significance level include additional rigor such as detailed causal analysis, management review board screenings, and effectiveness evaluations. In this case, as a low significance issue, the N3B responsible manager determined the corrective action to be a revision to the associated procedure. On Tuesday, the resident inspectors observed in-progress shrubbery mitigation and an overall improvement to the state of vegetation control compared to last month.

Federal Oversight: Two weeks ago, the NNSA Field Office issued its self-assessment of their Nuclear Maintenance Management Program. The report included one finding that field office personnel had not performed a comprehensive assessment of the contractor's maintenance management programs within the three year frequency in accordance with DOE Order 413.1B, *Maintenance Management Program for DOE Nuclear Facilities*. This issue was also contained in the 2017 biennial review by the Chief of Defense Nuclear Safety. Field office personnel have an oversight plan in place to complete the required assessment and resolve this issue.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 12, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 12, 2020

COVID-19 Impacts: On Monday, the NNSA and EM Field Offices, as well as N3B entered phase 1 of their resumption plans. Triad continues to perform essential functions and is gradually increasing onsite work in accordance with their institutional policy for COVID-19 controls.

Plutonium Facility–Glovebox Safety: On Monday, continuous air monitors sounded when an operator pulled out of the glovebox gloves after weighing and packaging plutonium-238 oxide powder. The worker received significant contamination on his protective clothing, hair, and skin, as well as positive nasal swabs indicating a potential intake. Radiation protection personnel successfully decontaminated the individual, and he was provided chelation therapy. The room experienced significant airborne radioactivity and was contaminated. Fourteen additional workers were placed on bioassay. On Thursday, Triad management conducted a fact-finding to discuss the event, response, and near-term actions. Given the significance of the event, they chartered a team to perform a comprehensive investigation.

Area G–Emergency Management: Last Saturday, high winds damaged an electrical pole near the operations center. The loss of power triggered trouble alarms from impacted fire panels. Upon responding, N3B personnel observed a smoking pole and damage to the electrical equipment so called Triad utilities personnel and the fire department. Following this initial response, N3B personnel noted an emergent brush fire adjacent to the pole which was promptly extinguished by the fire department. While the offshift response was prompt, communications for the brushfire did not reach all parties in a timely manner. Power was restored and the fire panels were back in service by the end of the week.

Transuranic Waste Management: On Monday, workers successfully changed the corroded filters found on seven waste containers first discovered last May (see 5/24/2019 and 9/6/2019 reports). The workers noted varying levels of corrosion, but no occlusion of the filter vent path. They are currently evaluating the need to replace a corroded filter on another container recently returned from the Transuranic Waste Facility. They are also working with the Carlsbad Field Office to determine whether any actions are necessary to prevent recurrence with this waste matrix.

Area G–Readiness: N3B and EM personnel decided to setup a routine standing meeting to discuss upcoming readiness activities. They realized that better attendance, to include EM Headquarters readiness personnel, is necessary to reduce the backlog of approvals needed for the slate of upcoming readiness reviews. For example, the EM Field Office has not acted on one of N3B's quarterly startup notification reports since April 2019. Similarly, N3B has been waiting for approval of its revised readiness process since November 2019.

Legacy Facilities: On Wednesday, EM Field Office personnel and N3B program management accompanied the resident inspectors on a walk-down of Technical Area 21. The focus of the walk-down was familiarization with planned decontamination and demolition of an old radioactive liquid waste treatment facility and associated industrial liquid waste lines that are radioactively contaminated. EM and N3B are currently assessing the impact of higher than expected results from a recent radiological characterization on the path forward for the removal of these structures.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 19, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 19, 2020

DNFSB Staff Activity: On Thursday, a DNFSB Headquarters staff team conducted a telephone conference with Triad and NNSA personnel to discuss the re-designation of the Radiological Laboratory Utility Office Building to a hazard category 3 nuclear facility to be termed PF-400. The discussion covered the safety and control strategy, as well as the current concerns related to the design and installation of key active support systems in the facility (see 3/27/2020 report).

Plutonium Facility–Accident Investigation: On Wednesday, Triad management issued a charter for a team to investigate last week’s airborne exposure of workers to heat source plutonium (see 6/12/2020 report). The team’s mandate includes: development of a comprehensive articulation of the facts and timeline; an assessment of glove surveillance and maintenance to include a review of the past two years of glove breaches; an assessment of the radiation protection and occupational health responses; an evaluation of the effectiveness of the corrective actions taken after the July 2018 puncture wound; and a causal analysis supported by a human performance evaluation to inform recommended corrective actions. The team includes several members from other sites and is expected to complete its work by July 17, 2020.

Chemistry and Metallurgy Research (CMR) Building: In late May, CMR personnel began flammable gas sampling on 9979 containers containing enriched uranium materials in preparation for shipment offsite to support risk reduction at the facility. Several of the containers had unexpectedly high hydrogen levels with one approaching the lower flammability limit. Safety basis personnel entered the New Information process to evaluate this condition. In 2018, a similar entry into the New Information process concluded that the safety analysis was adequate based on predicted hydrogen generation rates. Facility personnel plan to sample more of the 9979 containers in CMR and vent those with elevated readings. This process is awaiting an update to the criticality safety evaluation, which does not explicitly allow sampling or venting of these containers.

Transuranic Waste Facility (TWF)–Operations: Last Thursday, during flammable gas sampling activities, a worker noted that a filter on a transuranic waste drum was loose. The safety basis requires containers that have questionable integrity to be overpacked or the integrity restored within seven days of discovery. In this case, facility operators contacted the laboratory’s HAZMAT team and they overpacked the drum into an 85 gallon drum later the same day. TWF personnel only have the capability to overpack drums into standard waste boxes, and in this case they considered the 85 gallon drum overpack a better option. Last December when a worker found damage to the filter medium, one of the corrective actions was to evaluate adding capabilities for TWF personnel to overpack drums without relying on institutional HAZMAT personnel (see 12/20/2019 report). They concluded there was a need to develop that capability; however, the action to develop a procedure has been extended twice and is currently scheduled to be completed in September. After this event, TWF management took an action to evaluate the need for safety basis coverage and procedures to recover from other common off-normal conditions such as changing filters on waste containers.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 26, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 26, 2020

Plutonium Facility–Glovebox Safety: On Monday, Triad’s team investigation commenced in response to the heat source plutonium airborne release event (see 6/12/2020 report). This week, the team conducted interviews of the involved workers, radiological control technicians, procurement and training personnel, and line management. In parallel with the investigation, Triad management issued two standing orders defining interim compensatory measures for glovebox glove inspection and replacement criteria. The first standing order, issued last Thursday, was specific to heat source plutonium operations. On Monday, management issued the second standing order, which applies to all glovebox operations within the directorate. Key compensatory measures in both standing orders include: workers must inspect their gloves prior to exiting them, supervisors will review glovebox training with all workers, and the threshold for taking gloves out of service for issues found during inspection has been reduced.

Plutonium Facility–Radiological Safety: On Thursday, Triad management paused repack, consolidation, and discard operations of legacy nuclear materials after an event revealed inadequate radiological controls for a legacy item with high radiation levels. The event resulted in a worker receiving an unexpected level of radiation exposure. Next week, they plan to reconvene a fact-finding that partially completed on Wednesday.

Chemistry and Metallurgy Research Building: On Friday, Triad personnel concluded the discovery of elevated hydrogen levels in 9979 containers constituted a potential inadequacy of the safety analysis because these containers are not currently covered by existing flammable gas controls. Facility personnel started venting the elevated containers on Wednesday. Triad personnel are evaluating why some of the materials in these containers generated gas at a much higher rate than expected.

Weapons Engineering Tritium Facility: On Monday, Triad personnel shipped one Flanged Tritium Waste Container (FTWC) to the Nevada National Security Site. This shipment represents the first successful offsite disposal of a FTWC and the first FTWC disposed of in about a decade. This is one of the five FTWCs without a flammable gas hazard currently stored in the facility. Removing these FTWCs clears up needed floor space for receipt and processing of the FTWCs at Area G that need to be vented.

Federal Oversight: On Monday, Mr. Kirk Lachman assumed the position as manager of the EM Field Office. Also on Monday, a 15 person team from DOE’s Chief of Nuclear Safety commenced the desktop review phase of an audit on nuclear safety functions at the EM Field Office. This first phase focuses on the procedures and oversight actions related to nuclear safety oversight and nuclear readiness activities, as well as nuclear safety staffing resources. A subset of the team plans to perform a future second phase to include onsite interviews of federal and contractor staff, as well as targeted observations of operations and meetings in relevant functional areas. This is a pilot audit for a larger effort to be executed at other Environmental Management field elements.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 3, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 3, 2020

Plutonium Facility–Radiological Safety: On Tuesday, Triad personnel reconvened their fact-finding to better understand the unexpected radiation exposure during analysis of a legacy item (see 6/26/2020 report). The item in question originated in 1990 and was removed from the vault in 2018. In November 2019, chemistry personnel received a portion of the item. In December, they received the remaining pieces of the item into a glovebox without leaded gloves or shielded windows. Breakdowns in communications meant that chemistry personnel did not realize the item represented a significant gamma radiation exposure hazard (approximately 3 rad/hour on contact, 300 millirad/hour at 30 cm). Consequently, the chemistry personnel performed the analytical work on the item without using a radiological work permit or with supplemental dosimetry. This meant that management did not discover the elevated radiological exposure until after measurement of the worker's quarterly dosimeter. The item remains in the analytical chemistry box with temporary shielding until a recovery plan is completed. Repack, consolidation, and discard operations of legacy nuclear materials remain paused, and facility management is evaluating radiological controls for high dose items.

Plutonium Facility–Infrastructure: The cross-town trolley has been out of service since it ran into a closed damper door at the beginning of June. This trolley connects the trolleys that service each of the four laboratory area. As a consequence, intra-area trolley transfers have been hampered. The trolley bucket is stuck with a container of nuclear material inside; however, the location is not creating any radiological exposure concerns. Last week, facility personnel entered their potential process deviation process to formally document the evaluation of the criticality safety of the configuration and formalize the recovery path forward. Criticality safety personnel confirmed the existing configuration is analyzed and safe, but also noted the importance of ensuring compliant use of connecting boxes. Maintenance personnel are developing work documents to restore operability in the near future. A replacement project for the trolley system is still in progress. The replacement trolley is expected to use more sophisticated control systems to prevent these types of problems.

Area G–Readiness: On Tuesday, N3B submitted to the EM Field Office their startup notification report for the third quarter of 2020. The report identifies three planned readiness activities and levels that require field office approval. The activities are glovebag drill and drain operations in the Dome 231, retrieval of the corrugated metal pipes, and size reduction of the corrugated metal pipes in Dome 375. They have proposed the cognizant secretarial officer as the approval authority for all three activities. Notably, N3B is no longer proposing parallel contractor and federal assessments due to the COVID-19 pandemic (see 5/8/2020 report). The EM Field Office last formally responded to one of N3B's startup notification report in April 2019 (see 6/12/2020 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 10, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 10, 2020

COVID-19 Impacts: There were nine new positive test results for the laboratory workforce this week for a total of 23, 11 of whom have recovered. Three of the new cases are workers associated with the Plutonium Facility.

Plutonium Facility–Radiological Safety: On Monday, the first of two workers preparing to exit the facility alarmed the contamination monitor. Radiological control technicians (RCT) released that worker, but identified contamination on the second worker, including about 200 dpm of alpha on the left and right sides of the face. RCTs successfully decontaminated the worker. The worker had been adjusting equipment underneath and above a glovebox used to process plutonium-238. During the fact-finding, participants discussed several key points of the event including: (1) integrated work documents for the activity identified the use of the 73 page facility radiation protection program document as a control for contamination hazards without further specificity; (2) the document requires RCT support for entry into non-routinely entered spaces—RCT management understood this to be locations like underneath and the top of gloveboxes, but the operations group did not appreciate this distinction since they accessed these spaces several times a week; (3) during the equipment adjustments, the worker identified contamination on his gloves and changed them, but did not contact an RCT in accordance with the document; (4) the worker also alarmed a hand and foot monitor when attempting to depart the laboratory room, but responding RCTs did not perform a whole body survey as expected; (5) discussion as to whether a whole body survey included the face and head; and (6) the work team expressed concerns that the face covering worn for COVID-19 reasons created the need to instinctually adjust the covering and eye protection without surveying gloved hands.

On Wednesday, Weapons Production management convened an unscheduled management review board (MRB) after considering the event described above, the plutonium-238 release event (see 6/12/2020 report), and the unexpected radiation exposure of a worker (see 7/3/2020 report). The MRB heard details of these events, as well as the results of a causal analysis associated with an uptick in the number of skin contamination events. They identified a number of corrective actions associated with radiological protection requirements and training, as well as strengthening behavioral based safety practices across the directorate.

Legacy Facilities–Safety Basis: On Tuesday, N3B sent a letter to the EM Field Office requesting a variance to their approved unreviewed safety question (USQ) procedure. The variance seeks to use the USQ procedure, which only applies to hazard category 2 and 3 nuclear facilities as currently written, for the TA-21-257 radioactive liquid waste facility and the adjacent inactive underground industrial waste lines (see 6/5/2020 report). These locations are currently considered less than hazard category 3 nuclear facilities. If the variance is approved, N3B would then enter their USQ process to address recent radiological characterization data that was higher than expected.

Area G–Operations: N3B and Central Characterization Project personnel successfully completed two shipments of transuranic waste to the Waste Isolation Pilot Plant using the mobile loading unit. The last mobile loading shipment from Area G was in October 2019.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 17, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 17, 2020

Plutonium Facility–Glovebox Safety: On Tuesday, the Triad investigation team for the glove breach and airborne release event briefed preliminary results to senior leadership at the NNSA Field Office (see 6/26/2020 report). They found the root cause of the event to be a less than adequate glovebox glove integrity program. Three contributing causes included: less than adequate implementation of glove inspections prior to hand removal; management’s failure to ensure compliance with existing requirements for contamination monitoring; and the use of a new type of glove with a different thickness and insufficient spare parts. The team proposed many recommendations to improve glovebox operations in the facility including: improving the glove integrity program; formalizing and training expectations for glove use including self-inspections; and evaluating engineered solutions to high hazard operations for reduce hands on work. The team is finalizing the investigation report which is expected next Friday.

Federal Oversight: On Friday, the team from the DOE Office of Environmental Management’s Chief of Nuclear Safety briefed the results of the desktop review phase of their audit on nuclear safety functions at the EM Field Office (see 6/26/2020 report). The team identified five management concerns (defined as significant issues requiring causal analyses) and five findings (defined as violations of requirements), subject to a factual accuracy review. The final report is expected next month and the schedule for the second phase, which includes onsite activities, remains uncertain. Notably, the audit was entirely executed using telework methods.

Area G–Safety Basis: Last week, N3B management declared two potential inadequacies of the safety analysis (PISA) associated with questions concerning: (1) the assumed depth of a fuel pool fire that could impact the number of waste containers impacted and (2) the presence of pipe overpack containers with greater than 80 plutonium-239 equivalent curies that are placed inside a second container—a practice known as doublepacking. EM Headquarters personnel raised the first question during the ongoing federal review of the evaluation of the safety of the situation concerning aisle spacing that was transmitted to the EM Field Office for approval on March 19, 2020. N3B personnel identified the original issue on January 7, 2020 (see 1/10/2020 report). N3B personnel discovered the second issue while conducting a field validation to respond to a Triad inquiry. As a compensatory measure for both issues, N3B management reduced the amount of liquid fuel allowed from 100 to 70 gallons. At the fact-finding, N3B personnel also discussed the need to fully characterize the inventory of pipe overpack containers for the presence of the new fusible filters and expedite replacements. The use of these filters fully protects these containers from fuel pool fires (a damage ratio of zero).

Weapons Engineering Tritium Facility: On Tuesday, subcontractor personnel supporting HVAC upgrade activities noted they had passed a hold point in their work package and reported this to facility management. Further evaluation determined that an individual performed work on an energized system because a lockout/tagout was not installed as required by the work package. Management has paused the work activity while they evaluate corrective actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 24, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 24, 2020

Plutonium Facility–Glovebox Safety: On Tuesday, a glovebox glove failed when a worker was entering the gloves to perform work. One glove and its support ring separated and moved into the interior of the glove box propelled by the worker's arms. The worker followed standard glove breach protocols and remained with his hands in the box until radiological control technicians could assist. There was contamination on the worker's personal protective equipment, but no skin contamination or indications of an airborne release. The glovebox is used for operations with plutonium metal. This is the first known failure of a glove in this manner during operations. The glove in question was installed in May 2019 and has been frequently used. Triad personnel are attempting to determine the cause of the failure.

Safety Basis: On Monday, the NNSA Field Office transmitted to Triad the Board's letter dated July 10, 2020, regarding complex-wide implementation of the potential inadequacy of the safety analysis process. Their transmittal noted the similarity of some aspects of the report with recent NNSA Field Office review comments on Triad's revised Unreviewed Safety Question procedure. They encouraged Triad to consider the information in the Board's report when addressing the field office comments.

Chemistry and Metallurgy Research Building–Safety Basis: On Monday, Triad transmitted a safety basis addendum to the NNSA Field Office and requested its approval. The addendum adds a new specific administrative control for the hot cells that provides an alternative control to protect workers from high radiation fields in the event the current safety-significant interlocks are inoperable. Triad proposed this administrative alternative since spare parts for the existing system are not available, and programmatic use of the hot cells is expected to be completed within a year.

Radioactive Liquid Waste Transuranic Treatment Facility: On Monday, the NNSA Field Office disapproved revision 6 of the safety design strategy for the Transuranic Liquid Waste project pending resolution of comments. Notable comments include the need to: validate the bases for capability given changes to the programmatic mission; validate the preliminary seismic category and limit state determination; develop a confinement strategy; and address DOE-STD-1189 expectations to list major process assumptions. In parallel with this effort, Triad personnel continue to resolve equipment issues needed to make the new Low Level Liquid Waste facility operational following completion of that project in November 2018 (see 1/2/2020 report).

Emergency Management: During the course of the week, lightning appears to have started four small wildland fires in the vicinity of the laboratory. Triad's emergency management personnel monitored the situation, while assets from a number of entities responded and successfully contained the fires. Increased moisture during the latter part of the week has also contributed to a reduced fire danger.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 31, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 31, 2020

N3B—Organizational Learning: Last Thursday, N3B senior management paused activities at Area G and then held a company-wide stand down. The instigating events at Area G included: a work package did not include beryllium controls, a vegetation cutback crew damaged an out of service communications line, and a shipment of low-level waste arrived at an offsite disposal facility with a container tipped over. Management had also noted a trend of events in transuranic waste operations since the end of June. Following briefings to the workforce, N3B management lifted the pause with the exception of low-level offsite waste shipments.

Flanged Tritium Waste Containers: Earlier this month, Triad personnel completed their management self-assessment of planned venting operations at Area G and subsequent transport to the Weapons Engineering Tritium Facility (WETF). The assessment overcame an interruption and challenges associated with COVID-19 related controls. Of note, they took advantage of video footage, including from an unmanned aerial system, to provide assessors with observations of the demonstrated activities. WETF personnel are working through corrective actions and plan to commence the contractor readiness assessment in mid-August. Triad personnel are working through logistics to bring in members of the assessment team from out-of-state locations, since requirements for self-quarantine differ between NNSA and EM operations at the laboratory.

Chemistry and Metallurgy Research Building—Safety Basis: On Friday, Triad submitted to the NNSA Field Office the evaluation of the safety of the situation for the anomalous hydrogen levels in 9979 containers (see 6/19/2020 report). Triad personnel vented the container that was approaching the lower flammability limit at the end of June as the sole operational restriction. The proposed compensatory measures did not add any formal controls. Rather, they will add gas sampling and venting of 9979 containers to existing processes. The NNSA Field Office is reviewing the submittal.

Chemistry and Metallurgy Research Building—Risk Reduction: On Tuesday, the resident inspectors walked down the facility with Triad personnel to observe progress on activities to support future decontamination and demolition activities (see 11/8/2019 report). The initial phase of material removal is complete with approximately 100,000 pounds of low-level waste removed. Electrical disconnects in inactive wings are in progress. Triad has awarded the subcontract for more invasive equipment removal and work planning is in progress. Triad has also begun emphasizing the need for chemistry personnel to smartly ramp down operations in the coming years (e.g., perform wipes downs, complete characterization swipes, and document knowledge transfer).

Emergency Management: On Thursday morning, a 3.7 magnitude earthquake occurred approximately 50 km northwest of the laboratory. Several locations on site, including the Emergency Operations Center, reported minor shaking. There was no damage.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 7, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 7, 2020

Plutonium Facility–Safety Basis Compliance: Last Thursday, workers checking material-at-risk (MAR) values for waste containers in the basement found one with an unexpectedly high value. They noted the container was a pipe overpack rather than a 55-gallon drum as indicated in the records. The safety basis allows a damage ratio to be applied for pipe overpack containers thereby reducing the effective MAR. Further investigation discovered eighteen drums and pipe overpacks that were incorrectly identified as the other type. The work team paused and reported this discovery to operations center personnel who entered the limiting condition for operation related to MAR. Once personnel completed a MAR surveillance, the limiting condition for operation was exited and the pause lifted. At the fact-finding, personnel noted challenges with the efficacy of training to correctly distinguish between various waste containers in order to select the correct type from drop down listing of many containers. We note that the high reliance on container damage ratios in the safety basis complicates operations and that similar challenges have occurred with containers used for nuclear materials (see 7/3/2015 report).

Radiological Laboratory Utility Office Building: Last week, workers receiving a sample shipment from the Chemistry and Metallurgy Research building noted a discrepancy between the expected condition and data recorded on the shipping paperwork. They paused and reported the discrepancy. Further investigation showed that there are several different forms associated with shipments. The forms are inconsistent and some had incorrect information. All MAR coming into the facility must undergo evaluation to ensure that facility MAR limits are maintained. The shipment in question was small and did not approach any facility MAR limits once operators correctly accounted for the contents. Facility management has paused sample receipt while they evaluate near-term corrective actions. They also plan to more thoroughly evaluate the process for receipt of MAR, which will be elevated to a technical safety requirement when the facility transitions to a hazard category 3 nuclear facility to be referred to as PF-400.

Last Thursday, the NNSA Field Office disapproved revision 1 of the safety basis for the PF-400 facility. The field office noted that several of its previous comments were inadequately addressed and they also identified two new comments that require resolution.

Plutonium Facility–Glovebox Safety: On Monday, Triad management transmitted to the NNSA Field Office the final report for the causal analysis and investigation on the glove breach and plutonium-238 uptake event that occurred on June 8, 2020. The report is largely consistent with the results they previously briefed to field office management (see 7/17/2020 report); however, it does identify recommendations to address twelve related concerns that were not causal to the event. Notable recommendations include the need to evaluate: engineered solutions to reducing hands-on work with plutonium-238; annunciation volumes for continuous air monitors across the plant; responsibilities to identify and obtain critical spares for consumable equipment; and the tradeoff between the reductions in extremity radiation exposure from the use of lead lined gloves against the loss of glove strength.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 14, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 14, 2020

Flanged Tritium Waste Containers (FTWC): On Monday, a team composed largely of external personnel commenced the contractor readiness assessment for the venting and transportation of the FTWCs with potentially flammable headspace mixtures that are stored in Area G. The team observed demonstrations of venting and movement activities performed at the mockup facility at Technical Area 49, observed an emergency drill performed at Area G, and conducted numerous interviews. Three NNSA personnel shadowed these activities and EM personnel performed limited oversight of the drill. The startup approval authority for this activity is EM Headquarters. They are currently discussing with the NNSA Field Office on whether additional performance demonstrations will be conducted for observation by federal personnel.

Emergency Management: At the hotwash for the FTWC drill discussed above, N3B personnel noted that they did not receive protective action information from Triad's site-wide mass notification system. In follow-up discussions, Triad management explained that they send messages based on office locations and that there were no offices associated with the affected portion of Area G. As a result, N3B personnel only received notifications from their operations center and not a second anticipated message from Triad. We note that the office based approach to mass notification is ineffective at Area G due to the lack of offices and transient nature of the workforce—points that apply broadly to the whole laboratory and were documented in the Board's letter dated October 11, 2017. Subsequent to the Board's letter, Triad documented additional instances of problems with this system in several after-action reports, most recently including the exercise conducted at Area G on February 19, 2020. Notwithstanding the above concern, corrective actions from that exercise proved effective during this drill, including improved coordination between the operations center and emergency management.

Legacy Facilities: Last Wednesday, EM Headquarters approved the variance N3B requested to its unreviewed safety question procedure (see 7/10/2020 weekly). Last Thursday, N3B used this variance to declare a potential inadequacy of the safety analysis regarding a higher than expected radionuclide inventory for the TA-21-257 radioactive liquid waste facility and the adjacent inactive underground industrial waste lines. N3B revised the facility hazard categorization and concluded these facilities contain hazard category 3 quantities of nuclear materials. N3B paused work on these facilities. They are developing the facility hazard categorization documentation to allow for additional sampling and characterization activities to support planning of deactivation and decommissioning work. They also plan to perform a formal causal analysis.

Area G—Corrective Actions: Last Friday, N3B safety basis personnel noted that the daily shift order in place to address the recent potential inadequacies of the safety analysis (see 7/17/2020 report) was insufficient. Specifically, they identified that there is no analysis for the behavior in a fire of a pipe overpack container (POC) that is also overpacked. Consequently, the existing shift order that lowered fuel limits did not protect them from a fire insult. The facility's fuel log showed that fuel had been in the vicinity of the two relevant POCs since the shift order was issued on July 1, 2020. On Thursday, N3B personnel issued a new daily shift order that prohibits all fuel in the vicinity of the two POCs. Longer term, they plan to replace the POC filters with the new fusible model that will allow a damage ratio of zero for the POCs. N3B management is also evaluating how an inadequate corrective action was enacted for a safety basis issue.

Engineering: Last Thursday, the NNSA Field Office approved Triad's ten-year update to the natural phenomenon hazards analysis developed in 2014 (see 5/29/2020 report). They further concurred with Triad's plan to complete the update within 3 years not to exceed September 2024.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 21, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending August 21, 2020

Flanged Tritium Waste Containers (FTWC): On Wednesday, the contractor readiness assessment team out-briefed its review of the FTWC venting and handling activities at Area G (see 8/14/2020 report). The team noted the superb dedication of the FTWC crew, but identified four findings concerning: (1) the need to define additional steps and actions in the procedure, including addressing differences between the mockup and actual settings, use of realistic timing, and contingencies; (2) incomplete hazard analysis and identification for actions to support timely resolution of potential abnormal conditions; (3) inadequate use of personal protective equipment, particularly gloves; and (4) the failure to demonstrate required responses to safety basis violations during simulated scenarios. Triad personnel have begun corrective actions in advance of the upcoming federal readiness assessment.

Nuclear Environmental Sites: On Wednesday, N3B management declared a violation of the technical safety requirements for a missed in-service inspection. The safety basis requires an inspection of the inventory isolation systems annually and within 30 days of “non-routine natural phenomena or external man-made events.” Subsequent to a request for a record, N3B personnel reviewed additional records and determined that a required inspection was not conducted for a non-routine rainfall event that occurred in early July. At the fact-finding, N3B personnel identified concerns and corrective actions associated with the lack of institutionalization following the loss of key personnel, insufficient criteria for non-routine events, roles and responsibilities, and maintaining best management practices. This week, N3B found the isolation systems to be satisfactory after they completed inspections for last month’s minor earthquake.

Emergency Management: Last Friday, the DOE Office of Enterprise Assessments (EA) issued the report for its assessment of emergency management (see 2/21/2020 report). EA noted that Triad has established a well-staffed emergency response organization that is equipped with state-of-the-art equipment. Nonetheless, they observed performance challenges during the February exercise. They identified three findings: (1) Triad did not provide accurate and effective initial notifications; (2) Triad did not demonstrate an effective capability to formulate and identify protective actions for onsite individuals and the public; and (3) Triad did not demonstrate an emergency operations system that effectively validates and coordinates incident information to establish and maintain situational awareness and a common operating picture. EA noted that Triad identified findings similar to the last two. Additionally, EA identified one deficiency and 11 opportunities for improvement that notably include: improving the coordination between facility-level and site-level protective actions, consider revising Triad and N3B procedures to ensure habitability at key incident response locations, and conducting an analysis of the Los Alamos County dispatch database to ensure effective integration with LANL. The NNSA Field Office and Triad are reviewing the report.

Infrastructure: On Wednesday, Triad transmitted to the NNSA Field Office for approval the major modification determination and safety design strategy for the Los Alamos Plutonium Pit Production Project. The project includes equipment installation in several rooms within the Plutonium Facility, infrastructure capabilities at Technical Area 55 such as office and training space, and capabilities elsewhere at the laboratory such as warehouse and support facilities. Triad determined that the activities to be conducted inside the Plutonium Facility are bounded by the existing safety basis and therefore do not constitute a major modification. The field office is reviewing the submittal.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 28, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 28, 2020

DNFSB Staff Activity: On Monday, a staff team conducted a teleconference with Triad and NNSA Field Office personnel to discuss the project to update the accident analysis calculations for the Plutonium Facility. This project will update several key models, including the leak path factor (LPF), as part of the upgrade of the safety basis to meet DOE-STD-3009-2014 and support increased production activities. The staff team focused on understanding interim review and approval milestones prior to Triad's planned final submittal in March 2022. NNSA is developing a review plan to identify their approach to reviewing interim deliverables, as well as the necessary expertise. Of note, they have preliminarily identified only one individual who has some familiarity with the software related to LPF; however, they lack the correct software versions and an appropriate computing environment.

Legacy Materials–Work Planning and Control: On Tuesday, operators opened a legacy item inside the hot cell at the Chemistry and Metallurgy Research (CMR) building. They were expecting bulk uranium-233 based on historical records, but instead found metal turnings that began to oxidize and glow. They immediately placed the item into a closed metal container. At the fact-finding held on Wednesday, participants noted that their integrated work document was inappropriate for turnings and did not include basic controls such as staging extinguishing media in the hot cell. Processing of legacy items retrieved from the Plutonium Facility vault, including this one, has resulted in several other recent problematic events (see 6/26/2020, 3/6/2020, and 7/19/2019 reports). Given these events, Plutonium Facility personnel are currently revising procedures in order to take a more conservative approach when processing legacy materials to accommodate a broader degree of unexpected material properties. We note that CMR personnel would benefit from a similar approach.

Transuranic Waste Facility: Triad personnel continue efforts to demonstrate that the firewater pumps can be credited as safety-significant (see 11/22/2019 and 5/31/2019 reports). New firewater pumps are on hand; however, they would prefer to demonstrate the acceptability of the current pumps, since pump replacement would involve a significant effort requiring a week or more of a facility firewater outage. All testing of the existing pumps so far has shown that they meet minimum flow requirements to the most distant sprinkler head; however, the pump curves have deviated substantially from the acceptance curve. Facility personnel are currently awaiting the arrival of additional equipment to perform a complete re-baselining of the pump curves with a manufacturer's representative. If this effort is successful, Triad engineering personnel believe they will be able to credit the existing pumps as safety-significant and use the new ones as spares.

Plutonium Facility–Safety Basis: On Wednesday, Triad personnel concluded they had a deficient safety basis (i.e., a positive unreviewed safety question) related to the detector operability criteria for the criticality alarm system. They entered the new information process on August 6th following questions from the NNSA Field Office and declared a potential inadequacy in the safety analysis on August 12th. They did not implement any compensatory measures given the low frequency of the situation of concern.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 4, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 4, 2020

DNFSB Staff Activity: On Monday, a staff team conducted a teleconference with Triad and NNSA Field Office personnel to discuss the results of its review of the safety basis that will be used to transform the Radiological Laboratory Utility Office Building into a hazard category 3 nuclear facility to be termed PF-400.

Area G: Last Wednesday, N3B personnel received notification from the Central Characterization Program (CCP) that a pipe overpack container had recently been assayed and assigned a value of 86.9 plutonium-239 equivalent curies (PE-Ci). Since this value exceeded the current safety basis limit of 80 PE-Ci, N3B personnel took action to quickly isolate the drum, remove liquid fueled vehicles from the area, and doublepack the container later that day. The container had a previous assay value of 65.6 PE-Ci based on measurements at the Plutonium Facility performed in 2014. Differences in assay values sometimes occur because different instrumentation is used. N3B personnel are reviewing the inventory to determine if CCP has not yet measured other containers with existing assay values approaching the limit.

Plutonium Facility–Fire Protection: Last Wednesday, during work on the backshift in the basement, a small fire occurred during pipe brazing activities that were covered under a hot work permit. After workers observed a small amount of unexpected cheesecloth debris in the pipe ignite, they immediately extinguished and then smothered it with wet cheesecloth. The incident was reported to the operations center several hours later by a radiological control technician. At the fact-finding held this week, attendees discussed what level of small incipient fires were acceptable during hot work activities. In this case, since the cheesecloth debris was unexpected, facility management determined that the job should have been paused and the incident reported more promptly. Triad management is evaluating whether changes to the hot work permit process or abnormal event procedures are warranted for small fires of this type.

Area G–Emergency Management: N3B personnel are preparing for startup of drill and drain activities later this calendar year. On Wednesday, they performed a coached drill involving worker response to a foul odor released by drilling into a drum. The odor caused medical symptoms in support workers outside of the Dome 231 Perma-Con, since they were not wearing chemical respiratory protection. One concern noted during the drill was unreliable radio communications between the control room and the workers inside the Perma-Con.

Flanged Tritium Waste Containers (FTWC): Triad personnel performed additional mockup practice for venting at Technical Area 49 following the feedback from the contractor readiness review (see 8/21/2020 report). During this week's mockups, they tested moving a FTWC on a surface that more closely represents the metal grating found in the actual Area G shed. They also practiced disassembly of the portable ventilation skid while treating it as internally contaminated. Closure of corrective actions and preparations for the federal readiness assessment continue.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 11, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 11, 2020

Transuranic Waste Management: Triad personnel continue to make progress shipping containers of newly generated transuranic waste to the Waste Isolation Pilot Plant (WIPP). For this fiscal year, they have completed 35 shipments with about 1100 containers. This progress has helped alleviate accumulation concerns within the Plutonium Facility and its outdoor storage pads. Triad plans to continue shipping two loads per week as the certified container inventory and DOE shipment allotments permit. Triad will use the RANT Shipping Facility, which has no weather limitations.

Since the resumption of operations at RANT, N3B has had more WIPP certified containers ready for shipment than Triad (currently about 200 more), but DOE has allotted them fewer shipments that also remain dependent on favorable weather conditions for mobile loading. N3B has no additional shipments assigned for this month and has completed just 5 shipments with about 50 containers for the fiscal year. N3B and Triad personnel continue to develop the processes needed to support loading legacy waste containers at RANT; however, the progress has been slow and there is no target date for achieving this capability. We note that this week's wintery conditions underscore the need for this shared indoor loading capability to reduce legacy waste inventories at Area G. In particular, the winter months often result in additional shipment allotments to LANL due to cancellations at Idaho National Laboratory.

Radiological Laboratory Utility Office Building: Last Thursday, Triad transmitted to the NNSA Field Office for approval a revised safety basis for the upgrade of RLUOB to a hazard category 3 nuclear facility to be known as PF-400. The submittal includes changes intended to address the field office comments on the previous submittal (see 8/7/2020 report). On Thursday, Triad received NNSA Headquarters approval on its five year exemption request related to the deficient or missing fire barriers in the currently occupied building. Among the conditions of approval, Triad is to conduct semi-annual building evacuation exercises and annually reassess the compensatory measures. The NNSA Field Office also requested that Triad consider the suggestions from the DOE Office of Nuclear Safety, including documenting the deficiencies in the safety basis for PF-400.

Area G–Safety Basis: On Wednesday, the EM Field Office rejected two of N3B's evaluation of the safety of the situation (ESS) submittals. One was the ESS for the fuel pool fire depth issue, which was originally identified on July 1, 2020 (see 7/17/2020 report). One reason for rejection was the lack of detail supporting the evaluation of the operational restrictions for all accident scenarios. The other rejected ESS was for the temporary unvented drum condition created during flammable gas sampling, which was originally identified on January 30, 2020 (see 1/31/2020 report). Reasons for rejection included the need to protect the duration of the unvented condition and the length of time taken to submit the ESS.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 18, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 18, 2020

COVID-19 Pandemic: On Monday, both field offices and N3B transitioned to Phase 2. Triad also transitioned to normal operations with maximized telework. Moving forward, the NNSA Field Office is evaluating the appropriate level of field presence for facility representatives and safety system oversight personnel. The EM Field Office has had a facility representative largely on site prior to Phase 2 and will be adding personnel in the coming weeks.

Onsite Transportation: The uranium-233 metal turnings that underwent a pyrophoric reaction at the Chemistry and Metallurgy Research building last month (see 8/28/2020 report) had been transferred from the Plutonium Facility under Triad's transportation safety document (TSD). At the fact-finding for that event, safety basis personnel questioned whether the actual physical form of a metal turning (as opposed to the assumed solid metal) was compliant with the TSD. This Monday, Triad declared a potential inadequacy of the safety analysis (PISA) for the TSD, since the analysis does not consider pyrophoric materials. In this case, Triad personnel did not enter their new information process, consistent with procedural guidance, when the issue was first raised on August 25, 2020. Instead, they entered the process after the PISA declaration in order to document their findings. In a letter dated July 10, 2020, the Board noted similar concerns with implementation of the PISA process around the complex.

Area G—Safety Basis: Last Thursday, N3B management sent a letter to the EM Field Office communicating their intention to develop a safety basis that complies with DOE-STD-3009-2014 to replace the existing document developed in 2012. N3B indicated they would provide a detailed safety basis strategy and schedule by October 30, 2020. The EM Field Office first acknowledged the need to develop a modern safety basis in 2015. Since then, various initiatives—including using an outside contractor to develop an entirely new safety basis—have not succeeded (see 7/5/2019, 10/18/2019 and 11/22/2019 reports).

Legacy Facilities: Last Thursday, N3B management submitted to the EM Field Office for approval the evaluation of the safety of the situation (ESS) concerning the exceedance of the hazard category 3 nuclear facility threshold for the TA-21-257 radioactive liquid waste facility and the adjacent underground industrial waste lines (see 8/14/2020 report). The ESS notes that the operational restrictions ensure that both structures remain in a safe condition, but that the effects of natural phenomena hazards are unanalyzed. The ESS further asserts that the current state of the systems and physical forms of the radiological contamination would result in a minimal release should the systems be disturbed. The ESS notes they intend to submit a justification for continued operations within six months to support additional sampling and characterization activities.

Area G—Fire Protection: Last Thursday, EM Headquarters approved a June 2018 request from N3B's predecessor regarding a suite of permanent exemptions for fire protection systems. The approval notes that the code of record for most of Area G remains largely dependent on DOE directives issued in the early 1990's, but also that any new structures will fall under DOE Order 420.1C, *Facility Safety*.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 25, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 25, 2020

Area G–Safety Basis: On Monday, N3B personnel determined that a potential inadequacy of the safety analysis exists for an as-found condition where the radioactivity values for some sealed sources are incorrectly listed in the evaluation of the safety of the situation (ESS) for fire analysis of sealed sources. N3B personnel discovered the discrepancy while performing an extra check of the source values against data in the waste management tracking software system prior to moving sources into Area G. An additional validation against manufacturer’s data concluded that the error resided in the ESS values. The sources in question have not been in Area G since 2015. Transfers of sources listed in the ESS are currently paused and an extent of condition is in progress. This ESS was originally developed in October 2017 prior to N3B assuming control of Area G. N3B adopted the document as-is and performed implementation reviews following contract transition.

Plutonium Facility–Glovebox Safety: On Wednesday, a glovebox glove failed in a manner similar to a July event where the glove and support ring separated and moved into the interior of the box (see 7/24/2020 report). The event occurred in the same box, with the same type of oval gloveport, and the same worker. A thinner glove was in place this time, and the separation occurred when the worker was reaching to sweep up materials rather than upon entry of the gloves. The response to the breach went according to procedure. There were no airborne radioactivity alarms, and while the worker’s personal protective equipment was contaminated, there was no skin contamination. Radiological control technicians detected a small amount of contamination on the floor directly under the breached gloveport which was immediately cleaned up. Following the July event, testing revealed that the determining factor to fail the oval gloves appears to be force on the glove at an angle, versus straight into the box. Plutonium Facility management paused all operations using this brand of oval gloveport pending additional evaluation.

Plutonium Facility–Readiness: Last month, Triad personnel completed an extent-of-condition review regarding proper screening of new or restarted activities for compliance with DOE Order 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities*. They performed the review after identifying a deficiency that permitted activities that screened below the formal readiness review level to proceed without a quality review performed by the institutional readiness program manager. The review examined all screened-out activities since October 1, 2018, and identified 8 activities that will be forwarded for quality review. They also identified 21 activities that are already operational and validated they did not meet the threshold in DOE Order 425.1D. To prevent recurrence, Triad personnel are revising command media at the institutional and facility level.

Plutonium Facility–Operations: Triad personnel continue to increase backshift operations associated with the removal of contaminated systems and new construction activities (see 6/5/2020 report). On Monday, the resident inspectors observed a recently instituted turnover walk-down intended to support coordination and operational awareness between shifts. Of note, the NNSA Field Office has not yet established oversight coverage for the backshift due to staffing shortages.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 2, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 2, 2020

DNFSB Staff Activity: On Wednesday, a staff team conducted a teleconference with NNSA and Triad personnel to discuss the Phase 1 technical studies of the Plutonium Facility Seismic Performance Reassessment Project.

Plutonium Facility–Continuous Improvement: Last week, Triad personnel completed their causal analysis of the unexpected thermal excursion and higher than expected occupational dose during the calcination of a legacy item (see 3/6/2020 report). While the causal team was unable to determine the technical cause of the thermal excursion due to competing production priorities for sample analysis resulting from the COVID-19 pandemic, they identified the direct cause, seven contributing causes, and an overall root cause of inadequate procedural direction on the conditions necessary to engage the radiological control technician to perform dose surveys. The team further identified that no formalized instruction existed regarding the extent of research necessary for legacy feed materials despite the potential for those materials to generate an increased radiation field under certain conditions. The team recommended nine actions including: modifying procedures to ensure radiological control technician and expert engagement when appropriate and consider the use of hold points; enhancing pre-job briefings to be task specific; scheduling an independent operational review for material processing; completing sample analysis to determine the technical cause of this event; and conducting an extent-of-condition review of other legacy items in the vault. As a result of challenges with the timely completion of this causal analysis, Triad personnel will also be conducting a causal analysis of the causal process in order to inform an improvement plan.

Plutonium Facility–Glovebox Safety: Facility management issued a standing order on Thursday outlining the process to resume work in gloveboxes using oval ports of the type involved in the push through events that occurred last week and in July (see 9/25/2020 report). The order requires reviewing all procedures for these boxes to determine if operations can be conducted without putting stress on the oval locking ring and training in the Cold Lab for all impacted workers. The training sessions started this week and include demonstrating the range of motion in glove use for normal operations as well as having the workers make tremendous efforts to deliberately fail a glove ring.

Plutonium Facility–Conduct of Operations: Two Thursdays ago, workers preparing to move an item out of a glovebox checked its contents and noted it was not compliant with the criticality safety posting for the box and represented an overmass condition. There was discrepancy between the planning paperwork and the actual contents of the container which was not identified when the object was moved into this box about two weeks prior to the planned move out. Criticality safety personnel determined the current condition is safe and stable, and a plan to recover the box is in development.

Chemistry and Metallurgy Research Building: Last Thursday, a worker performing re-lamping activities in a room with legacy contamination had radioactive contamination transfer to his personal protective equipment. The supporting radiological control technician experienced instrument issues, but was able to detect contamination on the torso, finger tips, and COVID face mask. There was no skin contamination. At the fact finding for this event, personnel noted that pre-surveys of the area were not performed prior to opening the light fixtures, and that communication regarding the role of radiological support were less than adequate. As a correction action, facility management plans to emphasize the importance of performing radiological surveys prior to working in normally inaccessible areas.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 9, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 9, 2020

DNFSB Staff Activity: On Wednesday, a staff team commenced a series of remote interactions with Triad and NNSA personnel as part of a review of credited safety systems. This week, they discussed the Oxygen Monitoring System and Tritium Gas Handling System at the Weapons Engineering Tritium Facility.

Plutonium Facility–Conduct of Operations: Last month, while attempting to move items into a safe, Triad personnel noted that the criticality safety posting prohibited the type of containers they were using. They also noted that containers currently inside the safe were non-compliant. The posting for this safe had been updated in August with restrictions associated with container geometry and container type. The containers in the safe were compliant with the geometry, but not the type. During the fissile material operations review to change the posting in August, Triad personnel did not identify that the contents of the safe were non-compliant with the new posting. Criticality safety personnel determined the safe is currently in a safe and stable configuration. The safe is posted out-of-service pending completion of a recovery plan.

Nuclear Criticality Safety: Last Wednesday, Triad’s institutional Nuclear Criticality Safety Committee issued to the LANL Director its report on the status and quality of the nuclear criticality safety program for fiscal year 2020. They concluded that the program needs improvement, but is on a positive trajectory and is making improvements at a satisfactory rate. On staffing, the report noted that they still do not have sufficient staff for institutional criticality safety needs; however, they have been making progress with staffing more than doubling since 2015. On the backlog of criticality safety evaluation documents, the report notes that progress is exceeding expectations with the backlog now expected to be eliminated within 18 months. The report also notes the need to sustain disciplined formality of operations especially for construction operations supporting the 30 pits per year mission.

Plutonium Facility–Contaminated Equipment Removal: Last week, Triad personnel removed a large glovebox weighing nearly four tons from the facility. This week, they held a post-job review for the activity in order to improve efficiency for future large equipment removals. The glovebox is currently packaged and staged on an outdoor waste storage pad within Technical Area 55. Triad is developing a strategy to disposition this oversize waste stream, which is expected to increase in the next few years with the planned removal of about 60 gloveboxes alone to support pit manufacturing. There is limited space on the pads for staging of future removed gloveboxes and oversize equipment. Previously, oversize containers were relocated to Area G to free up space on the pads (see 9/17/2017 report); however, neither Triad nor N3B currently possess the capability to size reduce or decontaminate oversized equipment.

Area G: This month, N3B received allocations for shipments to the Waste Isolation Pilot Plant. Using mobile loading, they successfully completed three shipments last week, two this week, and plan two next week. Additionally, they are targeting the week of October 19th to work with Triad and debut the use of the RANT Shipping Facility for two N3B loads.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 16, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 16, 2020

DNFSB Staff Activity: The staff continued remote interactions with Triad and NNSA personnel for a review of safety systems. This week, they discussed the Electrical Distribution System and Seismic Power Cutoff System at the Transuranic Waste Facility (TWF) and the Criticality Alarm System at the Plutonium Facility.

Federal Oversight: Last Thursday, a team from NNSA's Chief of Defense Nuclear Safety briefed the results of its biennial review of nuclear safety oversight by the field office (see 3/17/2017 report). The team evaluated 13 functional areas and concluded that 12 met expectations and four showed improvement since the 2017 review (see 3/17/2017 report). The functional area that did not meet expectations was oversight. There were six findings and two weaknesses associated with oversight. The findings indicate that the field office needs improvement in performing, documenting, and conducting management review of its oversight.

Transuranic Waste Management: On Monday, TWF operators took a safety basis required action to immediately remove two waste containers from the facility after conservatively concluding their contents had a potential for a chemical incompatibility. They based their decision on information received last Thursday from the Central Characterization Program (CCP) regarding a forthcoming non-conformance report on a failure of one of the containers at TWF to meet the Basis of Knowledge requirements for oxidizing chemicals in transuranic waste. The TWF safety basis prohibits such waste. After researching the situation, Triad personnel identified two other containers (one at TWF and the other at the Plutonium Facility) that were generated from the same parent item of legacy residues that had been stored in the Plutonium Facility vault for more than a decade. Triad personnel successfully shipped the two containers from TWF back to the Plutonium Facility within about 2.5 hours of determining the need to take action. All three containers currently reside on one of the outdoor storage pads, since the safety basis for that location does not prohibit incompatible chemicals in waste containers. Triad's subsequent research suggests that the contents are not chemically incompatible and they plan to submit associated evidence to CCP. Several aspects of this situation are addressed in DNFSB/Tech-46, *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at Los Alamos National Laboratory*.

Area G–Safety Basis: Last Tuesday, N3B submitted to the EM Field Office a revised evaluation of the safety of the situation (ESS) concerning the temporarily blockage of waste container vents with a spatula-like tool during flammable gas sampling (see 1/31/2020 report). N3B sent the original ESS to the EM Field Office in March, which was rejected in September (see 9/11/2020 report). The revised ESS leaves flammable gas sampling operations paused pending the development of a justification for continued operations, planned for December 10, 2020, that will develop any controls needed to resume gas sampling. The NNSA Field Office approved Triad's ESS for the equivalent issue in March (see 3/20/2020 report).

Plutonium Facility–Safety Basis: Earlier this month, the NNSA Field Office sent a letter to Triad requesting revision of the ESS associated with the trailer loaded with combustibles parked in proximity to transuranic waste containers (see 5/29/2020 report). The field office acknowledged that the relocation of the trailer addressed the immediate hazard it posed, but noted that the ESS did not provide analysis supporting that an ordinary combustible fire is bounded by a fuel pool fire. They further noted that questions could not be answered associated with the need to elevate the safety significance of combustible limits or the need for other controls and requested the analysis within 60 days.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 23, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 23, 2020

DNFSB Staff Activity: The staff held a third week of remote interactions with Triad and NNSA personnel for a review of safety systems. This week, they discussed the Electrical Distribution System, Seismic Power Shutoff System, Chlorine Gas Delivery System, and the Full Scale Test Facility at the Plutonium Facility.

Flanged Tritium Waste Containers (FTWC): An eight member team, three of whom were present onsite, commenced the federal readiness assessment for venting and handling of the FTWCs stored at Area G. Members of the team were present for mockup evolutions during the contractor readiness assessment (see 8/14/2020 report). This week, they observed additional demonstrations of FTWC movement, as well as the assembly and disassembly of the ventilation system. The team expects to complete review activities next week.

Transuranic Waste Management: N3B worked with Triad personnel to complete two shipments this week from the RANT Shipping Facility. The shipments included 28 drums and four standard waste boxes. This is the first usage of the facility by N3B and represents an important demonstration of indoor loading capability for their legacy waste inventory. Moving forward, Triad and N3B are evaluating how to combine waste shipments for optimal shipments to the Waste Isolation Pilot Plant.

Radioactive Liquid Waste Treatment Facility: On Monday, a worker was struck in the back by a 15 to 20 pound plastic bag of radioactive waste that fell about 20 feet into an underground vault. The vault services an intra-facility transfer line for transuranic liquid wastes and is a permitted confined space. The incident occurred when the tape that was used to attach the bag to lifting equipment failed and the worker was standing under the load. The worker was not contaminated, but received return-to-work restrictions for the injury. On Wednesday, fact-finding participants identified the need for a number of significant corrective actions prior to resuming this activity, including: (1) ensuring the work package complied with institutional requirements for hoisting and rigging; (2) selecting an engineered solution to secure waste to the lift line; and (3) determining an effective means of communications between workers in the vault and aboveground given the personal protective equipment required for the chemical and radiological hazards. Triad personnel concluded that this event did not constitute a reportable near-miss, which DOE defines as when happenstance is the main reason the event did not result in a reportable injury.

COVID-19 Impacts: In recent weeks, the State of New Mexico and the laboratory have experienced an increase of cases. On Monday, the LANL Director issued an all-hands message reiterating the importance of following the COVID controls and the need to maximize telework practices. Notably, Triad has experienced several instances of workers arriving onsite with symptoms. They have also experienced several instances where workers in break rooms resulted in close contacts necessitating the precautionary isolation of many workers. In one example, a large number of radiation protection staff members in the Plutonium Facility were isolated. Fortunately, Triad's onsite testing resulted in a same day negative test result allowing all workers to return the next day. Triad management is reassessing break room configurations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 30, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaque and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 30, 2020

DNFSB Staff Activity: The staff completed a fourth week of interactions with Triad and NNSA personnel for its remote review of credited safety systems. This week they discussed high efficiency particulate air filters for the Plutonium Facility. They also held discussions with Triad management and NNSA Field Office personnel to discuss institutional expectations and oversight for safety systems.

Radiological Laboratory Utility Office Building (RLUOB): Last Friday, the NNSA Field Office approved a revised safety basis for the upgrade of RLUOB to a hazard category 3 nuclear facility to be known as PF-400. There are two conditions of approval. The first directs Triad to develop a quality assurance plan specific to PF-400 to ensure that defense-in-depth controls identified in the safety basis and other controls designated by NNSA comply with the requirements in subpart A of 10 CFR 830, *Nuclear Safety Management*. The second condition of approval directs Triad to resolve the remaining four field office review comments by the first annual update of the safety basis.

Chemistry and Metallurgy Research (CMR) Building: Last Friday, Triad transmitted to the NNSA Field Office a revised evaluation of the safety of the situation (ESS) for the anomalous hydrogen gas generation in containers (see 6/26/2020 report). NNSA approved the first revision of the ESS in August with a condition of approval that required Triad to evaluate the physical hazard to a worker from an explosion. Triad's revised ESS concluded that a previous compensatory measure to sample and vent these containers needs to be elevated to a Specific Administrative Control in order to reduce the likelihood of a hydrogen explosion causing a serious physical injury to a worker.

DNFSB/TECH-46 Update: On September 24, 2020, the Board issued Technical Report 46, *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at LANL*. DNFSB/TECH-46 uses NNSA and EM operations at LANL as a case study regarding safety bases for transuranic waste operations subsequent to the radiological release events in 2014 at the Waste Isolation Pilot Plant and in 2018 at the Idaho National Laboratory. The technical report highlights: (1) the lack of hazards analyses informed by chemical compatibility evaluations, (2) accident analyses that inappropriately assume initial conditions and do not defensibly estimate the amount of radioactive material released by an energetic chemical reaction, and (3) the need to incorporate multiple layers of protection beyond the waste container to reduce consequences of an accident. Since issuance, N3B has formally entered a process to examine its safety basis for inadequacies, overpacked and relocated potentially vulnerable containers, and commenced a broader extent of condition review. N3B has also reached out to the Board's staff to better understand the report. Triad is studying the implications of the report for its operations. NNSA and EM are striving to develop an integrated response.

Contract Management: Earlier this month, both field offices approved their respective performance evaluation and measurement plans for fiscal year 2021. For EM and N3B, incentives of interest to the Board include remediating or repackaging 262 m³ of transuranic waste and developing a new safety basis for Area G that complies with DOE Standard 3009-2014. For NNSA and Triad, key outcomes include executing various construction projects supporting infrastructure within established baselines and effective implementation of the NNSA-approved enduring waste management plan to safely de-inventory transuranic waste from the laboratory.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 6, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 6, 2020

Transuranic Waste Management: Triad personnel completed two shipments of transuranic waste using the mobile loading capability from an outdoor pad at the Plutonium Facility to the Waste Isolation Pilot Plant (WIPP). The shipments contained a total of about 48 containers and included a large fraction of containers that could not be shipped to the Transuranic Waste Facility of the RANT Shipping Facility primarily due to material-at-risk limits or other onsite shipping requirements. The last mobile loading shipment from an outdoor pad at the Plutonium Facility was in September 2018 (see 12/13/2019 report).

Area G–Safety Basis: Last Friday, N3B submitted to the EM Field Office for review and approval a safety basis strategy for developing a new Area G safety basis. The field office has been pursuing various strategies to improve or otherwise develop a new safety basis for Area G since 2015 (see 7/5/2019 report). N3B's current strategy states that a new safety basis will be developed using DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, and DOE-STD-5506-2007, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities* (or successor) for waste parameter calculations. The strategy states that planned changes from the existing safety basis will incorporate: (1) revised fire standoff distance calculations; (2) material-at-risk calculations using the draft revision of DOE-STD-5506; (3) a revised number of containers involved in a fuel pool fire as a function of revised pool fire size calculations; and (4) lessons learned the WIPP radiological release event and DNFSB/TECH-46, *Potential Energetic Chemical Reactions Involving Transuranic Waste at LANL*. The strategy further indicates that only near-term activities will be analyzed and that planned container retrievals from underground pits and trenches will need to be analyzed in future revisions. The schedule includes submittal of draft chapters during the course of the year leading to a final completed document to the field office in February 2022. Additional time will be needed for a final federal review and approval cycle. N3B plans to develop a separate schedule for implementation and notes that it could be impacted if the new safety basis identifies safety controls that are not currently budgeted. The EM Field Office is reviewing the strategy.

Plutonium Facility–Glovebox Safety: This week, facility management released analytical chemistry personnel to resume use of oval gloveports of the type involved in the recent glove push-through events (see 10/2/2020 report). With this release, work remains paused in only one of the nine gloveboxes using oval ports. Triad has also been closely collaborating with the vendor on designs and testing of prototypes for an engineered solution.

COVID-19 Impacts: The State of New Mexico and the laboratory continue to experience growth in new weekly cases. Plutonium Facility operations were impacted this week by a confirmed positive case with fourteen close contacts requiring precautionary isolation. These individuals largely work in the same group providing a support function for compliant facility operations. The NNSA Field Office and Triad senior leadership discussed additional measures to minimize operational impacts, including an effort to develop lessons learned from recent cases with large numbers of close contacts.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 13, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 13, 2020

Flanged Tritium Waste Containers (FTWC): The DOE team completed its readiness assessment for venting and handling of the FTWCs stored at Area G and out-briefed site personnel on Tuesday. The team concluded that the operation can start safely following resolution of four pre-start findings, one related to radiological protection and the other three in safety basis. The team also provided two management concerns: (1) that insights from the contractor readiness assessment were not fully addressed and (2) safety basis issues identified by the federal readiness assessment should have been captured during the implementation verification review. The team also noted that their review assumed that the actual venting evolution would occur in this calendar year. If weather or other factors cause a significant delay, the team recommended that an additional mockup evolution be performed for onsite members of the readiness team to demonstrate continued proficiency.

Area G–Readiness: On Monday, a ten person team commenced the contractor readiness assessment for restart of Glovebag and Drill & Drain operations at Area G. These activities will remediate transuranic waste containers in the Dome 231 Perma-Con to support compliant shipment to the Waste Isolation Pilot Plant. Glovebag activities include removal of prohibited items such as aerosol cans from waste, splitting contents of high-activity drums, and treatment of ignitable or corrosive waste. Drill & Drain operations will puncture drum liners to drain liquids or sludge, which will be captured and stabilized. The drained drum liners will then be returned to a compliant container.

Readiness: Last Friday, the EM Field Office approved N3B’s startup notification report (SNR) for the fourth quarter of fiscal year 2020. The approval letter further outlines the history and disposition of SNRs submitted by N3B since December 2019. The field office noted concerns that were informally transmitted to N3B with the expectation of remedy in subsequent submittals. The concerns primarily involved schedule discrepancies and the absence of the FTWC venting activity from the SNR. The EM Field Office last approved a SNR in April 2019 and has been evaluating N3B’s revised procedure for its readiness process for the last year (see 6/12/2020 report).

On Monday, the NNSA Field Office approved Triad’s SNR for the fourth quarter of fiscal year 2020. The field office acknowledged some projected dates had changed and reminded Triad of the requirement to update information that changes between quarterly SNR submittals.

Chemistry and Metallurgy Research Building: On Thursday, Triad transmitted to the NNSA Field Office for review and approval the evaluation of the safety of the situation (ESS) regarding the potential for a perchlorate explosive hazard in the facility’s drain system. The ESS notes that the concern is based on a conservative interpretation of visual evidence rather than sampling. The ESS proposes to conduct sampling activities prior to work on drains that may have supported perchlorate processing operations.

COVID-19 Impacts: Case counts at the laboratory continued to increase, consistent with regional trends. The laboratory also continued to experience several events with confirmed positive individuals that had high numbers of close contacts.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 20, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 20, 2020

DNFSB Staff Activity: The staff team performing a review of credited safety systems held several follow-up discussions with Triad and NNSA Field Office personnel to resolve outstanding questions from the initial interactions. On Wednesday, the Technical Director remotely briefed the Northern New Mexico Citizens' Advisory Board on DNFSB activities related to the Environmental Management mission at Los Alamos.

Weapons Engineering Tritium Facility: On Monday, following evaluation of questions raised during the Board's staff review of safety systems, Triad personnel declared a potential inadequacy of the safety analysis (PISA) for the oxygen monitoring system. The alarm setpoint for maximum oxygen concentration may be non-conservative as compared with the most current version of National Fire Protection Association 69, *Standard on Explosion Prevention Systems*. While this is being further evaluated, facility management believes they are in a safe configuration given they check for leaks and initiate purges at oxygen concentrations well below the alarm setpoint.

COVID-19 Impacts: On Wednesday, operations within Area G were impacted by a presumptive case and a number of associated close contacts. Currently, Area G is in a safe configuration with transuranic waste operations suspended while key staff are self-isolating. The impacted operations include the emergency drill and a field evolution for the contractor readiness assessment of glovebag and drill and drain operations (see 11/13/2020 report). N3B and Triad management continue to work the arrangements necessary for N3B employees to participate in Triad's onsite testing program, which has been useful in the timely clearance of presumptive cases (see 10/23/2020 report).

Area G–Safety Basis: Last Friday, the safety basis approval authority for the EM Field Office approved the revised evaluation of the safety of the situation (ESS) for the PISA related to fuel pool fire depth (see 7/17/2020 report). N3B's original ESS submittal was rejected in September on the basis of insufficient detail on operational restrictions (see 9/11/2020 report). In the revised ESS, N3B proposes maintaining the existing compensatory measure that reduces the amount of liquid fuel allowed in defined areas. They will provide a more detailed thermal analysis in a Justification for Continued Operations planned to be submitted in February 2021.

Safety Basis: Last week, Triad safety basis management sent the NNSA Field Office for review and approval a revision to the institutional procedure for the Unreviewed Safety Question (USQ) process. This revision addresses previous comments from the field office (see 5/8/2020 report). Notably, this revision translates the DOE guidance of "hours to days, but not weeks" related to processing new information to declare a PISA to 9 working days. This represents a tightening from the current expectation of 15 days. Triad similarly tightened the expectations for PISA to USQ to 11 working days (from 15) and USQ to ESS to 25 working days (from 30). The lack of clear requirements for the PISA process was the subject of a letter from the Board dated July 10, 2020.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 27, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending November 27, 2020

Area G–Readiness: Last Friday, the contractor readiness assessment team for the glovebag and drill & drain operations paused the review due to operational impacts from a presumptive case of COVID-19 with multiple close contacts. The team out-briefed its interim results and plans to complete necessary field demonstrations and an emergency drill in December pending COVID-19 conditions. The team’s interim results included eight pre-start findings involving: flow-down of criticality safety requirements; design and configuration management issues with the installed glovebag; ability to respond to a fire during glovebag operations; lack of defined compensatory measures associated with phasing out of the startup plan; procedural issues; lack of evaluation of lighting levels to support safe glovebag operations; and deficiencies with the radiation protection review. The team also identified a post-start finding associated with inadequate closure of issues identified during the management self-assessment.

Infrastructure: Earlier this month, Triad safety basis management transmitted to the NNSA Field Office for review and approval a significantly revised major modification determination and safety design strategy for the Los Alamos Plutonium Pit Production Project (see 8/21/2020 report). The revisions address previous comments from the field office that generally improve the level of detail and analysis in the documents; however, the overall conclusion remains that the LAP4 effort does not constitute a major modification. Of particular interest, the documents provide better granularity on the expected changes to material-at-risk. They note an expected increase in the quantity of plutonium metal and a decrease in the quantity of plutonium oxide compared to the current safety basis. The reduction in oxide is expected to result in overall lower dose consequences for the bounding postulated accident scenario of a seismically-induced fire. The need to protect the apportionment of material-at-risk assumed in the safety analysis was discussed in the report attached to the Board’s letter dated November 15, 2019, concerning the safety basis for the Plutonium Facility. The field office is reviewing the submittal.

Weapons Engineering Tritium Facility: Triad safety basis personnel concluded they had a deficient safety basis (i.e., a positive unreviewed safety question) related to the setpoint for the oxygen monitoring system (see 11/20/2020 report).

Plutonium Facility–Safety Basis: On Thursday, the NNSA Field Office unconditionally approved Triad’s evaluation of the safety of the situation concerning the criticality alarm system (see 8/28/2020 report).

COVID-19 Impacts: Contractor and field office management continue to emphasize the need to maximize telework. For next week, Triad management intends to implement a slow, deliberate return to work that keeps onsite staffing at an absolute minimum following the holiday weekend.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 4, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending December 4, 2020

Radiological Laboratory Utility Office Building (RLUOB): Last Monday, Triad submitted a safety basis implementation plan to the NNSA Field Office describing their planned approach to implementing the new safety basis for the upgrade of RLUOB to a hazard category 3 nuclear facility referred to as PF-400. The process is anticipated to include a major implementation verification review planned for April 2021. Following that review, facility personnel will implement technical safety requirements in two phases. The first, anticipated for July 2021, will occur prior to a management self-assessment, and includes all controls with the exception of the new, hazard category 3 material-at-risk limit. This final control will not be implemented until the facility has been approved as a hazard category 3 nuclear facility which is anticipated for March 2022.

Area G–Safety Basis: On Wednesday, N3B transmitted to the EM Field Office the results of their extent of condition review for unsupported assumptions in the Area G safety basis and supporting calculations associated with design basis accidents involving fire. The other accidents will be completed in March 2021. The field office directed this review following the discovery of an error in a fuel pool fire calculation (see 7/17/2020 report). The extent of condition for the fire accidents found numerous weaknesses and recommended that new control selection be performed to determine correct mitigated frequencies and consequences for these events. N3B personnel have also entered their initial confirmatory process for many issues identified during the extent of condition to determine if these errors constitute potential inadequacies of the safety analysis.

Plutonium Facility–Conduct of Operations: On Monday, three workers entered a room that was “red lit” to restrict access due to a continuous air monitor alarm that had occurred on the prior Friday. Fortunately, radiological control technicians had indications that the alarm had been false, and there was no evidence of an uptake. On Wednesday, facility personnel convened a fact-finding to learn from this near-miss. Fact-finding participants noted that the permanent red light was inoperable, a portable red light had depleted its battery, and a barrier tape had been incorrectly installed across the door frame. Accordingly, the workers indicated they had not realized they were crossing a barrier. Participants also noted that the workers had entered this room from a side door. All such side doors in the facility display a posting directing workers to consult the primary door posting prior to entry. In this case, the workers did not adhere to the posting and consult the primary door, which would have alerted them to the red lit status of the room. Triad management determined that corrective actions were necessary to reinforce expectations regarding door postings, review preventive maintenance for the lights, and explore the use of long-life light bulbs.

Transuranic Waste Management: On Tuesday, Triad safety basis personnel entered their New Information process concerning a potential for chemical incompatibility hazards in waste containers. They entered in response to information contained in DNFSB/TECH-46, *Potential Energetic Chemical Reactions Involving Transuranic Waste at LANL*, issued on September 24, 2020.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 11, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending December 11, 2020

Transuranic Waste Management: Last Thursday, N3B management declared a potential inadequacy of the safety analysis (PISA) based on a review of information contained in DNFSB/TECH-46, *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at LANL*, issued on September 24, 2020. The PISA notes that the Area G safety basis does not explicitly evaluate a transuranic waste container with unreacted incompatible chemicals or one for which the contents are unknown. Further, such an analysis would need to reflect higher energy events that could impact the magnitude of the release and resulting radiological consequences. In late September, N3B personnel completed an initial review of the aboveground inventory based on information in TECH-46. They took action to overpack containers and place them in the Dome 375 Perma-Con—a location that includes non-credited confinement ventilation, fire suppression, and continuous air monitoring. N3B personnel continue an extent of condition review of the inventory to identify other containers of concern and are developing a shift order to communicate storage and management controls for other containers with the potential for incompatible materials. Triad personnel continue to work through their New Information process concerning TECH-46 implications (see 12/7/2020 report).

Area G—Readiness: Three members of the contractor readiness assessment team evaluating Glovebag and Drill & Drain operations in the Dome 231 Perma-Con returned to complete their review (see 11/27/2020 report). A presumptive COVID case and related self-isolations paused field operations during the first phase of the review. The presumptive individual received a negative test clearing personnel to return to duty. N3B rescheduled an additional operational demonstration and an emergency drill for this week. The team's second out-brief to N3B on Tuesday noted that the additional observations this week did not result in any new findings or changes to those outlined in the interim out-brief two weeks ago. A federal readiness assessment will follow next year.

Radiological Laboratory Utility Office Building (RLUOB): On Monday, the NNSA Field Office transmitted a letter to Triad directing several actions to be taken as part of the transition of RLUOB to a hazard category 3 nuclear facility to be known as PF-400. The letter notes that there are ambiguities in the code of record for RLUOB supporting the transition to a nuclear facility. Therefore, NNSA directed Triad to develop a plan within 30 days to complete specific actions to address this situation including updating their list of applicable codes and evaluating gaps between current codes and previous codes used for the facility's construction. The Board noted a similar concern in a letter to the Secretary of Energy dated December 8, 2020.

Waste Characterization Reduction and Repackaging Facility: Last Thursday, the NNSA Field Office approved a safety basis addendum to support characterization and removal of a drum of unconfirmed contents in the facility (see 1/18/2019 report). The addendum requires the use of a webbing-type lid restraint during handling of the open overpacked drum until flammable gas measurements demonstrate that deflagration is no longer a concern.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 18, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending December 18, 2020

Plutonium Facility–Safety Basis: Last Friday, Triad safety basis management transmitted to the NNSA Field Office a revision to the evaluation of the safety of the situation (ESS) associated with the trailer loaded with combustibles parked in proximity to transuranic waste containers (see 10/16/2020 report). The field office had requested analysis for common combustibles and any additional controls that may be required for common combustibles. The revised ESS continues to assert that the consequences from a pool fuel fire bound those of any credible common combustible fire and therefore no additional credited controls are necessary. The ESS does commit to explicitly adding the outdoor pad to the scope of the key element of the fire protection program. DOE-STD-3009-2014 articulates the need to analyze hazards that have their own unique control set even if the consequences are bounded by other similar hazards. In this case, the controls from a fire involving common combustibles are clearly different from those used for a fuel pool fire. The ESS is informational and does not require field office approval.

Management–Abnormal Event Notifications: On Tuesday, Plutonium Facility personnel conducted a fact-finding for a glovebox window that incurred damage during operations on November 2. The work team had taken appropriate actions during the event and fact-finding participants identified corrective actions to help prevent recurrence. This event did not receive a formal abnormal event notification. Triad’s institutional command media for performance improvement from abnormal events no longer includes criteria for minor incidents warranting internal abnormal event notifications. We continue to believe that appropriate use of this system aids tracking, trending, and supports overall organizational learning (see 9/6/2019 report).

Plutonium Facility–Readiness: On Thursday, Triad convened their Joint Evaluation Team to evaluate the proposed readiness plan for a new cabinet radiography unit. They concluded that the new equipment is substantially similar to previous operations and is therefore an expansion of existing capability not requiring a formal readiness review. Triad will perform a management self-assessment prior to startup.

Transuranic Liquid Waste Treatment Facility Project: On Wednesday, Triad submitted to the NNSA Field Office for approval a revision to the safety design strategy and preliminary documented safety analysis. This submittal is intended to resolve comments from NNSA’s earlier rejection of a safety design strategy (see 7/24/2020 report). The safety analysis is based on the 90% design revision and will be revalidated with the final design submittal.

Management: Triad issued their Laboratory Agenda for fiscal year 2021. This document establishes the laboratory’s priorities in alignment with NNSA policy. Goals for this year are similar to last year’s with pit production being a top nuclear security priority. Improving waste management, nuclear criticality safety, and nuclear safety are among the mission operations priorities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 25, 2020

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending December 25, 2020

Transuranic Waste Management: Last Thursday, Triad management declared potential inadequacies of the safety analysis (PISA) at the Plutonium Facility, the Chemistry and Metallurgy Research building, and the Transuranic Waste Facility. The PISAs were based on a review of information contained in DNFSB/TECH-46, *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at LANL*, issued on September 24, 2020. Specifically, the PISAs identify that the hazard presented by the potential for nitrated anion exchange resins in transuranic waste drums is not analyzed in the safety bases for these facilities. Triad's analysis notes that current resin operations use small quantities (larger scale anion exchange processes remain authorized in the Plutonium Facility, though are not currently operating) and procedural controls are in place to ensure rinsing. TECH-46 cited the resins as one example of a potential chemical incompatibility. Triad's analysis focused exclusively on this example, but they commit to perform an extent of condition for the existing and proposed waste streams to identify other potential chemical incompatibilities. This contrasts with N3B's approach to its PISA for Area G that assumes the potential for incompatible chemicals exists and must be further evaluated (see 12/11/2020 report).

Area G–Safety Basis: On Monday, N3B declared four PISAs. These all stemmed from the recent extent of condition review of design basis accidents involving fire hazards at Area G (see 12/4/2020 report). The PISAs are: (1) the vehicle accident with fuel pool fire may not be representative and bounding of all accident sequences, (2) the fuel pool fire from a container leak accident may not be representative and may not have appropriate controls and risk reduction, (3) the refueling vehicle accident with pool fire has an incomplete analysis that is not bounding and representative, and (4) the vehicle accident with combustible fire may have inappropriate controls applied to its unique sequence of events. N3B personnel are still evaluating issues from the extent of condition to determine if additional PISAs will be recommended. Presently, Area G operations are curtailed and the facility is in a safe condition as compensatory measures for planned activities are developed.

Plutonium Facility–Radiological Control: Last Thursday during a hot job to replace a valve in a contaminated system, multiple continuous air monitors alarmed in a laboratory room. The workers were in respiratory protection and exited the area while covering the equipment to mitigate potential contamination spread. One worker's personal protective equipment was contaminated, but there was no skin contamination or evidence of an uptake. The room remains under restricted access until recovery is completed.

Flanged Tritium Waste Containers: Last Thursday, Triad issued their corrective action plan for the findings and other issues identified by the federal readiness assessment for venting and handling activities at Area G (see 11/13/2020 report). Triad also completed a causal analysis to evaluate the findings from the readiness assessment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 1, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending January 1, 2021

The Year on a Page: A summary of the key developments of 2020.

- Triad and N3B implemented a control set and an onsite testing program to allow some programmatic and construction activities to continue during the COVID-19 pandemic.
- Triad personnel completed contractor and federal readiness assessments of the planned activity to vent and relocate the four Flanged Tritium Waste Containers stored in Area G. In 2016, safety basis personnel determined that these containers have the potential for flammable headspace mixtures. Triad plans to execute the venting activity in 2021.
- In June, Plutonium Facility personnel experienced a glovebox glove breach involving heat-source plutonium that resulted in personnel intakes and room contamination. Triad's investigation revealed the need to strengthen the glovebox glove integrity program and execute many other corrective actions.
- Plutonium Facility personnel completed the final upgrades needed to credit the new electric firewater pumps to safety class status. They continue efforts to ensure in-facility piping meets seismic demands and eliminate fragile facilities from the water supply loop.
- Triad completed its column capital testing program in support of the ongoing studies of the seismic performance of the Plutonium Facility. The test results found that the facility's column capitals will perform as designed during an earthquake. This result provides a necessary input to the nonlinear dynamic analysis, which should provide a final answer on the structure's performance and is expected to be completed in 2022.
- Triad completed 36 shipments of transuranic waste to the Waste Isolation Pilot Plant, including 34 that used the RANT Shipping Facility. N3B completed 17 shipments of transuranic waste. Six of these shipments went through the RANT Shipping Facility per a new agreement allowing legacy waste shipments to use the NNSA facility. In total, more than 1500 containers were shipped offsite in 2020.
- Triad and N3B each declared potential inadequacies of the safety analysis in response to DNFSB/TECH-46, *Potential Energetic Chemical Reactions Involving Transuranic Waste at LANL*. They will continue executing their respective processes to remedy the impacted safety bases and implement additional controls, as determined to be necessary.
- Triad received approval for the safety basis to upgrade the Radiological Laboratory Utility Office Building from a radiological facility to a hazard category 3 facility to be termed Plutonium Facility, Building 400. They continue a multi-year effort to resolve fire protection deficiencies in parallel with commencing the readiness review process.
- The EM and NNSA Field Offices gained new managers, continued to acquire needed staff, and underwent assessments from their headquarters organizations revealing the need to strengthen some key aspects of their federal oversight.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 8, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 8, 2021

Area G–Safety Basis: On Thursday, N3B management declared three additional potential inadequacies of the safety analysis (PISA) after further investigating concerns identified by its robust extent of condition review on fire related accidents (see 12/4/2020 report). They plan to finalize compensatory measures by next Monday. N3B management also declared two additional PISAs late last month after the EM Field Office rejected a September 2020 request to extend two safety basis documents for other longstanding PISAs. N3B suspended the affected operations when these two documents expired in November 2020. This week, N3B safety basis personnel commenced the second phase of the extent of condition review on the existing Area G safety basis.

These five declarations bring the total number of PISAs that originated in calendar year 2020 against the Area G safety basis to 17. While the PISAs indicate a healthy scrutiny of the safety basis, N3B and EM have struggled to efficiently develop, approve, and implement the required safety basis documents to ensure safety and support the important risk reduction mission at Area G. For example, N3B declared a PISA in January 2020 regarding the use of a spatula-like tool that occluded drum vents during headspace gas sampling (see 1/31/2020 report). This PISA remains without an approved safety basis due to issues with the initial submittal (see 9/11/2020 report) and protracted approval cycles within EM (Field Office and Headquarters). Flammable gas sampling operations remain paused eliminating this specific concern, but the pause also hinders N3B's ability to ensure that waste containers can be certified for permanent disposal. N3B and EM management are starting various initiatives to improve the situation.

Plutonium Facility–Criticality Safety: Last month, Triad nuclear criticality safety personnel issued a memo regarding the credibility of fissionable solutions leaking from the aqueous chloride processing room on the first floor into the basement during normal operations and following a seismic event. This evaluation was a corrective action from an event in November 2018 where an overflowing restroom sink led to water ingress into the facility's basement. This leak was similar to an earlier incident (see 3/16/2018 report). The concern is that there are no criticality safety controls in the basement for large volume geometries, including structural aspects (sumps) or transient items (voluminous equipment). The memo concludes that fissionable solutions cannot credibly enter the basement, since the solutions are contained in gloveboxes during normal operations and the building remains "intact" following a seismic event. Criticality safety personnel plan a future evaluation of leaks from the aqueous nitrate processing areas. Those areas are not currently in operation, but pose challenges of larger fissionable liquid volumes and tanks external to gloveboxes. Facility management is currently evaluating the bases for supporting the conclusion that there could be no leakage through the floor and examining the process to develop the memo.

Weapons Engineering Tritium Facility: On December 22, 2020, Triad management transmitted to the NNSA Field Office for approval the ESS concerning the oxygen monitoring system setpoint (see 11/20/2020 report). The ESS notes that facility personnel have adjusted the oxygen setpoint to 2.6 percent to ensure consistency with the current applicable National Fire Protection Association standard.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 15, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 15, 2021

Transuranic Waste Management: On Thursday, Triad and N3B personnel completed the first shipment of co-mingled transuranic waste from the RANT Shipping Facility to the Waste Isolation Pilot Plant. The shipment contained 24 drums of legacy waste managed by N3B along with 4 drums of newly generated waste from Triad operations. This is a significant development—preparing shipments of co-mingled wastes allows the DOE to optimize payloads thereby reducing the number of empty dunnage drums that are sent and emplaced in the Waste Isolation Pilot Plant.

Plutonium Facility—Operations: Last Monday, workers performing practice runs in preparation for the eventual restart of aqueous nitrate operations noted a cloudy solution after running water through the system. While running the solution through a filtration unit, the workers obtained an unexpected semi-solid accumulation upon which they paused and reported the discovery. Aqueous nitrate operations have been suspended since the LANL Director paused operations in 2013, and there is known holdup in some of the equipment. The work crew was operating using an integrated work control document that allowed operations with a plutonium mass limit of 50 g; however, the total estimated plutonium holdup in the tank was about 70 g. Both values are well below the criticality safety limits for the process. The precipitate will be analyzed for plutonium content which is expected to be well below 50 g. Restart of aqueous nitrate operations is currently planned for fall 2021.

Plutonium Facility—Infrastructure: Last month, Triad management transmitted the annual revision of the TA-55 Project Execution Strategy (PES) to the NNSA Field Office for information (see 1/10/2020 report). For last fiscal year, the PES reports key accomplishments including: completion of the column capital testing program; installation of 37 new fire doors and fire barriers for certain duct penetrations; commissioning of the diesel electric generators for the electric firewater pumps; completion of three fire hazard evaluations; progress with the design to resolve the cast iron fitting issue with the sprinkler piping; and completion of seismic analyses for 41 gloveboxes. For this fiscal year, the PES recommends actions including: continued seismic analysis of the instrument air system; additional fire barrier modifications; completion of the new chlorine gas delivery system; continued seismic analyses and fire hazard evaluations for gloveboxes; and completing the design for the new facility control system.

Plutonium Facility—Criticality Safety: On Tuesday, Nuclear Criticality Safety management rescinded the memo that examined the potential for solutions of fissionable liquids to leak into the basement (see 1/8/2021 report). A new approach for this evaluation is under development.

COVID-19 Impacts: On Wednesday, Triad management paused radiological work inside enclosures within the Radiological Laboratory Utility Office Building Due to a presumptive COVID-19 case that impacted staffing within the facility's operations center. Despite this case, the lab has generally experienced a decline in incidents with large numbers of close contacts. Last week, Triad commenced vaccination of the laboratory workforce in accordance with New Mexico Department of Health policy.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 22, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 22, 2021

Transuranic Waste Management: On Thursday, N3B management transmitted to the EM Field Office for approval its evaluation of the safety of the situation (ESS) for the potential inadequacy of the safety analysis concerning DNFSB/TECH-46 (see 12/11/2020 report). The ESS proposes compensatory measures for transuranic waste containers that are identified to have incompatible chemicals or unknown contents. The compensatory measures include overpacking or placing a lid restraining device on the container and moving the container to the Dome 375 PermaCon. The ESS notes that N3B plans to submit a justification for continued operations within 90 days of the field office approving the ESS. The field office is reviewing.

Plutonium Facility–Infrastructure: On Thursday, the NNSA Field Office transmitted comments and direction to Triad management regarding the previously submitted revisions to the major modification determination and safety design strategy for the Los Alamos Plutonium Pit Production Project (LAP4) (see 11/27/2020 report). The field office direction, which was informed with formal advice from NNSA's Chief of Defense Nuclear Safety, notes that several of the screening criteria for determination of a major modification to the safety basis should have been tripped in accordance with DOE-STD-1189-2016, *Integration of Safety into the Design Process*. In particular, the field office noted that the design options for some of the installation activities may require relocation of interior walls and perturbing portions of the safety class confinement structure. Other significant comments include: improving discussions of material-at-risk changes to include integration of other potential mission work changes (i.e., Advanced Recovery and Integrated Extraction Recovery System); addressing interim conditions during construction; improving integration of safety basis deliverables with the parallel upgrade of the safety basis to comply with DOE-STD-3009-2014; and addressing the hazards associated with the removal of existing contaminated equipment.

In advance of this direction, Triad management chartered a safety-in-design integration team to revise the safety design strategy and submit an acceptable safety design strategy by February 24, 2021. The team began meeting last week and has held several discussions.

Last week, NNSA personnel conducted an integrated project review of LAP4 in advance of a critical decision-1 milestone planned for April 2021. The team's out-brief noted several preliminary concerns, including: adjusting the conceptual design to the major modification determination, including impacts to scope, cost, and schedule; strengthening integration across nuclear safety disciplines; insufficient code of record development for this stage of design; and an incomplete staffing analysis with unrealistic hiring assumptions.

Radiological Laboratory Utility Office Building (RLUOB): Last month, NNSA directed several actions to support upgrade of RLUOB to a hazard category 3 nuclear facility to be known as PF-400 (see 12/11/2020 report). On Wednesday, Triad submitted to the NNSA Field Office their response, including the plan for clarifying the RLUOB code of record. They plan to compare the existing code of record for RLUOB and determine any gaps with current codes and standards. The review is scheduled for completion in June 2021 to support a safety basis update in September 2021.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 29, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 29, 2021

DNFSB Staff Activity: On Monday, members of the Board's staff held a call with N3B and EM Field Office personnel to discuss their current approach to addressing items described in DNFSB/TECH-46, *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at Los Alamos National Laboratory*.

Flanged Tritium Waste Containers (FTWC): On Thursday, Triad transmitted to the NNSA Field Office for approval their corrective action plan from the federal readiness assessment for FTWC venting and handling activities at Area G. They also provided evidence of completed actions including: an evaluation of how recommendations and observations from the contractor readiness assessment were dispositioned; promulgation of lessons-learned regarding instrument positioning for remote readability; and validation of the operating procedure to confirm compliance with the technical safety requirements. If NNSA agrees that the corrective actions are adequate, they will transmit them for final approval to the Office of Environmental Management who is the startup authority for this activity.

Plutonium Facility–Infrastructure: This week, NNSA and Triad personnel continued multiple safety design integration team meetings in support of developing an acceptable safety design strategy for the Los Alamos Plutonium Pit Production Project (see 1/22/2021 report). This week's focus topics included structural impacts, the ventilation system, and integration with the overall effort to upgrade the safety basis for the Plutonium Facility to DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*.

Transuranic Liquid Waste (TLW) Treatment Facility Project: Last month, Triad safety basis management transmitted to the NNSA Field Office for approval a revision to the preliminary safety basis and safety design strategy for the project. These revisions address field office comments on the versions submitted once project activities recommenced from suspension (see 9/22/2017 report). TLW will be a hazard category 3 nuclear facility that treats caustic and acidic transuranic liquid wastes resulting from production activities within, and subsequently transferred from, the Plutonium Facility. Significant changes include updating the requirements basis to DOE-STD-1189-2016, *Integration of Safety into the Design Process* from the 2008 version and DOE-STD-1228-2016, *Preparation of Documented Safety Analysis for Hazard Category 3 DOE Nuclear Facilities* from DOE-STD-3009-94-CN3, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*. The field office is reviewing the submittal.

Area G: N3B management recently declared two temporary stop works. One was taken in response to questions raised by safety basis personnel during the review of documents and the other was taken in response to a number of vehicle-related incidents.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 5, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 5, 2021

Transuranic Waste Management: On Wednesday, Triad management transmitted to the NNSA Field Office for approval three evaluations of the safety of the situation (ESS) concerning DNFSB/TECH-46 (see 12/25/2020 report). The ESSs note that anion exchange resins that have not been rendered nonreactive could result in a potential energetic chemical reaction that overpressurizes a waste container. The ESSs analyze the potential radiological consequences from this event using an effective respirable release fraction of 0.07 that results in unmitigated doses that challenge or exceed DOE's criteria for credited controls to protect the public and workers. The ESS for the Plutonium Facility notes that waste containers stored outside have no viable controls to mitigate a release. Accordingly, each ESS proposes a credited control to ensure that spent resin in excess of 150 mL in a single waste container is rendered nonreactive. The ESSs also note an ongoing extent of condition review to identify other potentially incompatible chemicals in waste; however, a schedule to complete that effort was not provided.

Federal Oversight: On Monday, DOE Office of Enterprise Assessments personnel out-briefed Triad and the NNSA Field Office on the results of their remote assessment of the Nuclear Criticality Safety Program. Overall, they concluded that the program has improved since the 2013 Director's pause and that the field office has been providing comprehensive oversight. The final report is expected to be completed by May 2021. The team is planning a second assessment focused on control implementation and conduct of operations once an in-person review is feasible.

Plutonium Facility–Material-at-Risk: On Tuesday, operations personnel suspended heat-source plutonium activities after discovering an error in the calculated elemental weight of plutonium during aqueous processing. Operations personnel performed initial calculations that suggest that no material-at-risk limits were exceeded; however, heat-source activities will remain suspended until a formal validation of the material-at-risk is completed.

Area G–Safety Basis: On Monday, the DOE Office of Environmental Management rejected the latest iteration of N3B's approach to upgrade the safety basis for Area G (see 9/18/2020 report). The rejection letter noted that the safety basis strategy submitted at the end of October 2020 did not provide adequate information to balance upgrading the safety basis while managing issues with the existing safety basis that supports current operations.

Weapons Engineering Tritium Facility: On Thursday, facility operations personnel discovered that a tritium room monitor had failed overnight due to loss of flow. They took the required safety basis actions and were later able to restore operability to the unit. These monitors are old and the facility has experienced several of these failures in the past few years. Consequently, facility personnel are already in the process of replacing the units and expect to complete the effort in the next month. On Monday, the NNSA Field Office approved Triad's ESS concerning the oxygen monitoring system (see 1/8/2021 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 12, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 12, 2021

DNFSB Staff Activity: On Wednesday, members of the Board's staff conducted a web conference with Triad and NNSA Field Office personnel to discuss the combustible trailer formerly parked adjacent to an outside transuranic waste storage pad at the Plutonium Facility (see 12/18/2020 report).

Area G—Safety Basis: Last Friday, the EM Field Office approved the evaluation of the safety of the situation (ESS) concerning the use of a spatula-like tool during headspace gas sampling (see 9/11/2020 report). N3B intends to submit a justification for continued operations within 30 days, which is necessary to restore gas sampling operations that have been impacted since January 2020. Last week, N3B operations management implemented a standing order that consolidated compensatory actions associated with 16 ESSs from the safety basis issues identified last year (see 1/8/2021 report). The extent-of-condition review on the existing safety basis continues.

Transuranic Waste Management: N3B personnel continue their extent-of-condition review of the waste container population concerning DNFSB/TECH-46. Recently, they identified four containers with ion exchange resins and seven containers with unknown absorbents—all were treated as containing potentially incompatible chemicals consistent with the recently submitted ESS and moved into the Dome 375 PermaCon (see 1/22/2021 report).

On Wednesday, Triad personnel transported a shipment of 28 containers of cemented transuranic waste to Area G. N3B and Central Characterization Program personnel will conduct non-destructive examination activities on these containers for Triad. Currently, Triad relies exclusively on visual examination to fulfill the non-destructive examination requirements and does not possess radiography capability appropriate for cemented waste forms or standard waste boxes. This is the first instance that Triad has exercised the service agreement with N3B to send newly generated wastes to Area G for storage or services.

Onsite Transportation: Last Thursday, the NNSA Field Office conditionally approved Triad's ESS for the shipment of pyrophoric materials not being addressed in the onsite Transportation Safety Document (see 9/18/2020 report). The ESS states that shippers will attempt to validate that shipments labeled 'solid metal' of less than 50 grams are actually solid metal rather than potentially pyrophoric turnings. If they are unable to conclusively determine that the shipment does not contain potentially pyrophoric material, it will not be shipped without further evaluation. The ESS also states that pipe overpack containers may be used to transport potentially pyrophoric metals with masses less than 50 grams. As a condition of approval, the field office noted that there is no documented basis demonstrating the adequacy of a pipe overpack to contain such material and therefore prohibited transport until a basis is approved. The Transportation Safety Document will be updated in the future to allow transportation of pyrophoric materials when contained in Type B equivalent packages.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 19, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 19, 2021

Area G–Safety Basis: On Tuesday, the EM Field Office rejected the evaluation of the safety of the situation (ESS) concerning pipe overpack containers with greater than 80 plutonium-239 equivalent curies (see 7/17/2020 report). The field office noted that N3B has identified additional inadequacies with the accident scenario as part of its ongoing extent-of-condition review that occurred after the ESS was submitted in October 2020. Consequently, the field office could not approve the ESS without additional evaluation and discussion of the impacts of these inadequacies.

This week, N3B personnel conducted fact-findings for two additional potential inadequacies of the safety analysis (PISA) resulting from their ongoing extent-of-condition review. The first PISA involved postulated single container deflagrations and identified that the controls are irrelevant to the accident scenario. The second PISA involved postulated dropped transuranic waste payloads during TRUPACT II mobile loading operations and identified discrepancies with the assumed material-at-risk and credited controls. N3B management identified compensatory measures to be implemented through shift orders and eventually integrated into a revision of the standing order consolidating controls from many ESSs.

Plutonium Facility–Conduct of Operations: Last Thursday, workers in the Plutonium Facility discovered a non-compliance in a dropbox while completing checks prior to performing a movement of nuclear material. They found an item had been moved into the box the previous day that exceeded the mass limit on the criticality safety posting for the location. Criticality safety personnel determined that the condition is bounded by the analysis in the criticality safety evaluation document for this operation. As a corrective action, the group that performed the movement of the item will use a more rigorous section of the material movement procedure. They also plan to hold a safety day to brief personnel on this event and how to avoid similar events in the future.

Plutonium Facility–Work Control: Last Tuesday, Plutonium Facility personnel performed activities without the knowledge of operations center personnel. At the time, the laboratory room in question was in Standby mode per the Technical Safety Requirements following an earlier material-at-risk discrepancy (see 2/5/2021 report). The work being performed would have been allowed in this operations mode as it did not involve special nuclear material, and personnel believed they had received permission to perform the activity through a series of informal communications that lacked precision. Triad personnel have an ongoing effort to improve scheduling and work release processes.

Weather Impacts: Snowfall impacted onsite operations at the laboratory resulting in closure on Tuesday and a delayed start on Thursday.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 26, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 26, 2021

DNFSB Staff Activity: On Wednesday, a staff team conducted a web conference with Triad and NNSA Field Office personnel to discuss key inputs that will be used in the ongoing update of the leak path factor analysis supporting the safety basis for the Plutonium Facility. They also discussed the current process for managing transient combustibles within the facility and how that is tied to safety basis assumptions regarding fire behavior.

Area G–Safety Basis: On Monday, N3B personnel declared two additional potential inadequacies of the safety analysis (PISA) as a result of the second phase of their extent of condition review of the safety basis (see 2/19/2021 report). The first PISA relates to excessive frequency reduction applied to a spotter control to prevent a crane from impacting waste drums. As a compensatory measure, mobile crane operations are currently paused in Area G. The second PISA is due to an incomplete frequency analysis of the mitigated event for a forklift tine puncture of an unvented or recently vented waste drum. As a compensatory measure, forklift activities now require a spotter.

Safety Basis: Last week, Triad safety basis management transmitted to the NNSA Field Office a revised protocol to perform calculations of atmospheric radionuclide dispersion for safety basis applications. The revision incorporates updated meteorological data and addresses outstanding field office comments (see 11/3/2017 report) including a justification for the use of linear plume meander and questions regarding the potential to concentrate releases in canyon topography. Triad did not request approval, but the NNSA Field Office intends to provide comments to be considered in future applications of the protocol. Consequently, the current approach results in a case-by-case approval as part of the field office's review of future safety basis submittals.

Plutonium Facility–Infrastructure: On Thursday, Triad safety basis management transmitted to the NNSA Field Office for approval a complete rewrite of the safety design strategy (SDS) for the Los Alamos Plutonium Pit Production Project. This SDS revision addresses NNSA direction to treat the project as a major modification to the safety basis (see 1/22/2021 report). The SDS presents an approach to identify project scope requiring preliminary documented safety analysis coverage and proposes these will take the form of safety basis addenda to avoid duplication with the existing safety basis. The project will develop safety basis addenda for a new radiography system, a final assembly station, and parts staging gloveboxes. The SDS also provides design upgrade analyses for interface with the existing safety systems associated with the criticality alarm, fire suppression, gloveboxes, site paging, and ventilation. To address DOE requirements concerning active confinement ventilation, the SDS includes a discussion on the active and passive confinement systems currently in use at the facility. The SDS asserts these existing systems meet requirements, but note that an ongoing series of incremental projects are being executed with the ultimate goal of achieving a safety-class active confinement ventilation. NNSA's most recent report to Congress indicates the need date for the completion of these projects is 2025; however, we note that NNSA has not established a date when an implemented safety basis will reflect this upgraded configuration for the enduring facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 5, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 5, 2021

DNFSB Staff Activity: On Wednesday, a staff team conducted a series of web conferences with personnel from EM Headquarters, the EM Field Office, and N3B to discuss current issues with the safety basis for Area G and the approach to assure safe operations while developing a modern safety basis.

Transuranic Waste Management: Last Friday, Plutonium Facility workers observed sparks while drumming out transuranic waste. They followed proper procedure and left the room, pulled a fire alarm, and contacted the operations center. Fire department personnel responded and determined that no fire condition existed. Triad's subsequent evaluation indicated no obvious damage to the glovebox, no release of radioactive material, and no injuries to the workers present at the time.

On Monday, Triad personnel conducted a fact-finding for this event. Attendees discussed the fact that the waste being disposed of included filters from an inert atmosphere glovebox used to weld non-radioactive metals including titanium alloy. Consequently, the group believes the likely explanation for the event was that metallic welding condensates on the filters underwent a pyrophoric reaction when a different waste item was added to the drum and breached a bagged filter allowing the influx of oxygen. Triad management: paused waste bag-out operations associated with materials from the welding gloveboxes; commenced a review of the waste records to determine if these filters exist in waste containers elsewhere at the laboratory or at the Waste Isolation Pilot Plant (WIPP); and entered the New Information process to determine whether the safety basis properly considers this energetic chemical reaction.

We note that this energetic chemical reaction underscores the need for Triad to fully address the concerns outlined in DNFSB/TECH-46 (see 12/25/2020). To date, Triad has identified and taken action for potential energetic reactions associated with cellulosic materials and ion exchange resins. They have also recently begun an extent-of-condition review to look for other potentially incompatible waste constituents; however, this search will be challenging because most of the waste from the facility falls under a single waste stream. For example, WIPP produced a chemical compatibility evaluation for this stream that indicates that there are more than 100 primary chemicals and materials of concern present, as well as about 150 others found at insignificant levels. This evaluation identified titanium as a material of concern, but concluded that powdered forms do not exist in the facility or that actions would be taken to render it unavailable for adverse reactions.

Plutonium Facility–Radiological Control: On Wednesday, a worker alarmed the hand and foot monitor at the exit of a laboratory room. Responding radiological control technicians found all six individuals in the room with high levels of contamination on their personal protective equipment and three of them also had skin contamination. During decontamination activities, a continuous air monitor alarmed in the decontamination room. There was also a continuous air monitor alarm in the original laboratory room following egress of the workers. Facility management will hold a fact-finding next week.

Safety Basis: Last month, Triad transmitted to the NNSA Field Office the 2021 annual update to the safety basis for the RANT Shipping Facility. This is the first annual update produced at LANL where such updates no longer require federal approval under the revision to 10 CFR 830, *Nuclear Safety Management*.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 12, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 12, 2021

DNFSB Staff Activity: Members of the Board's staff observed a briefing from Triad to DOE Headquarters and NNSA Field Office personnel covering planned changes to site specific atmospheric dispersion parameters used in safety analyses (see 2/26/2021 report).

Transuranic Waste Management: Triad personnel continued their efforts to identify waste containers with contents similar to those involved in the incident that occurred two weeks ago (see 3/5/2021 report). They identified potential containers at the Plutonium Facility, Transuranic Waste Facility (TWF), and the Waste Isolation Pilot Plant. They shipped the suspect containers from TWF back to the Plutonium Facility despite the ongoing issue with the transportation safety document concerning the lack of analysis for pyrophoric materials (see 2/12/2021 report). Triad personnel are finalizing calculations to determine the maximum potential mass of pyrophoric metal fines in these containers, the resultant impact on the waste container from an oxidation reaction with these metals, and the time required for these metal fines to passivate with oxygen diffusing through a plastic bag. NNSA and Triad leadership are determining an appropriate course of action for a formal investigation.

Area G: On Monday, N3B management notified the EM Field Office that they were immediately restricting operations at the facility to essential activities as a result of the large number of simultaneous safety basis issues (see 2/19/2021 report). These restrictions limit activities to those associated with surveillances required by the safety basis, environmental compliance, life safety, maintenance, and minimal essential movements of material-at-risk (MAR) needed to execute operational restrictions or other compensatory measures to support safety and compliance activities. In general, the most significant changes against the previous operational posture include suspension of MAR activities associated with planned open container remediation activities and container certification activities. The restrictions do not impact N3B's ability to mine and transport containers to the RANT Shipping Facility for offsite shipment. N3B also noted they will be providing a schedule for resolution of the safety basis issues to the EM Field Office by March 25, 2021.

Plutonium Facility–Infrastructure: On Wednesday, the NNSA Field Office approved the revised Safety Design Strategy for the Los Alamos Plutonium Pit Production Project (see 2/26/2021 report). There were no conditions of approval; however, the field office directed Triad to pursue an exemption for the vulnerabilities to the ventilation system per DOE O 420.1C, *Facility Safety*, as described in one of the options presented in the design upgrade analysis for the ventilation system.

Continuous Improvement: On Wednesday and Thursday, the Weapons Production Directorate held a safety stand-down for organizational learning, overlapping with a laboratory-wide re-emphasis on COVID controls. Senior management provided briefings on COVID controls and current operational concerns regarding radiological control, special nuclear material movement, waste management, and housekeeping, especially as related to combustible loading. Management is collecting input from small group breakout sessions where the workforce will discuss these concerns and methods for improving operations.

Weapons Engineering Tritium Facility–Readiness: On Thursday, Triad's Joint Evaluation Team recommended that a new operation involving testing plutonium coupons undergo contractor and federal readiness assessments. Safety basis changes analyzing the impact of adding plutonium to the facility are in progress.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 19, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending March 19, 2021

DNFSB Staff Activity: Members of the Board's staff held discussions with NNSA Field Office and Triad personnel as part of a review of the onsite Transportation Safety Document. The review examined adherence to applicable requirements, the completeness of the hazard and accident analyses, and the ability of the control set to ensure worker and public safety.

Transuranic Waste Management: On Monday, Triad personnel commenced an investigation for the event associated with the suspected titanium welding fume condensate that readily ignited into sparks during a waste drum-out (see 3/5/2021 report). The team's chartered outcomes include: (1) a comprehensive articulation of the facts and timeline, (2) an assessment of procedures governing the introduction of materials into the glovebox environment, (3) an assessment of the event response and recommendations for improvement, (4) a review of corrective actions taken in response to the radiological release event that occurred at the Waste Isolation Pilot Plant (WIPP) on February 14, 2014, and (5) a determination on the extent-of-condition regarding other processes that may be at risk of inadequate waste characterization. The team includes a mix of onsite and virtual participants from internal and external sources, including representatives from the Central Characterization Program (CCP) and the WIPP contractor. NNSA has assigned two observers. This week, the team walked-down the gloveboxes and locations within the Plutonium Facility that were involved in the waste generation and conducted a number of interviews.

Operationally, Triad has released most waste drum-out activities; however, CCP management has paused all characterization activities at the Plutonium Facility effectively meaning that no waste drum-outs can occur. Triad personnel have concluded that there are four containers at LANL with similar titanium welding fume condensates. These containers are isolated and within the Plutonium Facility confinement structure. No safety basis level restrictions or controls have been placed on the containers.

Area G–Safety Basis: On Tuesday, N3B submitted to the EM Field Office the second half of the extent-of-condition review of design basis accidents in the current Area G safety basis. During the course of this part of the extent-of-condition, seven issues were evaluated through the Initial Confirmatory process with four resulting in potential inadequacies of the safety analysis.

On Tuesday, the EM Field Office acknowledged N3B's letter describing their restricted operations (see 3/12/2021 report). On Wednesday, N3B transmitted to the EM Field Office for approval a revised safety basis strategy to update and upgrade the Area G safety basis. This revision is intended to address DOE comments from the previously rejected strategy noting that it did not include adequate information regarding managing safe operation of the facility while addressing the large number of issues with the current safety basis (see 2/5/2021 report). In their transmission letter, N3B noted that, per their restricted operations letter of last week, they would be providing an integrated plan for interim safety basis management by March 25, 2021. This plan is expected to detail a phased approach including development of a consolidated evaluation of the safety of the situation for a restricted operational envelope and additional analyses to support expanded operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 26, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director

FROM: J.W. Plaue and D. Gutowski, Resident Inspectors

SUBJECT: Los Alamos Activity Report for Week Ending March 26, 2021

Area G–Safety Basis: On Tuesday, N3B transmitted to the EM Field Office a consolidated evaluation of the safety of the situation (ESS) covering 18 of the potential inadequacies of the safety analysis (PISA) that were discovered between January 2020 and February 2021. These PISAs all resulted in positive unreviewed safety questions. The consolidated ESS summarizes the existing immediate compensatory measures for the 18 PISAs which were consolidated into a single standing order last month. This standing order in conjunction with the further restriction of operations enacted two weeks ago is intended to provide assurance that the facility is in a safe condition.

Also on Tuesday, N3B declared a new PISA related to the treatment of rotary wing aircraft crashes in the Area G safety basis. The calculation supporting the Area G safety basis does not include rotary wing aircraft impacts because of standoff distances imposed by a Triad site procedure. However, the standoff distances for local helicopter flights mandated by the Triad procedure are insufficient to preclude the possibility of a helicopter impacting facilities within Area G based on the glide path distances in DOE-STD-3014-96, *Accident Analysis for Aircraft Crash into Hazardous Facilities*. N3B personnel are revising their aircraft crash calculation and have notified their Triad counterparts.

On Wednesday, N3B personnel determined that an additional 10 waste containers should be treated as containing high fissile gram equivalents (see 3/6/2020 report). Facility operations staff have paused container movements, restricted access to the containers, and are working through a recovery process. Based on discussions at a fact-finding held on Thursday, these containers were re-assayed last year and the procedure used for reviewing the data had not been revised to reflect the changed approach of including measurement uncertainty for compliance with criticality safety limits.

Area G–Federal Oversight: Last summer, the DOE Office of Environmental Management’s Chief of Nuclear Safety completed the first phase of its assessment on nuclear safety functions at the EM Field Office (see 7/16/2020 report). The assessment identified significant weaknesses in the federal nuclear safety function as indicated by five management challenges (defined as a systematic problem) and five findings (defined as a violation of a requirement). Representative examples of each of these include: the field office has not ensured timeliness expectations are met for safety basis submittal and approvals; there is no demonstrated ownership of the field office safety basis documents; and the draft safety basis review procedure is non-compliant with DOE requirements. The field office accepted the team’s conclusions on July 30, 2020. As of this week, the EM Field Office reports about half of the corrective actions are complete and have begun working with EM Headquarters personnel to ensure the actions are adequate. As a compensatory measure for this continued situation, EM Headquarters continues to retain all nuclear safety approval authorities.

Transuranic Waste Management: Triad personnel continued the investigation into the titanium welding fume condensates that readily ignited during a waste drum-out (see 3/19/2021 report). This week’s activities largely consisted of interviews. The team’s charter requests a final report by April 23, 2021. Additional waste related developments include the discovery about a month ago of two containers with corroded filters similar to those that were replaced last summer (see 6/12/2020 report) and a facility-wide pause on liquid waste absorption activities due to questions from nuclear criticality safety.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 2, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plau and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 2, 2021

Plutonium Facility–Conduct of Operations: On Wednesday, a worker adding water to the vault water baths jammed open the spring-closed fill valve and departed for another task resulting in the baths overflowing. The local high-level alarm did activate; however, the alarm communication to the operations center did not function as intended. A radiological control technician discovered flooding in the vault corridor several hours later and reported the incident. The valve was promptly closed. Facility and criticality safety personnel concluded there was no immediate hazard from the estimated 1800 gallons of spilled water and started cleanup activities. There was no spread of radioactive contamination discovered during water sampling. Facility management has proposed many corrective actions to prevent recurrence including reviewing their alarms, evaluating an overflow line to a sump, and reviewing their fill procedure.

Plutonium Facility–Glovebox Safety: On Monday, workers performing hand lapping of a piece of plutonium metal breached a glovebox glove. The workers received contamination on their personal protective equipment, but there was no indication of an uptake. This was a repeat of an event that occurred last month (see 3/5/2021 report). Based on worker comments, it appears that corrective actions to improve tooling created a different sharps hazard. Management is reviewing the tooling.

Transuranic Waste Management: Last month, Triad safety basis personnel completed their New Information process related to the reactive titanium and tantalum metal fines that ignited and sparked during waste drum-out activities on February 26, 2021. For the Plutonium Facility, they entered the New Information process 5 days following the event. Fourteen days later, they completed the process. For the Transuranic Waste Facility (TWF), they entered the New Information process 10 days following the event and reached their conclusion 11 days later. Triad's procedure for its New Information process requires declaration of a potential inadequacy of the safety analysis (PISA) if a decision cannot be reached within 13 calendar days of entry into the process; however, Triad analysts received an internal variance to this requirement because of the one day safety stand-down.

Triad's analysis for both facilities concluded that a PISA did not exist, largely based on calculations demonstrating that reaction of the metal fines could not overpressurize or initiate a fire inside a waste container. The analysis for TWF also addressed whether the two containers that potentially contained reactive metal fines violated the safety basis prohibition on receipt of D001 (ignitable characteristic) waste. Safety basis personnel demonstrated compliance with the restriction using an email with an analysis from the division leader responsible for waste. The analysis indicated that any reactive fines placed in the waste container would have oxidized to a nonreactive state given the time elapsed since container closure.

Overall, Triad's analysis for the Plutonium Facility recommends improving discussion in the safety basis to explicitly describe the non-radioactive pyrophoric hazards (e.g., stainless steel, tantalum, titanium) in the welding and solid waste sections.

Area G–Safety Basis: On Monday, the EM Field Office rejected N3B's evaluation of the safety of the situation concerning DNFSB/TECH-46 (see 1/22/2021 report). The rejection noted the need to integrate with the other PISAs and provide a discussion on the safety of moving containers thought to have incompatible chemicals.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 9, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 9, 2021

Plutonium Facility–Safety Basis: On Monday, facility personnel took safety basis required actions after receiving information questioning whether they were appropriately accounting for encapsulated plutonium-238 heat sources in the calculation of material-at-risk (MAR). Specifically, personnel performing an extent-of-condition review on sealed-sources found that individual liners, rather than the full three-layer assembly, were being credited with a damage ratio of zero. While the liners have the testing and pedigree to support the use of this damage ratio, the safety basis has not yet fully implemented this control. Facility personnel removed the credit for the partial assemblies and satisfactorily performed the MAR surveillance on Wednesday. Facility management plans corrective actions related to the implementation verification review process and assignment of dedicated safety basis analysts for each programmatic operations group.

Transuranic Waste Management: On Monday, Plutonium Facility and Central Characterization Program (CCP) personnel resumed visual identification and examination activities in support of waste drum-outs. To resume these activities before the completion of the ongoing causal investigation into the reactive titanium fines (see 3/19/2021 report), waste management personnel instituted compensatory measures including: only processing waste streams from air atmosphere gloveboxes, implementing a new database to capture the date and location where waste packages originate, and providing training on newly revised policy documents. Meanwhile, the causal investigation team continued its efforts and remains on schedule to out-brief senior leadership next week. Notably, the team reviewed CCP requirements as the impact LANL waste characterization processes.

Weapons Engineering Tritium Facility: On Monday, facility operations personnel discovered that a tritium room monitor had failed during the weekend due to loss of flow. They took the required safety basis actions and were able to restore operability to the unit; however, the unit failed again later that day. This was the same unit that had failed earlier this year (see 2/5/2021 report). Discussion at the fact-finding centered around whether the issue was associated with the gas supply or the monitor itself. Based on a suggestion from an engineer, facility personnel swapped the monitor with another unit from a different room that had multiple monitors. This approach allowed them to isolate the problem between monitor and gas supply. On Wednesday, the swapped monitor also alarmed. Facility personnel further investigated and found a regulator for the gas supply that was set below the expected pressure. Facility management is using this experience to emphasize more comprehensive troubleshooting when safety systems malfunction.

Legacy Facilities: On Thursday, N3B received EM Field Office unconditional approval of the evaluation of the safety of the situation for the TA-21-257 radioactive liquid waste treatment facility and associated industrial waste lines (see 9/18/2020 report).

Federal Oversight: Last month, the NNSA Field Office issued its corrective action plan to address the Chief of Defense Nuclear Safety's biennial review of nuclear safety performance (see 10/16/2020 report). Field office leadership concluded that the issues are all low risk in accordance with their issues management process. As a result, none of the issues required a causal analysis. Corrective actions are scheduled to be completed by May 2022.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 16, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 16, 2021

Transuranic Waste Management: On Thursday, Triad's causal investigation team out-briefed senior laboratory leadership and multiple leaders from NNSA Headquarters on the results of their assessment of the sparking event involving reactive titanium metal fines. The team identified two root causes: (1) the programmatic operations group responsible for the welding activity did not recognize that welding titanium in an inert glovebox could result in the generation of potentially pyrophoric fume condensates and (2) neither Triad waste management nor Central Characterization Project processes rejected the prohibited reactive titanium metal fines from the transuranic waste stream. The team expects to release its full report next week with additional details, including a comprehensive barrier analysis and an event and causal factors tree. In our opinion, the second root cause and the associated contributing causes presented by the team demonstrate flaws in the corrective actions taken to enhance the acceptable knowledge program following the 2014 radiological release event at the Waste Isolation Pilot Plant.

Area G: This week, N3B and Triad personnel completed two shipments of legacy transuranic waste from the RANT Shipping Facility to the Waste Isolation Pilot Plant. Given the ongoing investigation on the titanium sparking event and the need for corrective actions, the Carlsbad Field Office has allocated Area G with all near-term planned shipments from LANL.

Flanged Tritium Waste Containers (FTWC): Triad and N3B personnel continue to work on corrective actions from last fall's federal readiness assessment associated with activities to vent and disposition the FTWCs with potentially flammable headspace conditions that are stored in a shed at Area G (see 1/29/2021 report). They are currently working to submit required safety basis changes, develop a case to conduct the activity under the limited operational envelope at Area G, and receive necessary regulatory approvals from the State of New Mexico. Given recent EM Field Office review and approval cycle times and the fact that Triad personnel will need to conduct additional practice and demonstrate those activities for DOE personnel, it will be challenging for Triad to conduct this important risk reduction activity prior to the start of the monsoon season. The radioactive decay of tritium increases FTWC pressures meaning that the continued delays increase the likelihood of an unplanned release to the environment.

Transuranic Waste–Safety Basis: On Tuesday, the NNSA Field Office rejected the three evaluations of the safety of the situation (ESS) related to spent ion exchange resins in waste containers associated with the Plutonium Facility, Chemistry and Metallurgy Research building, and the Transuranic Waste Facility (see 2/5/2021 report). The field office's rejection noted that Triad's supporting calculation does not provide an adequate basis to justify the conclusion that a small volume of unrinsed resin should be allowable in waste containers because it would not create a potential over-pressurization hazard. The rejection also noted that the evaluations do not identify procedures that render resins non-reactive through rinsing or cementation as safety controls. For the ESS specific to the Transuranic Waste Facility, the field office also noted that there are no controls associated with safely moving a container out of the facility that is noncompliant with the resin requirements—which is currently a required safety basis action.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 23, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 23, 2021

Safety Basis: In March, N3B declared a potential inadequacy of the safety analysis (PISA) at Area G because the safety basis had dismissed helicopter crashes as insignificant without a site-specific analysis (see 3/26/2021 report). In early April, N3B concluded the PISA constituted a positive unreviewed safety question (USQ) based on affirmative answers to four of the seven evaluation questions. Triad facilities use a variety of approaches to analyze helicopter crashes. The RANT Shipping Facility, which is adjacent to Area G, also does not evaluate helicopter crashes in the calculations supporting its safety basis. After receiving information from N3B about its PISA, Triad did not enter its New Information process to formally evaluate whether any of its facilities warranted entry into the PISA process for this issue. On Tuesday, Triad safety basis personnel briefed NNSA Field Office personnel on their arguments for not formally evaluating this matter. The field office requested Triad provide a written explanation of its analysis.

On a related note, last month the Facility Representative for the EM Field Office issued N3B a finding against DOE guidance associated with the PISA process. The finding cited: N3B did not make multiple PISA determinations in the expected timeframe of “hours to days;” and noted that documentation associated with multiple PISA determinations included more analysis than the expected “go/no-go” for this step in the process. We note that Triad safety basis personnel have a demonstrated record of these same practices.

Plutonium Facility–Construction Safety: Triad management paused backshift construction activities after two injuries last week: (1) a worker suffered a broken hand when a wind gust closed an unsecured transportainer door that smashed into the hand and (2) a worker received lacerations to the hand from an inadvertent actuation of a saw during practice downsizing operations in a glovebag in a non-radiological area. Fact-finding personnel discussed several concerns including: improper emergency notifications and associated conflicting direction on notifications; the need for additional onsite support personnel during backshift operations; the lack of drills and exercises to ensure readiness of the backshift for emergency events; and consideration of abnormal operating procedures to protect personnel working outside of the facility during high-wind conditions. Triad management is reviewing and individually releasing work packages for the backshift. We note that neither the NNSA Field Office nor the local NNSA Acquisition and Project Management Office have routine federal presence on the backshift.

Emergency Management: On Monday, the NNSA Field Office directed Triad to create a plan of action within 45 days to address the recurrence of improper emergency notifications. To support its argument, the field office cited seven instances of improper notifications since February 2020. The two construction safety injuries discussed above were not included in the tally.

Area G: On Wednesday, EM rejected N3B’s justification for continued operations associated with flammable gas sampling (see 1/8/2021 report). The rejection letter from the field office commits to provide detailed written comments to N3B no later than May 6, 2021. On Thursday, EM Headquarters and Field Office personnel discussed with N3B their concerns with the submittal. Flammable gas sampling operations have been suspended since January 2020.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 30, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 30, 2021

Plutonium Facility–Infrastructure: On Tuesday, the Deputy Secretary of Energy approved the Critical Decision 1 milestone (Approve Alternative Selection and Cost Range) for the Los Alamos Plutonium Pit Production Project. The Critical Decision 2 milestone (Approve Performance Baseline) is expected in 2023, and overall project completion is projected for 2027–2028. Triad also announced the creation of a new Associate Laboratory Directorate for Plutonium Infrastructure. This organization will be responsible for preparing the Plutonium Facility to meet its enduring programmatic missions through the execution of a multitude of efforts including: the pit production project, remaining subprojects from the Chemistry and Metallurgy Research Replacement Project, phase 3 of the Technical Area 55 Reinvestment Project, and other infrastructure efforts executed through programmatic funding.

Area G: Last week, N3B personnel identified two new potential inadequacies of the safety analysis (PISA). Personnel developing a modern documented safety analysis for the facility identified an inconsistency between the guidance in DOE-STD-5506-2007, *Preparation of Safety Basis Documents for Transuranic Waste Facilities*, and the construction classification of waste storage domes. The current safety basis considers the uncredited domes and Permacons to be light construction—meaning that if they collapsed, falling structural pieces will not damage waste containers and result in a release of radioactive material. The PISA notes that steel support trusses in some of the domes and Permacons are significantly heavier than the aluminum framework and may not be appropriately considered as light construction. A similar question came up two years ago following heavy snowfall which damaged some of the domes, but did not lead to a PISA (see 1/11/2019 report).

On Friday, N3B declared another PISA related to an inconsistency between DOE-STD-5506 and the current safety basis. The safety basis states that sympathetic deflagrations of additional waste containers can be prevented by not stacking containers and does not consider lateral as opposed to vertical sympathetic deflagrations. There are currently eight unvented containers, most of which contain cemented waste, stored aboveground at Area G. The containers are currently segregated in a restricted work zone and N3B is evaluating the storage situation. Container venting capability is not currently active at Area G; however, six of the unvented containers are 110-gallon drums that do not fit in the existing venting apparatus.

Federal Oversight: Mr. Pete Rodrik arrived this week to begin performing duties as the interim Manager of the NNSA Field Office. Later this summer, Mr. Ted Wyka will assume the permanent Manager position. Two new individuals also commenced their roles as Deputy Manager for Technical Operations and Deputy Manager for Business, Security, and Missions. As a result of these advancements and one departure, currently three of the four middle management positions in Technical Operations are vacant or being filled by individuals on temporary details.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 7, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: J.W. Plaue and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 7, 2021

DNFSB Staff Activity: Next Monday, J.W. Plaue will temporarily cease resident inspector duties to begin a detail as the acting Associate Technical Director for the newly formed Nuclear Facility Infrastructure and Projects group.

Weapons Engineering Tritium Facility: Last Friday, facility personnel noted that the closure mechanism for a fire door failed. This door is part of the facility structure, a safety class design feature. Engineering personnel evaluated the door and initially concluded it could still serve its safety function while secured with rubber door stops. Further evaluation concluded that the preventive maintenance performed last year to support the in-service inspection of the door was improperly completed. Facility personnel have declared a violation of the technical safety requirements and are planning to repair or replace the closure mechanism. Nuclear safety personnel have entered the New Information process to determine whether the existing configuration of the door provides the same fire rating as its tested configuration.

Emergency Management: On Wednesday, a team from the DOE Office of Enterprise Assessments in-briefed its upcoming assessment of the effectiveness of Triad and the NNSA Field Office in managing and maintaining emergency preparedness capability. The team plans to complete its primary interactions with LANL by the end of June with a final report expected in August.

Infrastructure: On Monday, Triad safety basis management transmitted to the NNSA Field Office for approval a major modification determination performed in support of a proposed project to replace an inoperable ventilation system exhaust fan in an inactive wing of the Chemistry and Metallurgy Research building with a externally-placed modular unit. This project will also serve as a demonstration of a key approach to transitioning other wings to an improved state of system reliability while awaiting final disposition. Of the six criteria provided in DOE-STD-1189-2016 for major modification determinations, Triad personnel concluded that the project tripped a single criterion associated with a hazard that is not previously evaluated in the safety basis. This hazard was associated with ventilation system maintenance performed outside. Triad personnel plan to develop new hazard scenarios for the ventilation system but expect they will not derive any new, or modifications to existing, credited safety systems.

Area G: N3B personnel commenced an Implementation Verification Review to validate adequate implementation of the compensatory measures documented in the consolidated standing order addressing 21 potential inadequacies of the safety analysis for the Area G safety basis (see 3/26/2021 report). Part of the review included a walkdown of storage areas to validate that pipe overpack containers with greater than 80 plutonium-239 equivalent curies and drums with the potential for energetic chemical reactions, as discussed in DNFSB/TECH-46, were segregated in their approved locations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 14, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending May 14, 2021

Transuranic Waste Management: Last Friday, Triad released LA-UR-21-24378, *Analysis of an Unexpected Reaction Observed During Drumout Activities, Feb. 26, 2021*, their final report for the investigation into the titanium fines event (see 4/16/2021 report). The report provides numerous recommendations to address the two identified root causes. Key recommendations for the root cause that the hazard of the reactive metal fines was not recognized include: ensuring potential pyrophoric hazards associated with inert gloveboxes are captured in work control documents, developing and implementing passivation criteria for material coming out of inert gloveboxes, and improving change control processes to re-evaluate hazards following changes such as scale-up or process modification. Recommendations for the second root cause that existing processes did not reject the prohibited material from the waste stream include: establishing a formal process for flowing down requirements from Central Characterization Project documents into Triad work control documents, requiring completion of chemical compatibility evaluations as discussed in DNFSB-TECH-46, and ensuring Acceptable Knowledge documentation accurately represents the nature of the process.

Safety Basis: On Wednesday, the NNSA Field Office approved a revision to the Triad Unreviewed Safety Question (USQ) process that addresses comments from the original submittal (see 11/20/2020 report). The Field Office provided one condition of approval. They requested that the procedure be revised such that the New Information process is indicated as being a part of the USQ process. They noted that the separation between the processes in the current revision is inconsistent with the DOE implementation guide for USQs. They further noted that entering the New Information process is an entry condition for the Potential Inadequacy of the Safety Analysis (PISA) process. As such, timeframes associated with the USQ process should start with entry into the New Information process. The Board's July 10, 2020 letter on complex-wide implementation of the PISA process also highlighted that DOE site contractors, including Triad, often take time to evaluate new information before entering their formal processes which could further extend the time a facility may be in an unsafe condition.

Area G–Safety Basis: Last Monday, the Environmental Management Field Office and Headquarters responded to N3B's most recent revision of their Safety Basis Strategy for upgrading the Area G safety basis to a modern DOE-STD-3009-2014 compliant document while maintaining safe current operations under the existing safety basis (see 3/19/2021 report). The letter provided several comments on the strategy but requested that the comments be used to inform N3B's safety basis development efforts instead of submitting a revision or formal comment response.

Readiness: This week, Triad submitted its third quarter startup notification report to the NNSA Field Office. Also this week, N3B received approval of its first and second quarter startup notification reports from the EM Field Office. Notable changes include shifting the project startup date for elevating the Radiological Laboratory Utility Office Building to a hazard category-3 nuclear facility out nine months to April 2022 and continued delays in venting the Flanged Tritium Waste Containers at Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 21, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending May 21, 2021

Area G–Safety Basis: On Monday, the Environmental Management Field Office and Headquarters approved the consolidated Evaluation of the Safety of the Situation (ESS) covering 18 of the current potential inadequacies of the safety analysis (see 3/26/2021 report). The Safety Evaluation Report included no conditions of approval. However, it did note a programmatic concern with application of the Unreviewed Safety Question process. N3B already responded to that concern in a March letter outlining their approach to adjudicating open safety basis issues.

On-Site Transportation: On Wednesday, Triad responded to the NNSA Field Office’s conditional approval and submitted a revised ESS addressing pyrophoric hazards in the Transportation Safety Document (see 2/12/2021 report). The revised ESS removes the previous allowance in a standing order to ship potentially pyrophoric materials in a pipe overpack container. It proposes to add a new packaging control to the Transportation Safety Document and Technical Safety Requirements. The packaging control will allow shipments of less than 50 grams of pyrophoric material using a pipe overpack container or SAVY-4000 container inside a Department of Transportation 7A drum.

Waste Characterization Reduction and Repackaging Facility (WCRRF): On Tuesday, the NNSA Field Office conditionally approved Triad’s request for a temporary exemption from the DOE Order 420.1C requirement to comply with NPFA 13 sprinkler installation requirements. The glovebox enclosure in WCRRF contains several sprinkler heads that are not installed per code. Triad sought the exemption to decontaminate the enclosure prior to fully evaluating the sprinkler system. NNSA’s three conditions of approval were: to include the exemption in the next annual update of the facility’s Fire Hazards Analysis, the approval expires one year after decontamination efforts are complete, and annually report to the field office on the status of correct actions. WCRRF is an aging facility that is currently in cold standby but is one option to restore size reduction capabilities on site (see 10/9/2020 report).

Transuranic Waste Facility (TWF): Late last month, TWF personnel completed converting their dry pipe fire suppression system from using nitrogen to dry air. This eliminated an asphyxiation hazard in the waste storage buildings and the need for oxygen monitoring (see 11/22/2019 report).

Federal Oversight: On Thursday, the DOE Office of Enterprise Assessments issued their final report on the results of their remote assessment of the Triad Nuclear Criticality Safety Program (see 2/5/2021 report). Overall, they concluded that the program has improved since the 2013 Director’s pause and that the NNSA Field Office has been providing comprehensive oversight. The one finding from the report was that criticality safety analysts authoring and reviewing criticality safety evaluations are not always ensuring compliance with analysis and documentation requirements defined in DOE-STD-3007. The report noted that approximately one third of the evaluations reviewed were noncompliant. There were several supporting deficiencies related to documentation and referencing of bases, references, and models in analyses. The team is planning a second assessment focused on control implementation and conduct of operations within the next year.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 28, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending May 28, 2021

DNFSB Staff Activity: On Wednesday, members of the Board's staff conducted a teleconference with Triad and NNSA Field Office personnel to discuss the results of their review of the Onsite Transportation Safety Document (see 3/19/2021 report).

Transuranic Waste Facility (TWF): On Tuesday, Triad submitted to the NNSA Field Office for approval a revised TWF safety basis. Last month, NNSA rejected a previous revision of this submittal which addresses issues with firewater pump acceptance curves (see 8/28/2020 report). Last October, Triad re-performed field tests of the firewater pump to establish a new performance baseline. The Fire Suppression System was elevated to safety-significant as a major contributor to defense-in-depth in a 2018 revision of the TWF Documented Safety Analysis. However, resolving the pump curve issues has delayed full implementation of said designation.

Transuranic Waste Management: A review team sponsored by NNSA's Office of Safety, Infrastructure, and Operations was onsite this week completing a review of transuranic waste needs to support production of 30 pits per year. The review scope is focused on optimizing the processes to compliantly prepare newly generated transuranic waste drums for shipment to the Waste Isolation Pilot Plant (WIPP) rather than looking at existing inventories. The team expects to complete their final report next month.

N3B completed two transuranic waste shipments to WIPP last week and one this week through Triad's RANT Shipping Facility. Given the additional controls and restrictions associated with the safety basis issues at Area G, and material at risk limitations at RANT, N3B will have a challenge in the near term building additional shipments from their current population of WIPP certified drums. Mobile loading at Area G, the alternative to shipping through RANT, is currently restricted due to a prohibition on crane usage at Area G as a compensatory measure to a potential inadequacy of the safety analysis. N3B and EM-LA are working to resolve safety basis issues and ramp up operations in a compliant manner.

Safety Basis: Earlier this month, the NNSA Field Office issued their review plan for the planned upgrade of the Plutonium Facility safety basis using DOE-STD-3009-2014. This safety basis update will include a new accident analysis using modern methodologies for key safety inputs such as the leak path factor, atmospheric dispersion modeling, and fire hazards analysis. Triad plans to submit the new safety basis in March 2022. The field office's review plan identifies additional subject matter expert support from other DOE organizations but does not yet identify a reviewer for the MELCOR code calculations that will be used to develop a new facility leak path factor. NNSA plans to update their review plan as additional resources are identified.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 4, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending June 4, 2021

Area G–Safety Basis: Last Thursday, N3B transmitted to the EM Field Office and EM Headquarters for approval a revised Justification for Continued Operations (JCO) for the Potential Inadequacy of the Safety Analysis (PISA) related to headspace flammable gas sampling (see 1/31/2020 report). EM personnel rejected a previous revision of this JCO (see 4/23/2021). The revised JCO attempts to address the EM concerns, and continues to propose a new Specific Administrative Control during flammable gas sampling that requires the filter vent cover to be removed within 10 hours. A supporting calculation estimates that it would take at least 22.5 hours to reach the lower flammability limit in a bounding drum with the vent covered.

Last Thursday, N3B also transmitted an Evaluation of the Safety of the Situation (ESS) for the PISA on horizontal sympathetic deflagrations for transuranic waste drums (see 4/30/2021 report). The eight unvented drums currently stored in Area G are not horizontally distanced from each other. The ESS adds a compensatory measure to limit the total material at risk (MAR) of the unvented drums. The eight drums together constitute less than 80 plutonium equivalent curies and so long as no additional unvented drums are added to the location, the consequences are protected as moderate. N3B will also prepare a JCO.

Also last Thursday, N3B transmitted a draft Chapter 3: Hazard and Accident Analysis and Control Selection for their new safety basis that will be developed per the modern DOE Standard 3009-2014 and informed by the developing revision to DOE Standard 5506.

Last Friday, N3B transmitted to the EM Field office and EM Headquarters for approval the ESS for the PISA on dome construction classification (see 4/30/2021 report). Of the three impacted domes, one does not currently store transuranic waste. All three have been restricted from receiving additional waste drums, however waste is not being moved out of the other two domes due to lack of space and a desire to minimize handling of drums with high MAR or potential chemical incompatibilities. N3B is preparing a JCO for this ESS as well.

Weapons Engineering Tritium Facility (WETF): Triad personnel concluded that the damaged fire door that was not properly latching represented a positive unreviewed safety question (see 5/7/2021 report). The condition was discovered on May 4, the PISA was declared on May 18, and the positive unreviewed safety question determination was made on May 28.

Emergency Management: On Thursday, Triad transmitted their response to the NNSA Field Office letter requesting a plan of action to address issues with improper emergency notifications (see 4/23/2021 report). The proposed plan of action includes a series of corrective actions to standardize emergency reporting requirements, improve emergency notification resources, and communicate leadership expectations for notifications. Many actions including rollout of new notification training have been completed already. Completion of all corrective actions is planned by the end of February 2022 with an effectiveness review to be performed in the same timeframe.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 11, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending June 11, 2021

Plutonium Facility–Glovebox Safety: On Monday, a worker in a plutonium machining area discovered contamination on their personal protective equipment while performing a survey upon exiting the glovebox gloves. There was no skin contamination or evidence of an uptake. Further evaluation determined that the over-gloves used to protect from substantial sharps hazards had a breach in the internal Kevlar layer. The outer goatskin layer was visibly worn, but the breach was not obvious from an external inspection. This type of over-glove was introduced in the facility in 2018 and has so far been performing well for allowing dexterity while providing additional protection. Facility personnel plan to evaluate additional inspections and lifetime tracking of these gloves.

Following the glovebox glove breach and uptakes last June (see 8/7/2020, 6/12/2020 reports), Triad performed an investigation and implemented several corrective actions including new practices for exiting glovebox gloves to detect breaches earlier and reduce their impact to others in the room. These practices were initially implemented via a standing order and were later rolled into the training requirements for glovebox workers. The training does not currently address inspection expectations when working in over-gloves as in the above event. During recent observations of glovebox work in the Plutonium Facility, the Resident Inspector has not observed rigorous compliance with the current requirement for a visual inspection of glovebox gloves prior to removing one's hands on every glovebox glove exit. Compliance with the long-standing requirement to survey one's hands following removal from glovebox gloves remains strong, however compliance with the new timing expectation of said survey, prior to securing the gloves, is mixed.

Transuranic Waste Management: Last Wednesday, Triad issued the Corrective Action Plan for the energetic event during a waste drumout activity (see 3/5/2021, 5/14/2021 reports). All corrective actions are expected to be completed this year. Of note, the corrective actions include one to develop process reviews that will include the process operators, waste packaging personnel, and representatives from the WIPP Central Characterization Program. The reviews will identify process inputs and outputs to support development of operations-specific Chemical Compatibility Evaluations and accurate Acceptable Knowledge Reports. The reviews are also intended to ensure that Chemical Compatibility Evaluations account for comingled streams and will support Safety Basis personnel in developing a systematic approach to analyze and control potential incompatible material hazards.

Plutonium Facility–Criticality Safety: On Thursday, Triad nuclear criticality safety personnel issued a revised memo that provides a new basis for the conclusion that a criticality accident resulting from leakage of fissile solutions from aqueous chloride process areas to a non-safe geometry in the basement was not credible (see 1/15, 1/8/2021 reports). The new memo notes that due to non-seismically qualified gloveboxes and the potential for cracks to form in the floor, fissile solution could potentially leak into the basement. However, given the location of the boxes where a leak could occur and the pathways to an unfavorable geometry in the basement (e.g., a sump), the memo concludes that it would be incredible for the maximum possible volume of leaked solution to accumulate into a critical geometry.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 18, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending June 18, 2021

Transuranic Waste Management: Last Thursday, workers identified a transuranic waste drum on an outdoor storage pad with a corroded drum filter. They promptly tagged and segregated the drum, and later moved it indoors to the basement of the Plutonium Facility. The drum primarily contains glovebox gloves from heat source plutonium operations. Filter corrosion was observed two years ago from drums containing the same type of gloves used in heat source operations (see 5/24/2019 report). Unlike the previous event, facility personnel declared the drum inoperable due to the degraded filter. The resident inspector believes that is the appropriate decision for heavily corroded drum filters, where their ability to provide a filtered vent path is not readily discernable through a visual inspection. The more modern Transuranic Waste Facility safety basis includes more explicit statements about filter integrity for drum operability than the Plutonium Facility safety basis. Triad plans to analyze the filter to determine the cause of the corrosion.

Area G–Safety Basis: Last Friday, Environmental Management Headquarters and Field Office personnel unconditionally approved the Justification for Continued Operations (JCO) for the potential inadequacy of the safety analysis for headspace flammable gas sampling of transuranic waste drums (see 6/4/2021, 1/31/2020 reports). DOE noted they expect the JCO to be implemented within 90 days. Due to inclusion of a new credited hazard control in the JCO, N3B is planning an Implementation Verification Review.

Plutonium Facility–Conduct of Operations: Housekeeping and management of low-level and other combustible waste in the basement of the Plutonium Facility has been a continuing challenge. The increased pace of construction work to support the pit production mission has correspondingly increased waste generation. During basement walkdowns, the resident inspector has noted numerous plastic bags filled with garbage accumulating. Of note, several undated plastic bags filled with cardboard framed air filters have been staged for the past month. An informal marking on one bag notes that these filters have no waste acceptance form and are of questionable provenance. There is also no transient combustible permit associated with the bags. Facility management does have a project to improve housekeeping in the basement. On a positive note, during the last plant inventory, the amount of combustible waste in the basement was significantly lower than normally observed.

On Site Transportation: Last Tuesday, Triad submitted to the NNSA Field Office for approval an addendum to the Transportation Safety Document to allow shipping of potentially pyrophoric material in accordance with the proposal outlined in a recent Evaluation of the Safety of the Situation (see 5/21/2021 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 25, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending June 25, 2021

Federal Oversight: The resident inspector met with Mr. Ted Wyka who became the manager of the NNSA Field Office on Monday. He replaces Mr. Pete Rodrik who served two months as the interim Field Office Manager.

Plutonium Facility–Criticality Safety: On Monday, workers inadvertently moved water resistant containers with salt residue materials into a glovebox where that material type was not allowed per the criticality safety posting. They moved these materials out of a dropbox to move in a higher mass item while maintaining compliance with its mass limits. Promptly after they moved the containers, while performing checks, they identified the error and responded appropriately. This was an analyzed upset condition in the criticality safety evaluation for the receiving glovebox. The upset condition was recovered later in the week. Criticality Safety personnel plan to evaluate whether the criticality safety evaluation and posting for the receiving glovebox should be revised to allow inclusion of this type of material. They also plan to evaluate increasing the mass limit for the dropbox the materials were moved from.

Chemistry and Metallurgy Research Building (CMR)–Safety Basis: On Monday, Triad personnel declared a Potential Inadequacy of the Safety Analysis (PISA) for the analysis of wildfire hazards in the CMR yard. The safety basis states that plume lofted burning embers from wildfires of any size cannot impact containers stored in the CMR yard. Triad safety analysts noted that the wildfire analysis calculation does not support that conclusion for the entire yard, but only for one sheltered area of the yard. Since the safety basis analyzes other potential types of fires that can impact containers in the yard and identifies existing credited and non-credited controls, Triad is not adding any compensatory measures to address this PISA.

Area G–Safety Basis: Last Friday, N3B submitted to the Environmental Management Field Office and Headquarters a revised Evaluation of the Safety of the Situation (ESS) for the PISA related to DNFSB TECH-46 and potentially energetic drums. The new revision is intended to resolve DOE’s comments on the previous revision which was rejected (see 1/22/2021, 4/2/2021 reports). It includes detailed tables of waste containers subject to operational restrictions following extent of condition reviews of the entire population of above ground containers looking for potential chemical incompatibilities or unknown contents.

Plutonium Facility–Infrastructure: On Tuesday, the NNSA Field Office and the Federal Project Director unconditionally approved the Safety Design Strategy for the Chemistry and Metallurgy Research Replacement Plutonium Facility Equipment Installation Phase 2 subproject. The majority of the scope in this project does not directly impact the safety basis of the Plutonium Facility, however construction to support an expanded access portal for the Plutonium Facility will impact the safety class missile barriers. The approval letter notes that the safety function of the barrier must be maintained during all phases of work.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 2, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending July 2, 2021

DNFSB Staff Activity: Staff members J. Jarvis, P. Migliorini, J. Plaue, and S. Seprish were on site this week for a review of Critical Decision 1 (Approve Alternative Selection and Cost Range) of the Los Alamos Plutonium Pit Production Project (LAP4). Staff member R. Kazban supported the review remotely. The onsite team also walked down the Plutonium Facility and Technical Area 21 and held discussions with N3B and Environmental Management Field Office personnel regarding the current state of Area G operations within safety basis constraints.

Plutonium Facility–Infrastructure: The resident inspector and headquarters staff members walked down the Plutonium Facility to better understand the current pit production flowsheet and infrastructure improvements related to LAP4. The team noted the challenge of maintaining current production work while construction efforts to add and upgrade equipment is in progress. While the construction work occurs primarily on the backshift, scaffolding and other equipment increases congestion in the process rooms.

Chemistry and Metallurgy Research Building (CMR)–Radiological Protection: On June 16th, a radiological control technician surveying out of a high contamination area/airborne radioactivity area in the Wing 5 basement discovered contamination on their personal protective equipment (PPE). Further surveys identified skin contamination on the back of the ankle and personal clothing contamination at the pant cuffs. The individual was successfully decontaminated. The PPE requirements for this area included shoe covers that do not overlap with coveralls and are not required to be taped. That is a standard practice at the laboratory. As a corrective action, Triad personnel are planning to supply personnel at CMR with PPE used at the Plutonium Facility including anti-contamination socks and bands to secure pant legs. The area where the individual was working is subject to leaks from an industrial waste line and is the most contaminated area in the facility. Repairs to leaking flanges and decontamination of the room are planned for later in the summer.

Legacy Facilities: The resident inspector and headquarters staff members walked through Technical Area 21 with N3B and Environmental Management Field Office personnel and discussed the plans to perform additional characterization for TA-21-257 and the underground industrial waste lines (see 4/9/2021 report). In May, N3B submitted to the field office for approval a Justification for Continued Operations to allow these characterization activities.

Safety Basis: On Tuesday, Triad submitted to the NNSA Field Office for approval a revision to their proposed protocol and input parameters for dispersion analysis (see 2/26/2021 report). The revision is intended to address technical comments from the Field Office provided on the previous February submittal. Upon approval by the Field Office, this will be a key input to the upgrade of the Plutonium Facility safety basis to DOE-STD-3009-2014.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 2, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending July 2, 2021

DNFSB Staff Activity: Staff members J. Jarvis, P. Migliorini, J. Plaue, and S. Seprish were on site this week for a review of Critical Decision 1 (Approve Alternative Selection and Cost Range) of the Los Alamos Plutonium Pit Production Project (LAP4). Staff member R. Kazban supported the review remotely. The onsite team also walked down the Plutonium Facility and Technical Area 21 and held discussions with N3B and Environmental Management Field Office personnel regarding the current state of Area G operations within safety basis constraints.

Plutonium Facility–Infrastructure: The resident inspector and headquarters staff members walked down the Plutonium Facility to better understand the current pit production flowsheet and infrastructure improvements related to LAP4. The team noted the challenge of maintaining current production work while construction efforts to add and upgrade equipment is in progress. While the construction work occurs primarily on the backshift, scaffolding and other equipment increases congestion in the process rooms.

Chemistry and Metallurgy Research Building (CMR)–Radiological Protection: On June 16th, a radiological control technician surveying out of a high contamination area/airborne radioactivity area in the Wing 5 basement discovered contamination on their personal protective equipment (PPE). Further surveys identified skin contamination on the back of the ankle and personal clothing contamination at the pant cuffs. The individual was successfully decontaminated. The PPE requirements for this area included shoe covers that do not overlap with coveralls and are not required to be taped. That is a standard practice at the laboratory. As a corrective action, Triad personnel are planning to supply personnel at CMR with PPE used at the Plutonium Facility including anti-contamination socks and bands to secure pant legs. The area where the individual was working is subject to leaks from an industrial waste line and is the most contaminated area in the facility. Repairs to leaking flanges and decontamination of the room are planned for later in the summer.

Legacy Facilities: The resident inspector and headquarters staff members walked through Technical Area 21 with N3B and Environmental Management Field Office personnel and discussed the plans to perform additional characterization for TA-21-257 and the underground industrial waste lines (see 4/9/2021 report). In May, N3B submitted to the field office for approval a Justification for Continued Operations to allow these characterization activities.

Safety Basis: On Tuesday, Triad submitted to the NNSA Field Office for approval a revision to their proposed protocol and input parameters for dispersion analysis (see 2/26/2021 report). The revision is intended to address technical comments from the Field Office provided on the previous February submittal. Upon approval by the Field Office, this will be a key input to the upgrade of the Plutonium Facility safety basis to DOE-STD-3009-2014.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 9, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending July 9, 2021

Area G: N3B personnel continue their efforts to address transuranic waste containers with potential reactivity hazards as described in the revised Evaluation of the Safety of the Situation related to DNFSB-TECH-46 that was recently submitted to the Environmental Management Field Office (see 6/25/2021 report). The initial sets of containers identified as potentially reactive were moved into a single layer in the Dome 375 Permacon (see 2/12/2021 report). As N3B performed an extent of condition, they identified more containers of potential concern, and determined through additional review that some previously identified containers did not constitute a concern. There are currently 60 containers subject to operational restrictions due to potential reactivity. Fifteen of them are segregated in the Dome 375 Permacon and the rest remain in their original storage domes as N3B and the Field Office later determined it would be more prudent to avoid moving potentially reactive containers. For the drums that were not moved, N3B recently completed a posting effort to help assure compliance with operational restrictions. The current restrictions are that the containers shall not be moved, there is a marked buffer zone established around each container of potential concern, and intrusive operations are prohibited within the buffer zone.

The resident inspector has noted during walkdowns that control of vegetation in Area G has improved significantly this growing season following corrective actions from a 2019 Technical Safety Requirements violation (see 12/20/2019 and 6/5/2020 reports).

Plutonium Facility–Operations: While restarting control systems following a variable frequency drive upgrade for the ventilation system on Saturday June 26, Triad personnel discovered problems with the Facility Control System (FCS). The FCS is a safety-significant support system that controls and monitors the safety functions of the ventilation system. They determined the system was inoperable per the Technical Safety Requirements but were able to restore it to operability later that day. On the next Tuesday, Triad personnel identified additional issues with the FCS, declared it inoperable, and entered the associated limiting condition of operation. Replacement of an optical communications module resolved the issues with the system and, following additional monitoring of the system, facility personnel exited the limiting condition of operation and declared the FCS operable. The communications module has been installed for approximately seven years. The modules are currently scheduled to be replaced every eight years per the manufacturer's recommendations and spares are available. Facility personnel are evaluating their replacement and maintenance cycles as well as what level of system evaluation should occur following system errors.

Plutonium Facility–Radiological Safety: Last Tuesday, while performing an orderly exit of their area due to the FCS outage described above, an operator discovered contamination on a personal protective equipment glove. The cause was a glovebox glove breach. There was no skin contamination. The individual had been cutting open a 3013 can of plutonium feed, an activity with many potential sharps and pinch points. However, they were using overgloves and there was no evidence of damage to the overglove.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 16, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending July 16, 2021

Emergency Management: On Monday, a 4.2 magnitude earthquake and several smaller events occurred approximately 50 km northwest of the laboratory. Onsite personnel felt the event, and facility personnel performed inspections which concluded there was no damage. A seismic cutoff valve for the natural gas feed into TA-55 did actuate during the event.

On Tuesday, the NNSA Field Office conditionally approved Triad's April request for an extension of the suspension of certain requirements from DOE Order 151.1D, *Comprehensive Emergency Management System*, as a result of the COVID-19 response. Triad noted they would be unable to meet many of the order's requirements for FY2021 largely due to limiting in-person drills. While NNSA agreed to continue the suspension of requirements, they noted that due to increasing vaccination, the risk profile for conducting more in-person drills and exercises is far lower now than when the suspension of requirements per secretarial memo was enacted last October. Therefore, NNSA provided two conditions of approval. First, they asked that Triad develop a prioritized list of facilities to begin conducting in-person drills and exercises prior to the end of the fiscal year. Second, they stated that Triad should begin meeting all order requirements at the start of FY2022.

Transuranic Waste Management: Triad has resumed regular shipping of their transuranic waste to the Waste Isolation Pilot Plant. NNSA owned shipments were paused following the February reactive event involving titanium fines. Last week, there were two shipments from the RANT Shipping Facility which included a mix of NNSA and EM owned containers. There were also two shipments of NNSA owned containers from the RANT Shipping Facility this week.

Chemistry and Metallurgy Research Building (CMR)–Infrastructure: On Tuesday, the NNSA Field Office concurred with Triad's determination that installation of a supplemental ventilation skid to replace a failed ventilation fan in the inactive Wing 3 of CMR does not constitute a major modification (see 5/7/2021 report).

Transuranic Waste Facility (TWF): On Wednesday, the NNSA Field Office unconditionally approved the revised safety basis for TWF that addresses performance of the fire pumps (see 5/28/2021 report). The approval noted that the new revision addressed all NNSA comments on a previous version and requested implementation within 60 days. Full implementation is the last step to get the fire suppression system elevated to safety-significant, as originally documented in a 2018 safety basis revision.

Plutonium Facility–Conduct of Operations: The resident inspector and Triad personnel walked down portions of the Plutonium Facility to observe current housekeeping and combustible loading conditions. Conditions were not appreciably different compared to last month (see 6/18/2021 report). While facility personnel have removed some of the combustible items that had been lingering in the basement, the overall amount of waste bags in that area was slightly higher. Triad management is accelerating their efforts to improve waste removal and housekeeping in the facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 23, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending July 23, 2021

DNFSB Staff Activity: Staff member L. Lin was on site this week for resident inspector training in preparation for an assignment at the Savannah River Site. Members of the DNFSB headquarters staff called into the virtual Los Alamos National Laboratory Master Asset Plan Deep Dive held this week by the NNSA's Office of Safety, Infrastructure, and Operations.

Plutonium Facility–Operations: On Monday, there was a spill of over 200 gallons of water in the Plutonium Facility. Following refilling of a seal water tank, a worker did not close one valve, and another spring-closed valve did not fully shut, resulting in water flow. The water moved into a ventilation header where it drained out of an inactive glovebox. An alarm in the Operations Center was not acted on as personnel thought it was an expected alarm during the maintenance evolution. The water spread contamination to the floors of adjacent rooms and into the basement. No individuals were contaminated or injured during the event. Triad personnel are drying and decontaminating the impacted rooms. They also entered the New Information process to evaluate whether water ingress into gloveboxes through the ventilation system could result in an unanalyzed criticality scenario.

Plutonium Facility–Construction: Last Thursday, a continuous air monitor (CAM) alarmed inside a tent while construction workers were separating internally contaminated piping from a glovebox slated for removal. CAM alarms positioned in the room outside of the tent did not alarm. All the workers were in respiratory protection, and none were contaminated. During the fact finding this week, participants noted that having point source ventilation located an appropriate distance from the cut would likely have helped capture contamination. There was also a discussion of the challenges of performing equipment removals where active facility assets are in the same room as construction work (see 7/2/2021 report).

Area G: Last Thursday, N3B personnel discovered that a monthly Technical Safety Requirements surveillance of thermal separation distances had not been performed. The thermal separations are established to reduce the likelihood of fire propagation between defined areas where material at risk is present. A line in a reference table used while performing the surveillance was inadvertently deleted in March 2020. Additional revisions had been made since then without the error being caught. Furthermore, the version in document control was two revisions out of date. A causal analysis of this event is planned. All separation distances in the impacted area are currently in compliance.

On Thursday, the Environmental Management Field Office and Headquarters approved the Evaluation of the Safety of the Situation (ESS) for the PISA related to DNFSB TECH-46 and potentially energetic drums (see 6/25/2021). They provided two directed changes. First, they directed N3B to revise one of the existing compensatory measures in the submittal to identify additional physical barrier types to protect waste containers of concern from forklift impacts. Second, they directed that N3B install jersey barriers to prevent forklift impacts to stacked shielding adjacent to drums of concern. On Monday, Environmental Management unconditionally approved the ESSes for dome construction classification and horizontal sympathetic drum deflagrations (see 6/4/2021 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 30, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending July 30, 2021

DNFSB Staff Activity: On Thursday, members of the DNFSB staff held a call with NNSA Field Office and Headquarters personnel to discuss the response to DNFSB-TECH-46. On Tuesday, staff members held a call with NNSA Field Office personnel to support a review of DOE directives in NNSA's management and operation contract for the laboratory.

Plutonium Facility: On Wednesday, Triad personnel concluded that the water overflow in the Plutonium Facility last week (see 7/23/2021 report) represents an unanalyzed water ingress mechanism for criticality scenarios in gloveboxes and therefore constitutes a potential inadequacy of the safety analysis (PISA). The PISA is currently specific to the criticality hazard from water interaction. The resident inspector notes that a steam pressurization event is another potential hazard from unintended ingress of water. The existing Plutonium Facility safety basis includes a steam over-pressurization event from cooling water entering furnaces or calciners in gloveboxes. Water ingress from the ventilation system could be another mechanism for this event which may need different controls than the existing scenario.

Facility personnel are continuing recovery from the overflow event. Two of the impacted rooms have been decontaminated and released back to operations. The others remain in progress.

Last Tuesday, the NNSA Field Office approved a safety basis addendum supporting changes to storage of heat source plutonium items in fire rated safes. There is a new material-at-risk limit for the safes, which are now specifically credited as safety class. In their approval, NNSA directed Triad to resolve several comments in a future revision of the safety basis. The comments included a request to revise one of the hazards analysis events and to clarify language regarding maximum internal temperatures.

Emergency Management: On Tuesday, Triad conducted an operations-based emergency drill in Technical Area 11, a high explosives area. The scenario involved a wildland fire initiated by a lightning strike. Field play included deployment of Los Alamos Fire Department wildland division resources. The NNSA Field Office recently requested that Triad resume in-person emergency drills and exercises (see 7/16/2021 report).

RANT Shipping Facility: Last Wednesday, the NNSA Field Office unconditionally approved a page change to the safety basis for the RANT Shipping Facility. The change modifies the term "outer drums" to the more generic "outer TRU waste container." This will allow the RANT Shipping Facility to compliantly handle Ten Drum Overpacks and Standard Waste Boxes in addition to drums.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 6, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending August 6, 2021

DNFSB Staff Activity: On Thursday, DNFSB staff members held a closeout call with Triad and NNSA Field Office personnel to review the staff's observations from their review of the Critical Decision 1 (Approve Alternative Selection and Cost Range) of the Los Alamos Plutonium Pit Production Project (LAP4).

Transuranic Waste Facility (TWF): On Wednesday, a lightning strike damaged the fire protection system at TWF. Following the storm, Triad personnel evaluated the system due to alarms that actuated. They discovered that the control panels for both fire water pumps were damaged by the strike. Implementation of the new safety basis that elevates the fire suppression system to safety-significant is in progress but not complete. Therefore, the new limiting condition of operation associated with the fire pumps is not yet applicable (see 7/16/2021 report). Facility personnel placed TWF into warm standby and instituted a fire watch. They are beginning procurements to replace the damaged components since spares were not on hand. Implementation of the new safety basis will be delayed due to this event.

Plutonium Facility–Safety Basis: Triad personnel concluded that the recent potential inadequacy of the safety analysis (PISA) associated with the water overflow in the Plutonium Facility constituted a positive unreviewed safety question (USQ) (see 7/30/2021 report). While the PISA was specific to unanalyzed criticality safety scenarios, the USQ is more expansive and also notes that this previously unanalyzed source of water may also be a new initiator for other hazard scenarios including steam overpressurization and contamination spreads.

Area G–Safety Basis: Last Friday, N3B submitted to the Environmental Management Field Office and Headquarters for approval the Justification for Continued Operations (JCO) for the PISA related to DNFSB TECH-46 and potentially energetic drums (see 7/23/2021 report). The JCO notes that upon further evaluation, 27 of the 60 containers identified as potentially reactive do not pose a reactivity hazard and no longer need supplemental controls. For the remaining containers of concern, the JCO removes the previous prohibition on operations with these containers and would allow limited doublepacking and movement under new controls such as vehicle spotting, lift plans, restriction of other activities, and combustible control. DOE personnel are evaluating the submittal.

Weapons Engineering Tritium Facility (WETF): On Friday, Triad submitted to the NNSA Field Office for approval a safety basis addendum to support upcoming plutonium coupon studies at WETF (see 3/12/2021 report). The amount of plutonium handled in WETF will be limited to protect the calculated low consequences and ensure that criticality is not credible. The submittal also identifies several defense in depth controls including a robust container. Last Thursday, Triad submitted to the NNSA Field Office for approval another safety basis addendum that changes the limiting oxidant concentration for the safety-significant oxygen monitoring system from 5.0% to 4.6% to match the current national consensus code (see 11/27/2020 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 13, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending August 13, 2021

DNFSB Staff Activity: On Tuesday, staff members held a call with Environmental Management Field Office personnel to support a review of DOE directives in the Legacy Cleanup Contract.

Plutonium Facility–Criticality Safety: Last Friday, the NNSA Field Office responded to Triad’s memo regarding the potential for fissile solutions to leak into the basement of the Plutonium Facility (see 6/11/2021 report). NNSA concurred with the memo’s conclusion that it is not credible for a criticality event to result from the leakage scenario. However, they noted that the analysis supporting this conclusion was incomplete and requested it be revised to better support the overall conclusion. For example, the current analysis only addresses fixed collection points in the basement and does not include other potential collection points such as buckets. NNSA personnel performed a walkdown of aqueous processing rooms and vertically adjacent basement locations with Triad engineering and criticality safety personnel three weeks ago as part of their evaluation of Triad’s conclusions.

Area G: Following completion of an implementation verification review, N3B and Central Characterization Project personnel have resumed flammable gas measurements to support certifying transuranic waste drums for shipment to the Waste Isolation Pilot Plant. The measurements must be performed compliant with the recently approved Justification for Continued Operations for the activity (see 6/18/2021 report) and all other current restrictions at Area G in place from the numerous safety basis issues. This activity had been paused since the beginning of 2020 (see 1/31/2020 report).

Chemistry and Metallurgy Research Building (CMR)–Deactivation and Decommissioning: Last week during a walkdown, facility industrial hygiene personnel discovered that a subcontractor removed a chemical hood from Wing 3 that had not been sampled for perchlorates. Perchlorate sampling is part of a specific administrative control (SAC) to prevent explosions of residual perchlorates in the ventilation system. The subcontractor removed the hood two weeks ago as part of their equipment removal scope. They did use wet methods during the removal which the SAC would have required for sampling results above a threshold level. Facility management determined that this event constituted a violation of the Technical Safety Requirements. They also noted other issues surrounding this event including inappropriate work release, a lack of clarity in the language of the SAC and its implementing procedure, and informal tracking of sampling activities and results. Invasive work by the subcontractor is currently paused while corrective actions are developed and implemented. Planned actions include additional rigor in documenting locations where perchlorate sampling has been completed, development of a labeling system for simple visual identification of sampled locations, and inclusion of a hold point in the subcontractor work documents to verify perchlorate sampling has been completed and is within specified limits.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 20, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending August 20, 2021

Plutonium Facility–Readiness: Last week continuing into this week, an independent contractor team performed a readiness assessment for the Isotope Fuels Impact Tester (IFIT) in the Plutonium Facility. The system has not been used since the end of 2019 so it is going through the formal review process prior to restarting hot operations. The cold impact test using a fuel clad containing no nuclear material was also observed by members of the federal team, which will complete their readiness review following closeout of actions from the contractor readiness team. At their outbrief, the contractor team identified four pre-start and one post-start finding and concluded that the IFIT process could be restarted safely upon resolution of the prestart findings. They also provided a positive observation on the cleanliness and housekeeping of the IFIT room.

Weapons Engineering Tritium Facility (WETF): Last week, WETF personnel completed all required surveillances and started using new digital tritium monitors to support real time tritium monitoring as part of the safety-significant Tritium Monitoring System. The installation and testing of these new monitors was a multi-year upgrade project to increase system reliability.

On Wednesday, the NNSA Field Office concurred with Triad’s conclusion that the upcoming plutonium coupon study at WETF does not constitute a major modification to the facility (see 8/6/2021 report).

Area G: Last Thursday, N3B personnel declared a violation of the technical safety requirements (TSR) after they discovered that they had not completely performed two quarterly surveillances in the TSR that verify waste storage area dimensions and separation distances. The engineering drawing supporting the surveillance procedure had an error in its designation for Dome 375 so the field verification of conditions in that area could not be verified against requirements. A similar error occurred last month involving thermal separation distances (see 7/23/2021 report). Facility management authorized an extension of the completion time for the surveillance requirements while the drawings and procedures are corrected. N3B personnel are also performing a walkdown of all drawings used to support TSR surveillances.

Site Infrastructure: On Monday, there was a power outage to portions of the laboratory due to a utility pole fire and a circuit breaker relay opening. The only nuclear facility impacted was the RANT Shipping Facility, which lost power for approximately two hours.

Federal Oversight: On Monday, Mr. Michael Mikolanis became the new manager of the Environmental Management Field Office.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 27, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending August 27, 2021

Transuranic Waste Management: Last Friday, N3B and Central Characterization Project personnel completed a cold mockup demonstration of transuranic waste mobile loading operations. Mobile loading has not taken place at Area G since last October. The demonstration activity took place in a parking lot outside of the Area G facility boundary. Mobile cranes are currently prohibited within Area G, regardless of whether material-at-risk is present, due to current operational restrictions that address safety basis issues (see 2/26/2021 report). The intent of the demonstration was to maintain proficiency for the activity while it cannot be performed normally. It proceeded without incident other than a missing step in a procedure which was identified and corrected through N3B's immediate procedure change process.

Triad has not performed mobile loading at Technical Area 55 since last November. They plan to exercise the activity in October before a full year has elapsed so that they would not have to perform a readiness review per DOE directives.

Transuranic Waste Facility (TWF): On Tuesday evening after restoring operability of the fire suppression system, TWF personnel ended the one-hour fire watch that had been in place following damage to fire protection systems from a lightning strike earlier in the month (see 8/6/2021 report). They replaced the damaged fire pump controllers and brought in the vendor to troubleshoot the generator. The replacement components do not meet the quality assurance requirements for the future safety-significant designation of the system. Parts meeting those requirements have been ordered. Implementation of the new safety basis will be delayed pending receipt and installation of those parts and testing of the system.

Plutonium Facility–Conduct of Operations: A corporate team from one of Triad's integrated subcontractors performed a review this week and last week of conduct of operations at Technical Area 55. They briefed the results of their review to Triad and NNSA Field Office personnel on Tuesday. The review team had no findings and concluded that the current state of conduct of operations was adequate to perform work safely. However, they noted that Triad needs additional qualified personnel and improved rigor in conduct of operations to perform work effectively. The final report from the review including its recommendations for improvements is expected in mid-September.

Plutonium Facility–Criticality Safety: On Wednesday, Triad submitted to the NNSA Field Office for concurrence the recovery plans to restore negative pressure chilled water systems to service following the overflow event in one system last month (see 7/23/2021 report). The recovery plans include providing administrative verifications intended to prevent overfilling the systems during refill and restart until engineered controls are proposed, evaluated, and implemented. NNSA is evaluating the submittal.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 3, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending September 3, 2021

Area G: On Wednesday, Environmental Management Field Office and Headquarters personnel conditionally approved four Justifications for Continued Operations including the one pertaining to DNFSB TECH-46 and potentially energetic drums (see 8/6/2021 report). The approval letter included two conditions of approval and nine directed changes for the four submittals. The requested changes primarily relate to the details of combustible controls.

On Sunday morning during a post-weather event walkdown, facility personnel discovered one of the poles supporting the catenary lightning protection system around Dome 48 had fallen onto the dome. No waste containers were impacted. There was minor structural damage to the dome frame and a new tear in the fabric. The dome was already scheduled to be reskinned for existing fabric degradation. On Sunday afternoon, facility management authorized immediate actions outside of the facility's safety basis in order to remove the pole using equipment containing liquid fuel beyond current limits. They successfully removed the pole without incident and removed all equipment. The lightning protection system is not formally credited in the safety basis, and its operability is currently degraded. Facility personnel are evaluating repair options to the system and to Dome 48.

Radioactive Laboratory Utility Office Building (RLUOB): Triad personnel completed an Implementation Verification Review (IVR) for the upgrade of RLUOB to a Hazard Category 3 nuclear facility to be known as PF-400. The team identified two findings: one related to filter replacement frequency and the other regarding material at risk controls for hallways.

Transuranic Waste Management: An extent of condition review following the RLUOB's IVR team's questions on the Specific Administrative Control (SAC) prohibiting polysaccharides and concentrated nitric acid identified five transuranic waste drums at the Chemistry and Metallurgy Research Building (CMR) that may contain a prohibited mixture. Both facilities have the same prohibition on concentrated nitric acid and polysaccharides. While further evaluation concluded there was no immediate concern, the question highlights challenges in compliantly loading waste drums. CMR and RLUOB generate waste drums over time where individual bags of waste are evaluated and then combined into a single drum. As written, the facility SACs totally prohibit the presence of concentrated nitric acid and polysaccharides in the same drum with no allowance for trivial quantities. The waste packaging requirements procedure has a more limited prohibition, and individual loading procedures do not note the SAC. The procedures also do not provide guidance on evaluating combinations from different bags in the same waste container.

Emergency Management: On Wednesday, Technical Area 55 personnel held a coached tabletop training drill. The scenario was a criticality event in the Plutonium Facility. Drill participants identified several items for follow-up including assessing communications capabilities in the alternative Operations Center. Facility personnel ordinarily perform a required annual field drill and facility evacuation for a criticality event. This was not performed in Fiscal Year 2020 due to COVID, so the last field performance was in October 2019. The field drill for Fiscal Year 2021 is planned later in September.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 10, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending September 10, 2021

DNFSB Staff Activity: On Wednesday, DNFSB staff members held a call with Triad and NNSA Field Office Personnel to discuss the staff's observations from their review of the combustible trailer formerly parked adjacent to an outside transuranic waste storage pad at the Plutonium Facility (see 2/12/2021 report). While the trailer was moved away from the location adjacent to waste drums by facility personnel, the staff believes its ordinary combustible hazard is not treated appropriately in the safety basis which focuses on combustible liquids.

Federal Oversight: On Wednesday, the Environmental Management Field Office issued its corrective action plan to address the findings and management concerns from the EM Chief of Nuclear Safety's review of nuclear safety functions at the Field Office (see 7/17/2020 report). Key corrective actions developed from a causal analysis of the issues include: completing development of a compliant nuclear safety basis review and approval procedure; and training and mentoring nuclear safety staff on the expectations and discipline required in the review and approval of safety basis submittals.

Plutonium Facility–Safety Basis: Last Thursday, Triad submitted to the NNSA Field Office for approval an Evaluation of the Safety of the Situation (ESS) for a recent spill in the Plutonium Facility (see 8/6/2021 report). The proposed operational restrictions stem from those already in place from Triad's recovery memo for this event (see 8/20/2021 report). They will remain in place until a Justification for Continued Operations changes them or a permanent engineered solution is developed.

Plutonium Facility–Radiological Safety: Last Tuesday, a worker discovered contamination on their hand when using a hand and foot monitor upon exiting a laboratory room. Radiological control personnel responded and were able to successfully decontaminate the individual. Facility personnel are evaluating the best approach to personal protective equipment usage for the activity involved.

Chemistry and Metallurgy Research Building (CMR): On Tuesday, the NNSA Field Office unconditionally approved the ESS for wildfire impacts on waste containers stored in the CMR yard (see 6/25/2021 report). The ESS acknowledges the previously unanalyzed hazard and describes existing controls that address it including the design of certain containers, the material-at-risk management specific administrative control for the yard, and the material-at-risk inventory control.

Also on Tuesday, Triad submitted to the NNSA Field Office for approval a safety basis addendum addressing the planned outdoor ventilation skid to support Wing 3 (see 5/7/2021 report). The changes identify new events that can impact the system due to its outdoor location and adjust the existing material-at-risk inventory control to address the externally mounted filter.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 17, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending September 17, 2021

Plutonium Facility–Criticality Safety: On Monday, a Plutonium Facility worker was reviewing a database to determine options for a future nuclear material movement. They noted that the recorded mass of material in a glovebox appeared higher than the posted criticality safety limit and reported the concern. Facility and criticality safety personnel responded and found that the amount of nuclear material in the glovebox exceeded the limit on the criticality safety posting. Criticality safety personnel determined the overmass was bounded by the analysis in the criticality safety evaluation and the condition was currently safe and stable. The glovebox has been posted out of service until the condition is resolved. Further review of the event determined that the workers who moved the material into the glovebox did not fully understand the language on the criticality safety posting. The posting was updated last year and the limits on material type masses included the new logical connector “with” instead of the more routinely encountered “and” or “or.” The term “with” is not yet formally defined in the criticality safety command media for Technical Area 55. The posting does include a table of example masses for material type combinations to help explain the intent of the new language. Triad personnel are evaluating the best language to define this type of mass limit which adds value to several operations that inherently create a change in material form, but is not yet trained on or widely understood. This event also showed the potential for error due to the tremendous number of material moves being performed. Congestion in many process rooms has reached the point where it often takes several moves to get other items out of the way to support movement of a part while complying with mass limits in each location.

Safety Basis: On Thursday, the NNSA Field Office transmitted a letter to Triad directing they provide schedules and implementation plans for implementing the newly revised DOE-STD-5506-2021, *Preparation of Safety Basis Documents for Transuranic Waste Facilities*. For the Plutonium Facility, they requested implementation be coordinated with the current upgrade of the safety basis to DOE-STD-3009-2014. For the other nuclear facilities, they requested recommendations as to whether to implement DOE-STD-5506-2021 promptly or to defer to when the safety bases for those facilities are upgraded to DOE-STD-3009-2014.

Emergency Management: On Wednesday, Triad personnel performed the annual criticality evacuation drill for the Plutonium Facility. This was the first field performance of the drill since October 2019. There was a tabletop drill earlier this month and an e-mail response based ‘virtual drill’ in December 2019 (see 9/3/2021 report). The scenario for the field drill was a criticality event in a laboratory room with three casualties in the immediate area and four others receiving an elevated dose in an adjacent hallway.

Weapons Engineering Tritium Facility (WETF): On Wednesday, the NNSA Field Office unconditionally approved the safety basis addendum to support plutonium coupon studies at WETF (see 8/6/2021 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 24, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending September 24, 2021

DNFSB Staff Activity: This week, members of the Board's staff held separate teleconferences with NNSA Field Office and Environmental Management (EM) Field Office personnel to discuss the staff's observations on its review of federal oversight.

Area G: On Monday, N3B transmitted to the EM Field Office for approval the annual update to the existing Area G safety basis, which is a Basis for Interim Operations rather than a more modern Documented Safety Analysis. In July, the EM Field Office and EM Headquarters rejected a previous submittal and directed that N3B submit a revised document that incorporated the Justification for Continued Operations related to headspace gas sampling (see 6/18/2021 report) and the safety analysis and credited hazard controls for the Flanged Tritium Waste Container venting activity (see 4/16/2021 report). The new revision includes other changes to address EM review comments such as noting activities (e.g., drum venting and retrieval from trenches) that will not be performed until a modern safety basis is developed. EM personnel are evaluating the revised submittal.

On Wednesday, N3B management paused all vehicle usage due to a series of vehicle incidents at their sites. One impact occurred Tuesday in Area G where a vehicle impacted a jersey barrier outside of a waste storage dome. The impact barrier was not one of the credited safety-class vehicle barriers to protect high-risk locations. An engineering incident discovered no positional change or damage to the barrier following the impact. N3B previously paused work due to vehicle concerns in January (see 1/29/2021 report). Management is evaluating whether corrective actions from that timeframe remain effective.

Plutonium Facility–Safety Basis: On Thursday, the NNSA Field Office transmitted a letter to Triad requesting a resubmittal of the Evaluation of the Safety of the Situation (ESS) related to the July overflow of water in the Plutonium Facility (see 9/10/2021 report). NNSA provided six comments that needed to be addressed in a revised ESS. Those comments include requesting that the ESS provide: an evaluation for potential water entry into all systems that vent to the Zone 1 ventilation system, a full consideration of overflow paths from both active and inactive chilled water and wet vacuum systems, and a clear discussion of future deliverables to address the problem including any engineering modifications or safety submittals. The Field Office requested a response by October 1, 2021.

Safety Basis: Last Tuesday, Triad transmitted to the NNSA Field Office a revision of their Unreviewed Safety Question (USQ) process intended to address the condition of approval from the May approval of the revised process (see 5/14/2021 report). The resubmittal notes that the New Information process is 'associated with' rather than 'separate from' the USQ process in response to the condition of approval that directed the procedure be revised to note that the New Information Process is a part of the USQ process. NNSA is evaluating whether the changes address their concern with the previous submittal.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 1, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: P. Migliorini, Acting Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending October 1, 2021

DNFSB Staff Activity: P. Migliorini was onsite performing resident inspector duties. While onsite, the acting resident inspector performed walkdowns of Area G and the Plutonium Facility.

On Wednesday, a staff team held a remote interaction with Triad and NNSA Field Office personnel to discuss the ongoing upgrade to the Plutonium Facility leak path factor methodology (see 8/28/2020, 2/26/2021, and 5/28/2021 reports). The leak path factor is used to quantify the building's ability to confine radioactive materials during an accident scenario and is particularly important for the evaluation basis earthquake event that the active confinement ventilation system is not credited to survive. The upgraded leak path factor methodology is a key supporting analysis for the new DOE Standard 3009-2014 compliant safety basis that Triad plans to submit for approval in March 2022.

Plutonium Facility–Infrastructure: Last week, Triad submitted to the NNSA Field Office for concurrence a major modification determination for the Plutonium Facility Equipment Installation Phase 2 (PEI2) subproject. PEI2 will install new gloveboxes and equipment in the Plutonium Facility to provide enduring analytical chemistry and materials characterization capabilities that support plutonium pit production and other plutonium missions. Triad safety basis analysts determined that while PEI2 may introduce process changes, the changes do not generate hazards outside of the existing Plutonium Facility safety basis. Accordingly, Triad safety basis concluded that PEI2 is not a major modification to the existing facility. Triad plans to revise the project safety design strategy to reflect the negative major modification determination.

Area G: On Thursday, N3B transmitted to the Environmental Management Field Office an interim draft of a DOE Standard 3009-2014 compliant safety basis for Area G. This submittal is intended to meet one of the performance-based incentives for the fiscal year 2021 Los Alamos Legacy Cleanup Contract. The interim draft safety basis includes placeholders for important aspects that still need to be developed, such as mapping safety controls to specific hazard scenarios and finalizing performance criteria for safety controls. N3B plans to submit the final draft safety basis in February 2022. Following implementation, this modern safety basis will replace the outdated basis for interim operation.

On Thursday, the acting resident inspector walked down the domes that currently house the transuranic waste containers with potentially reactive materials that are associated with DNFSB TECH-46. The containers are protected from direct impacts by robust barriers (e.g., stacked and banded metal pallets or standard waste boxes) and from fire hazards by administrative controls. Once the approved justification for continued operation (see 9/3/21 report) is implemented, 12 containers will remain in their current location and 21 containers will be moved to Dome 33, which has a non-credited fire suppression system, until remediation or additional historical information can demonstrate that they do not contain reactive materials.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 8, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending October 8, 2021

Plutonium Facility–Criticality Safety: Over the past month, facility personnel have discovered and reported several instances where extraneous materials such as construction or radiological control supplies were stored on or around nuclear material safes in the basement. Controls listed on the criticality safety postings vary by safe, but many include a requirement to keep an area of six inches around the safe clear. Following one such discovery in September, personnel added operator aids to the safes to provide additional clarity to facility residents that materials are not allowed close to certain safes. So far, all these instances where the spacing control was violated have not included enough reflective materials to approach the analyzed condition for neutron reflection around the safes. On Wednesday, the resident inspector and an NNSA facility representative observed portions of a Triad walkdown of basement safe conditions. At the time, one safe had a welding curtain propped against it, and several had miscellaneous items sitting on their tops. Facility personnel are working on methods to prevent these occurrences. This is a challenge given the rapid increase of staffing in the facility especially of construction and craft forces who are not trained on criticality safety postings to the same level as fissile material handlers. In the near term, facility management plans to mark areas where no material is allowed with painted no storage zones on the floor and rope them off. Longer term, they are evaluating engineered controls such as a physical cage around safes to help ensure compliance with the spacing requirement. Additional training and lessons learned, especially for personnel who are not fissile material handlers is also planned.

Plutonium Facility–Safety Basis: Last Friday, Triad submitted to the NNSA Field Office for approval a revision to the safety basis for the Plutonium Facility. This revision includes a reanalysis of the seismic accident, reapportionment of material at risk, and a downgrade of the seismic power shutoff system from safety-class to other hazard control (see Board Letter 6/9/2021). The seismic accident change includes the removal of three specific post-seismic fire initiation locations with molten plutonium. As all gloveboxes containing molten plutonium have been seismically upgraded, they are no longer considered a credible fire initiation source. A randomly initiated post-seismic fire location remains in the analysis. With this reduction in post-seismic fire consequences, the locations of material at risk have been reapportioned to support the facility mission. The seismic power shutoff system, an active system, now has its credited safety function being performed by the passive system of seismically credited glovebox stands that reduce the likelihood of heat producing equipment from spilling even if powered.

Flanged Tritium Waste Containers (FTWCs): N3B recently submitted the annual update to the Area G safety basis that covers FTWC venting activities (see 9/24/2021 report). Approval and implementation of this safety basis is expected before the end of the year and is a key prerequisite for Triad personnel to perform the venting activities. This week, Triad personnel resumed practice for the venting activity at the mockup area in Technical Area 49. They have also procured a new portable generator with a smaller fuel capacity in order to ensure compliance with the liquid fuel limits at Area G. Another activity that must be completed prior to commencing the actual venting activity is a demonstration for the federal readiness assessment team given the gap between assessment and performance (see 11/13/2020 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 15, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending October 15, 2021

Area G: On Monday, a four member team commenced an Implementation Verification Review for four recently approved Justifications for Continued Operations (JCO) that apply to a variety of topics including potentially energetic drums, sealed sources, mobile crane and forklift operations, and fire events (see 9/3/2021 report). Implementing this set of JCOs adds 44 new specific administrative controls. This week the team conducted numerous personnel interviews, observed field conditions, and assessed performance of new surveillances. The review is expected to be completed next week.

On Wednesday, N3B personnel performed a full mockup demonstration of transuranic waste activities in the Building 412 contamination enclosure. Drum liner and repackaging activities have not been performed in Building 412 for almost a year due to safety basis issues. This mockup activity was intended to demonstrate continued proficiency in performing this activity, similar to the mobile loading demonstration in August (see 8/27/2021 report).

Flanged Tritium Waste Containers (FTWCs): Last Friday, Triad entered their new information process to determine the safety basis implications of additional decay time from the date assumed in a supporting pressure calculation. Given the decay rate of tritium, the new calculated pressure may be higher and impact standoff distances or other controls to protect workers from FTWC over pressurization or deflagration. This affects three Triad safety basis documents for venting FTWCs at Area G, transporting FTWCs from Area G to the Weapons Engineering Tritium Facility (WETF), and storing FTWCs at WETF. The N3B-owned safety basis annual update that addresses FTWC venting at Area G has not been approved and implemented yet. N3B personnel determined that their current controls on storage are not impacted, and are awaiting the results of Triad's evaluation to see what changes may need to be incorporated in the recently submitted annual update.

Radioactive Laboratory Utility Office Building (RLUOB): Last Thursday, Triad transmitted to the NNSA Field Office their major modification determination for equipment installation in RLUOB supporting its transition to a hazard category 3 nuclear facility. They concluded that the installations do not constitute a major modification. The determination notes that the equipment being installed is for processes that are already described in the hazard category 3 safety basis and will not introduce new hazards.

Chemistry and Metallurgy Research Building (CMR)–Infrastructure: On Tuesday, the NNSA Field Office unconditionally approved the safety basis addendum for the planned outdoor ventilation skid that will replace the capabilities of a failed fan within the currently inactive Wing 3 (see 9/10/2021 report). Facility personnel have started developing work documents to perform the installation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 22, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending October 22, 2021

Plutonium Facility: On Tuesday, Triad personnel declared a violation of the Technical Safety Requirements (TSR) for the Plutonium Facility due to a breach of a confinement boundary without entering the appropriate limiting condition for operation (LCO). Workers have been installing pressure and velocity measurement instruments in the ventilation system to collect data for future upgrades. The installation involves opening ports in ductwork which breaches the credited confinement boundary. They performed several of these installations starting last week without entering the LCO before a review of logs identified the issue. The controlling work document for the installation notes it breaches a confinement boundary and has a hold point to inform the operations center of the potential for TSR impact although it does not explicitly state that the appropriate LCO must be entered prior to breaching the system. Miscommunication between operations center personnel and the crew performing the work resulted in a failure to recognize the need for LCO entry. Following discovery of the error, facility personnel measured differential pressures and verified the confinement boundary was intact. Facility management is evaluating their work control processes to find opportunities for improved work package review and release to avoid this type of error in the future.

Last week, following decontamination efforts, facility workers identified a steady drip of liquid from the wet vacuum system involved in the July overflow event (see 7/23/2021 report). The system resides in a room posted as a high contamination area/airborne radioactivity area. The exact source of the liquid is not currently known, although it was postulated that the source is related to the overflow event and may be holdup in the system. Swipes of the area indicate that it is highly contaminated consistent with other sampling related to the overflow event. The impacts of this liquid of questionable provenance will be assessed in the continued development of the Evaluation of the Safety of the Situation and upcoming modifications to the system (see 9/24/2021 report).

Area G: On Wednesday, the Implementation Verification Review team for four recently approved Justifications for Continued Operations (JCO) briefed their results to Environmental Management and N3B personnel (see 10/3/2021 report). They identified eleven pre-implementation findings, two post-implementation findings, nine observations, and two noteworthy practices. Several of the findings involve management of hydraulic oil as a potentially combustible liquid. One noteworthy practice involved the use of flashcards to train the workforce on the numerous new controls. The resident inspect concurs that this was a noteworthy practice as he frequently observed that most workers had their cards on hand and frequently reviewed them or quizzed each other.

Emergency Management: On Tuesday, the NNSA Field Office sponsored a wildfire workshop. Field Office, Triad, and Los Alamos Fire Department personnel discussed impacts and lessons learned from previous major wildfires impacting the laboratory and surrounding communities. They also described current prevention and preparedness activities including fuel mitigation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 29, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending October 29, 2021

Plutonium Facility: On Thursday, the NNSA Field Office conditionally approved a safety basis addendum for the Plutonium Facility pertaining to missile barriers to protect confinement doors (see 6/25/2021 report). The addendum uses an adjacent structure as credited protection from wind borne missiles for both confinement doors on one side of the building. Previously, this approach had only been taken for one of the doors. The NNSA approval included two conditions of approval and three directed changes. The conditions of approval were to add a discussion of the impacts of indirect natural phenomena hazard events and to include an in-service inspection of the structure acting as a safety-class missile barrier in the Technical Safety Requirements.

Transuranic Waste Management: This week, Triad personnel performed a transuranic waste mobile loading activity in Technical Area 55. They received and unloaded TRUPACTs with standard waste boxes from Sandia National Laboratory containing items from plutonium experiments performed there. These will later be moved to Area G for storage and eventual certification to be disposed of as transuranic waste at the Waste Isolation Pilot Plant (WIPP). The TRUPACTs were then reloaded with Triad-owned transuranic waste to ship to WIPP.

Area G: On Thursday, N3B personnel conducted an operations-based emergency management drill in Dome 231. The scenario was a fire during glovebag operations within the Dome 231 Perma-Con. Between the reduction in field drills due to COVID-19 and new hiring, this was the first field drill for approximately one third of the participants. Preparations for startup of glovebag operations were put on hold due to the safety basis issues at Area G following the contractor readiness assessment last year (see 12/11/2020 report). With implementation of the fixes to the safety basis in process, N3B personnel are resuming preparations to restart glovebag operations and other paused activities such as Corrugated Metal Pipe retrieval. Given the substantial time since the contractor readiness assessment, the Environmental Field Office directed that N3B reperform an appropriately scoped contractor readiness review prior to DOE performing the Federal readiness review.

Two weeks ago, N3B submitted to the Environmental Management Field Office for approval a Justification for Continued Operations (JCO) to address movement of unvented transuranic waste drums. The JCO stems from two potential inadequacies of the safety analysis: one from February pertaining to an inappropriate control during unvented drum movement (see 2/19/2021 report) and the other from April about horizontal sympathetic deflagrations of unvented drums (see 4/30/2021 report). The JCO proposes a series of interim controls for movement of unvented drums including using a critical lift plan. There are no new controls proposed for sympathetic deflagrations as they conclude that a horizontal sympathetic deflagration is bounded by an existing design basis accident.

Radiological Laboratory Utility Office Building (RLUOB): The NNSA Field Office concurred with Triad's conclusion that equipment installation in RLUOB supporting its transition to a hazard category 3 nuclear facility does not constitute a major modification (see 10/15/2021 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 5, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending November 5, 2021

Plutonium Facility–Infrastructure: The resident inspector joined Triad personnel to observe off-shift deactivation and decommissioning and construction activities supporting the 30 pit per year mission. Of note, Triad personnel have begun planning for the removal of a more challenging glovebox than other recent removals that have been disconnected, wrapped, and removed without significant issues. Given its size and weight, this box will likely require some in-situ size reduction in an actively used processing room. Triad is currently evaluating several options for performing the activity while controlling contamination and meeting other requirements. Triad is also actively removing equipment and concrete pads in the basement to clear space in what remains a congested location. This process generates a substantial volume of low-level waste. Keeping up with waste generation remains a challenge in the facility. Waste removal activities were in progress Wednesday morning and personnel were actively loading a waste box with bags of concrete debris.

Plutonium Facility–Safety Basis: Last week, Triad submitted to the NNSA Field Office both another extension request for the current Evaluation of the Safety of the Situation (ESS) for overpressurization of sealed sources in the Plutonium Facility and a new revision to the ESS. The current ESS has been in place since December 2019 and stems from an August 2019 potential inadequacy of the safety analysis (see 9/20/2019 report). The new revision attempts to address concerns from the NNSA Field Office. It includes additional justification for the choices of airborne release fractions/respirable fractions and a limiting condition for operation for application of new multiplication factors for analysis of materials releases.

Radioactive Liquid Waste Treatment Facility (RLWTF): Over the past month, there have been three air-hose disconnects during doffing of powered air purifying respirators (PAPR) at RLWTF. These incidents have all been for the same job involving almost two hundred total respirator entries into a containment tent. Facility personnel leveraged the DOE Operating Experience system and noted their issues appears similar to a problem at the Y-12 National Security Complex in 2019. They believe that extra attention to properly taping up the respirators and formally documenting that in work instructions will resolve the issue. The activity is paused until corrective actions are incorporated into work practices.

Radiological Laboratory Utility Office Building (RLUOB): The NNSA Field Office conditionally approved an equivalency to DOE-STD-1066, *Fire Protection*, for HEPA filter deluge systems in RLUOB. The facility currently includes such a system, however Triad proposed removing it per the provision in the DOE standard that allows for a technically justified alternative approach. They are using a computational fluid dynamics model to demonstrate that dilution air is sufficient to keep filter temperatures below requirements in lieu of the deluge system. NNSA's approval letter includes five conditions of approval largely related to assuring formal control of the modeling assumptions and other facility conditions related to the equivalency.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 12, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending November 12, 2021

Transuranic Waste Management–Safety Basis: On Tuesday, Triad personnel entered their new information process to re-evaluate the safety basis implications of transuranic waste containers with nitric acid and polysaccharides at the Plutonium Facility, the Transuranic Waste Facility (TWF), the Chemistry and Metallurgy Research Building (CMR), and the RANT Shipping Facility. This was in response to the Board’s September 8, 2021 letter regarding the technical basis for the Carlsbad Field Office accepting such waste at the Waste Isolation Pilot Plant. They had concluded that such mixtures were acceptable and no longer a reactivity hazard if they have been aged for a sufficient amount of time. Triad has previously evaluated this issue and is re-evaluating it in light of the Board’s letter. Triad currently has specific administrative controls at CMR and the Plutonium Facility that prohibit waste containers from containing polysaccharides and greater than 12 molar nitric acid. The Radiological Laboratory Utility Office Building also includes such a prohibition in its safety basis to support future Hazard Category 3 operations. TWF and RANT have broader specific administrative controls prohibiting them from receiving potentially reactive waste drums as defined in the waste acceptance criteria for the Waste Isolation Pilot Plant.

Plutonium Facility–Operations: Last week one of the trolley cables failed in the Plutonium Facility. The trolleys are a critical piece of infrastructure that support movement of materials between gloveboxes and rooms without the need for bagging materials out. Facility personnel were testing the system following an upgrade to the trolley controller. After raising the bucket, the cable snapped, and the bucket fell to the floor of the drop box. There were no injuries or damage to glovebox gloves as no workers had their hands in the box, and all glovebox gloves were secured outside. Initial inspections indicated no damage to the glovebox. The trolley bucket is damaged, although it is not currently known whether this is from the fall. Facility personnel are evaluating the failure mechanism and planning for replacement of the failed components.

Radiological Laboratory Utility Office Building (RLUOB): On Monday, an eighteen-member team including several independent personnel from non-Triad organizations commenced the Management Self-Assessment for upgrading RLUOB to a Hazard Category 3 nuclear facility to be known as PF-400. The team expects to issue their final report in December. Following completion of this self-assessment, there will be additional readiness reviews including a contractor operational readiness review currently planned for late February 2022 and a Federal operational readiness review in early May 2022 to support a late June upgrade to Hazard Category 3.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 19, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending November 19, 2021

Transuranic Waste Facility (TWF): On Monday, TWF personnel identified that they had not completed three required monthly surveillances supporting compliance with the facility's Technical Safety Requirements (TSR) within the required timeframe. The surveillances involved verifying compliance with requirements on outdoor combustibles, outdoor equipment, and banding of drums on the third tier of stacked arrays. Soon after discovering the issue, facility personnel performed the surveillances with satisfactory results. The performance delay was within the 25% extension that is allowed by the TSR. Facility management is evaluating means to prevent recurrence of missed TSR surveillances including improving surveillance scheduling processes.

Weapons Engineering Tritium Facility (WETF): Off shift early on Monday, the fire department and facility duty officer responded to a fire alarm at WETF. They discovered the alarm was due to water flow and found evidence that the flow had come from a fire riser drain. They reset the system after sweeping the facility. A few hours later, the system alarmed again. This time, the responders found active flow from the drain. To evaluate and repair the system, the facility entered the limiting condition for operation for the safety significant wet-pipe fire sprinkler system being inoperable which initially requires a fire watch. Spare parts to repair the system were on hand, and it has been repaired. The leak appeared to be the result of a missing bolt in the alarm check valve. Further investigation to determine if the bolt is held up in the system is planned.

Plutonium Facility–Safety Basis: Last week, Triad submitted to the NNSA Field Office for approval the Evaluation of the Safety of the Situation and Justification for Continued Operations (ESS/JCO) pertaining to the potential inadequacy of the safety analysis and positive unreviewed safety question that stemmed from the July overflow event (see 8/6/2021 report). The submittal includes an extent of condition evaluation to determine what other systems could pose a risk of an overflow event. Operational restrictions on these systems remain in place and are elevated to TSR-level through the proposed ESS/JCO.

Area G: On Thursday, N3B personnel performed another operations-based emergency drill for glovebag operations in the Dome 231 Perma-Con (see 10/29/2021 report). The scenario involved a medical emergency for a worker performing transuranic waste operations in the glovebag. The participants exercised practices for balancing radiological control and a medical emergency within an airborne radiation area. One key item uncovered during the drill was that the automated external defibrillator the participants obtained had not been surveilled and needed a new battery.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 26, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending November 26, 2021

Plutonium Facility–Safety Basis: Triad is developing a safety basis addendum to support a future campaign for receipt and processing of additional heat source plutonium materials in the Plutonium Facility. The nature of this activity will result in mitigated public dose consequences from a post-seismic fire event that are expected to exceed the 25 rem TED evaluation guideline from DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*. NNSA Headquarters and Field Office personnel are preparing to use the process described in DOE-STD-1104-2016, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*, for review, approval, and risk acceptance of this activity. The NNSA Field Office Manager will make the recommendation for approval of the addendum to the cognizant NNSA Program Secretarial Officer who will serve as the safety basis approval authority, with concurrence from the NNSA Central Technical Authority.

Area G: Last week and on Monday, N3B personnel executed the movement of several problematic containers associated with the recently approved and implemented justifications for continued operations (see 10/15/2021 report). In total, N3B personnel moved 24 containers from Domes 48, 49, and 375 to Dome 33. Of note, 21 containers contain waste with the potential for energetic chemical reactions and are associated with DNFSB TECH-46, *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at Los Alamos National Laboratory*. Three of these containers also have contents with high fissile gram equivalents. The other three containers moved were pipe overpack containers with material-at-risk greater than 80 plutonium-239 equivalent curies. Facility personnel briefed the work crew last Thursday afternoon to explain why the drums were being moved, review the applicable controls from the justifications for continued operations, and review criticality safety requirements. The work commenced on Friday, continued through Saturday, and completed on Monday. The activity proceeded smoothly according to the planned sequence of moves with one exception due to an error in the waste tracking software.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF): On Tuesday, Triad submitted to the NNSA Field Office for concurrence a safety basis strategy for developing a new documented safety analysis to operate WCRRF as a hazard category 3 nuclear facility. WCRRF is currently a hazard category 2 nuclear facility and has been in cold standby for approximately three years. The new mission for WCRRF will be to size-reduce large metal objects (e.g., gloveboxes removed from the Plutonium Facility) and repackage them as either transuranic or low-level waste. The safety basis strategy notes that material-at-risk in the facility will be limited such that unmitigated dose consequences due to a building collapse and fire will not exceed the thresholds for identifying safety class or safety significant controls. While the facility will not have any credited safety controls, the safety basis strategy identifies existing hazard controls (e.g., fire suppression system, ventilation system, lightning protection system) and notes that Triad is evaluating options for performing size reduction activities in a radiological protection enclosure (e.g., the existing glovebox enclosure, a Perma-Con, or containment tent). Triad plans to submit a draft safety basis in August 2022.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 3, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending December 3, 2021

DNFSB Staff Activity: On Tuesday, a staff team held a remote interaction with Triad and NNSA Field Office personnel to discuss the staff's observations from its review of the ongoing upgrade to the Plutonium Facility leak path factor methodology (see 10/1/2021 report).

Plutonium Facility–Safety Basis: On Tuesday, Triad submitted to the NNSA Field Office for approval the safety basis addendum supporting receipt of large shipments of heat source plutonium (see 11/26/2021 report). The addendum would allow an increase to material-at-risk limits as this activity will exceed the current first floor and glovebox limits until repackaged in credited containers. The mitigated public dose due to the bounding post-seismic fire accident is estimated to be a range from 83 to 378 rem because there is substantial uncertainty regarding the leak path factor that can be appropriately applied to the scenario. The increased doses are applicable during the time when the new material is not in credited containers. As this exceeds the DOE evaluation guideline of 25 rem to the public, Triad is requesting that NNSA accept the risk involved with performing this mission. The addendum includes an attachment outlining how Triad addressed the evaluation criteria from DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, for existing facilities with greater than 25 rem mitigated doses. This includes a discussion of potential controls and why they were unable to be used and credited to further reduce mitigated dose. NNSA has established a headquarters and field office safety basis review team to evaluate the submittal.

Last week, the NNSA Field Office unconditionally approved the revision to the Plutonium Facility safety basis that includes reanalysis of the post-seismic fire accident and downgrade of the seismic power shutoff system, which has known vulnerabilities in meeting the requirements for a credited safety class system (see 10/8/2021 report). The approval letter noted that Triad should evaluate known upcoming changes to the safety basis prior to implementation and if a future change would require re-implementing the seismic power shutoff system as a credited control, they should consider retaining it as a credited system. It is not currently proposed as a control for the heat source plutonium addendum described above.

Area G–Safety Basis: Last week, the Environmental Management Field Office transmitted to N3B a letter directing they revise the safety basis strategy for developing a modern Area G safety basis to incorporate DOE comments on the previous revision (see 3/19, 5/14/2021 reports).

Transuranic Waste Management: Triad personnel have completed their re-evaluations of the safety basis implications of transuranic waste containers with nitric acid and polysaccharides at the Plutonium Facility, the Transuranic Waste Facility, the Chemistry and Metallurgy Research Building (CMR), and the RANT Shipping Facility (see 11/12/2021 report). They concluded that the only facility with a potential inadequacy in the safety analysis is the RANT shipping facility as it can receive waste from locations without existing Specific Administrative Controls prohibiting such waste as TA-55 and CMR do. Triad is establishing operational restrictions on nitric/polysaccharide waste at RANT and concluded that the potential inadequacy in the safety analysis constitutes a positive unreviewed safety question.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 10, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending December 10, 2021

DNFSB Staff Activity: Staff members W. Dumayas, P. Migliorini, P. Natividad, and J. Plaue were on site to perform a review of construction quality lessons learned for fire protection features from the Radiological Laboratory Utility Office Building and the Transuranic Waste Facility. The staff toured both facilities as part of the review and also went to the Weapons Engineering Tritium Facility, the Emergency Operations Center, and joined DOE Environmental Management headquarters personnel at Area G.

Area G–Safety Basis: Last week, Environmental Management Field Office and headquarters personnel conditionally approved the annual update to the Area G safety basis (see 9/24/2021 report). The three conditions of approval were: to evaluate fixed and rotary wing aircraft crashes to address issues stemming from the potential inadequacy of the safety analysis early this year and update the safety basis per the results of said analysis (see 3/26/2021 report), enter a written agreement between N3B and Triad to maintain a 1500-foot helicopter standoff distance from Area G, and a prohibition on venting and handling activities for the Flanged Tritium Waste Containers until revised calculations are completed and incorporated into approved and implemented safety basis documents.

The Environmental Management Chief of Nuclear Safety and members of their staff were on site along with members of the contractor’s reachback team supporting development of a modern safety basis for Area G (see 12/3/2021 report). The Board’s staff joined them on a full walkthrough of Area G. Focus areas of the walkdown included: current and planned waste operations including upcoming corrugated metal pipe and glovebag activities; desired approaches for control implementation from the workforce to complete their mission effectively; and the current condition of the facility following implementation of the four Justifications for Continued Operations and the movement of many drums of concern to Dome 33 (see 11/26/2021 report).

Transuranic Waste Management: Triad personnel briefed the NNSA Field Office on their recommendation for re-establishing the capability to remediate oversized, non-compliant waste containers or difficult waste streams including treatment, repackaging, or removal of prohibited items. They recommended using the Waste Characterization, Reduction, and Repackaging Facility (WCRRF) under a new hazard category 3 safety basis (see 11/26/2021 report). Other options considered included: working with N3B to perform the work at Area G, performing the work in the Plutonium Facility, using the Chemistry and Metallurgy Research Building, building a new nuclear facility, or transporting items offsite for treatment. NNSA is evaluating Triad’s recommendation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 17, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending December 17, 2021

DNFSB Staff Activity: On Monday, Triad personnel remotely briefed members of the Board's staff on the interim risk assessment results for the Plutonium Facility Seismic Performance Reassessment Project. The interim risk results suggest that the facility will be able to meet seismic design category 3. Triad is proposing to wait for the updated site probabilistic seismic hazard analysis to be completed before performing a reduced-scope final risk assessment. The final risk assessment is expected to be completed within two years.

Severe Weather: On Wednesday, the laboratory and surrounding region experienced a severe weather event with high winds and wintry precipitation. Unstable electrical power and outages occurred throughout the laboratory. The main impacts to nuclear facilities were power losses at Area G where two utility poles came down, the Weapons Engineering Tritium Facility, and the RANT Shipping Facility. The Emergency Operations Center also lost power and ran on its backup generators. All nuclear facilities, the Emergency Operations Center, and most other laboratory buildings had power restored by the end of Wednesday.

Federal Oversight: On Thursday, NNSA Headquarters personnel and a supporting contractor briefed Triad on the Safety, Analytics, Forecasting, Evaluation, and Reporting (SAFER) effort. SAFER is a software tool for collecting, managing, and viewing data from numerous input sources. NNSA has started populating the tool at sites across the complex to assist in their oversight. At the laboratory, NNSA is currently focusing on populating the tool in the functional areas of fire protection, maintenance, electrical safety, radiation protection, and safety basis. NNSA intends for Triad to be the first management and operating contractor to pilot using the tool to aid data management on the contractor side.

Plutonium Facility–Safety Basis: Last week Triad responded to the NNSA Field Office's request for an impact assessment for incorporating DOE-STD-5506-2021, *Preparation of Safety Basis Documents for Transuranic Waste Facilities*, into the modern TA-55 safety basis under development (see 9/17/2021 report). Their new schedule estimates an impact that delays final submittal of the new safety basis from November 2022 to January 2023. Other factors had shifted planned submittal from March 2022 to November 2022.

Emergency Management: The NNSA Field Office transmitted to Triad the assessment report on emergency preparedness capabilities at the lab from the DOE Office of Enterprise Assessments. They requested Triad provide a corrective action plan to address the findings in the report. The assessment covers the five year period from October 2015 through September 2020. The first finding was that Triad has not established or maintained an adequate site-level exercise program to validate all its emergency response capabilities for identified hazards. Many of the capabilities that have not been demonstrated recently involve interface with other organizations such as regional hospitals. The second finding was that Triad has not self-identified an accurate status on the readiness and effectiveness of its response capabilities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 24, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending December 24, 2021

Plutonium Facility–Safety Basis: The NNSA Field Office responded to Triad’s latest revision of the Evaluation of the Safety of the Situation (ESS) for overpressurization of sealed sources in the Plutonium Facility (see 11/5/2021 report). They noted that they will not approve the ESS until provided comments are addressed. Notable comments from the field office included: concern with the application of multiplication factors to material release events, and several related to reliance on combustible loading controls from the fire protection program.

Last week, NNSA Office of Safety and Field Office personnel informally provided Triad with initial comments on the safety basis addendum supporting the receipt of large shipments of heat source plutonium (see 12/3/2021 report). Topics include: the consistency of the safety basis document with the specifications and test report for the containment vessel; compliance with DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*; and interface with the ESS discussed above. NNSA requested to discuss these comments with Triad early next year.

Radiological Laboratory Utility Office Building (RLUOB)/PF-400: Triad submitted to the NNSA Field Office for approval a revision to the hazard category 3 safety basis for PF-400 and a revised safety design strategy. The revised safety basis is intended to address issues from the recent Implementation Verification Review (see 9/3/2021 report).

Chemistry and Metallurgy Research Building (CMR): Last week, a radiological control technician discovered contamination in a radiologically uncontrolled area of CMR during a routine survey. They controlled the location and contacted personnel who may have walked through the area. They cleaned the area and verified that there was no further contamination spread. Analysis of the contamination found that it was americium-241 which was not an expected isotope for that portion of the facility. Facility personnel are attempting to determine the provenance of the contamination and are evaluating their routine survey requirements for uncontrolled areas. The evaluation will also be informed by the shift in activities in some wings to more invasive deactivation and decommissioning. This contamination was discovered outside of a wing undergoing equipment removal.

Federal Oversight: NNSA Field Office staff showed the resident inspector some of the current capabilities for using the Safety, Analytics, Forecasting, Evaluation, and Reporting (SAFER) software tool for facility oversight (see 12/17/2021 report). Available information varies widely by module as the system is still being built and populated with relevant data.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 31, 2021

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending December 31, 2021

Year in Review: A summary of the key developments of 2021.

- The pace of work in the Plutonium Facility continued to increase, especially construction work on the backshift when many of the equipment removals and upgrades to support the 30 pit per year mission take place. Triad is working to support a large influx of workers including providing the substantial training and conduct of operations mentoring needed to work safely and effectively in a nuclear facility.
- This marked the first year for comingled shipments of NNSA managed and Environmental Management transuranic waste from the RANT Shipping Facility. Comingling shipments allows for more efficient building of payloads. Despite safety basis issues at Area G and the titanium event at the Plutonium Facility, Triad and N3B completed more than fifty shipments to the Waste Isolation Pilot Plant this calendar year. These shipments included more than a thousand waste containers and exceeded the generation rate of transuranic waste at the lab.
- N3B curtailed transuranic waste operations at Area G following the identification of several potential inadequacies of the safety analysis. Many of these were discovered through a detailed extent of condition review of the current safety basis directed by the Environmental Management Field Office. N3B personnel have been addressing the weaknesses in the current safety basis and have re-established much of their mission work under controls from a series of Justifications for Continued Operations. Meanwhile, a modern safety basis for Area G is still under development.
- Triad and N3B both experienced challenges addressing potentially reactive transuranic waste containers as discussed in DNFSB-TECH-46, *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at Los Alamos National Laboratory*. By the end of the year N3B had identified the set of containers they were most concerned about in terms of potential reactivity and are managing them under new controls. Triad experienced an unexpected titanium powder sparking while loading a waste drum in the Plutonium Facility and performed a causal investigation which generated many corrective actions to improve waste generation and handling.
- The multi-year effort to establish the fire suppression system at the Transuranic Waste Facility as safety-significant continued with the approval of a new safety basis. Implementation is planned to be completed in January 2022.
- Triad continued efforts to transition the Radioactive Laboratory Utility Office Building to a Hazard Category 3 nuclear facility to be known as PF-400. This year they performed an Implementation Verification Review of the new safety basis and commenced a Management Self Assessment to support federal and contractor Operational Readiness Reviews next year.
- Progress on venting the Flanged Tritium Waste Containers stored at Area G stalled this year partly due to the safety basis issues at Area G and permitting delays.
- Both the Environmental Management and the NNSA Field offices again welcomed new site managers in 2021.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 7, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for Week Ending January 7, 2022

Area G–Safety Basis: Last month, the Environmental Management Field Office and Headquarters personnel approved N3B’s Justification for Continued Operations (JCO) for the potential inadequacies of the safety analysis (PISA) related to unvented transuranic waste drums movements and horizontal sympathetic deflagrations in unvented drums (see 10/29/2021 report). While there were no conditions of approval or directed changes in the Safety Evaluation Report, the transmittal letter formally noted that the duration of the JCO will not exceed one year rather than being in place until a modern safety basis for Area G is approved and implemented. This is the fifth and final JCO developed to address the 23 PISAs identified against the Area G safety basis in 2020 and early 2021.

Emergency Management: The NNSA Field Office approved Triad’s annual Emergency Readiness Assurance Plan and submitted it to NNSA Headquarters. This year, the plan discusses some of the challenges to emergency management due to the COVID-19 pandemic and the relief granted by DOE to many requirements during the pandemic. Also of note, fiscal year 2021 was the final year in the five-year implementation process of DOE Order 151.1D, *Comprehensive Emergency Management System*, at the site. Once the NNSA Field Office approves a few remaining Emergency Management Planning Assessments which are currently under review, implementation will be complete.

Federal Oversight: The Resident Inspector joined the NNSA Site Manager and other Field Office personnel in a tour of the Weapons Engineering Tritium Facility (WETF). Key topics addressed during the visit included disposition of Flanged Tritium Waste Containers (FTWCs), and the upcoming Plutonium Coupon Studies (see 8/6/2021 report). WETF currently stores two potentially pressurized FTWCs that are slated for venting; one FTWC in this category was vented and unloaded in 2019. The facility also has two FTWCs that are not potentially pressurized but are overloaded and must have their contents split and distributed to additional containers prior to shipment offsite as waste. The four potentially pressurized FTWCs at Area G are planned to be vented there, then transported to WETF in spring of this year. For the Plutonium Coupon Studies, WETF personnel discussed the new safety basis controls and showed the location of the filter in the tubing manifold that is intended to protect WETF tritium systems from inadvertent plutonium contamination.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 14, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 14, 2022

DNFSB Staff Activity: J. Plaue completed his headquarters assignment and returned to regularly assigned duties as a Resident Inspector.

Plutonium Facility–Glovebox Safety: Last Friday, an airborne release of radioactive material occurred in a laboratory room while workers were executing a repack, consolidate, and discard activity. Specifically, a worker finished sizing a legacy container of nuclear material for a new overpack, withdrew their arms from the glovebox, and detected contamination during standard monitoring. Moments later, continuous air monitors sounded, and all six workers evacuated the room according to procedure. Radiological control technicians responded and identified contamination on areas of the personal protective equipment, face, and heads of two workers—they were subsequently successfully decontaminated. However, nasal swabs indicated potential radiological intakes of one of the contaminated workers, as well as two other workers who were in the room. All six workers were placed on special bioassay. Yesterday, the NNSA Cognizant Secretarial Officer for Safety appointed a formal Accident Investigation Board in accordance with DOE Order 225.1b, *Accident Investigations*. This decision was based on the NNSA’s determination that the potential exposure levels exceed the investigation criterion of a confirmed monitoring result indicating an intake of two or more times the annual limit on intake. Because bioassay results are not yet available, the confirmed monitoring result was based on the concentrations of airborne radioactive material detected by air monitoring equipment.

Plutonium Facility–Safety Basis: The NNSA Field Office formally responded to Triad’s submittal of a combined justification for continued operations/evaluation of the safety of the situation pertaining to the potential inadequacy of the safety analysis resulting from the July overflow event (see 11/19/2021 report). NNSA directed that Triad resubmit the document after addressing numerous review comments.

Area G: On Monday, a five-member contractor team commenced a readiness assessment for resumption of drill and drain and glovebag operations in the Dome 231 Permacon. These activities underwent a contractor readiness assessment in late 2020; however, safety basis issues at Area G curtailed nuclear operations prior to the completion of the federal readiness assessment. As a result, the Environmental Management Field Office directed N3B to perform a new readiness assessment scoped to account for the previous review prior to an upcoming federal assessment. This week’s review included cold performance demonstrations of both drill and drain operations and glovebag operations, which included two operational drills and one emergency drill. On Thursday, DOE Environmental Management personnel noted that there was a discrepancy between the actual review team leader and the leader designated in the approved plan of action. The field office and N3B are adjudicating the situation.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 21, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 21, 2022

Plutonium Facility–Glovebox Safety: On Wednesday, a five-member federal Accident Investigation Board commenced its review of the contamination event and potential intake of radioactive material by a worker that occurred on January 7, 2022. Following Triad’s decontamination efforts, board members walked down the laboratory room associated with the incident. They also conducted interviews and received a briefing from Triad’s internal dosimetry team.

Transuranic Waste Facility: On Thursday, Triad declared full implementation of two safety basis changes. One change was related to flammable gas sampling, and the other was the upgrade of the fire suppression system to safety significant. Upgrading the fire suppression system has involved substantial effort since the facility became operational in 2017 (see 9/6/2017 report).

Weapons Engineering Tritium Facility: A Triad team performed an implementation verification review for the safety basis changes supporting upcoming plutonium coupon studies. The team noted four findings in their outbrief and expressed a general concern outside of safety basis implementation with bringing plutonium into the facility given the substantially different radiological hazard compared to tritium.

Radioactive Liquid Waste Treatment Facility–Readiness: Triad’s Joint Evaluation Team met this week to evaluate readiness needs for the resumption of transuranic waste drumming operations. This operation has not been performed since 2014. The hazard category 3 facility is approaching material-at-risk limits which can best be reduced by resuming the drum cementation process. Facility personnel proposed that this was an expansion of existing capability, however the Joint Evaluation Team concluded that it was a restart and should undergo a readiness assessment.

Nuclear Criticality Safety: On Wednesday, the NNSA Field Office concurred with Triad’s revision to the program improvement plan. Focus areas for this fiscal year include: continued development of standardized criticality safety requirements documents; completion of the 86 fissile material operations remaining in the backlog; and full implementation of a new holdup database. On Thursday, Triad requested a variance to the requirement to conduct annual fissionable material operational reviews citing onsite staffing impacts from COVID-19. They specifically requested an extension of the frequency from 12 to 15 months for 79 fissionable material operations with due dates between January 15, 2022 and February 25, 2022.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 28, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending January 28, 2022

DNFSB Staff Activity: J. Flora was on-site to observe activities of the federal Accident Investigation Board. This week, the Accident Investigation Board continued interviews and observed a glove change demonstration in a cold training facility. On Wednesday, the staff held a teleconference with N3B and Environmental Management personnel to discuss the current safety posture of Area G until a modern safety basis is developed and implemented. On Thursday, the staff held a teleconference with NNSA Field Office personnel as part of a complex-wide review of DOE's review and approval of safety basis documents.

Weapons Engineering Tritium Facility: Last Friday, an operator incorrectly implemented a procedure for a gas transfer resulting in the rupture of a safety-significant pressure disk. No tritium was released from the system. Facility management took corrective actions with the operator and more broadly to reinforce proper use of the facility control system. Facility management concluded this event does not meet DOE reporting criteria. In the opinion of the resident inspectors, this event meets reporting criteria for the actuation of a safety-significant component because it resulted from the actual unsafe condition of too much pressure in a segment of the line.

Plutonium Facility–Infrastructure: Last month, Triad issued the tenth revision of the project execution strategy that guides improvement activities necessary to achieve further reductions of the mitigated consequences from postulated accidents to support enduring operations (see 1/15/2021 report). Achievements for last fiscal year include completion of the design for a facility control system replacement, continued progress on fire barriers, and completion of 13 fire hazard evaluations for gloveboxes. Focus areas for this fiscal year include completing modification to fire barriers and structural upgrades necessary to eliminate seismic equipment interactions for the bleed-off ventilation system.

The resident inspectors' review of the document identified that the schedule slipped for several out-year projects including those focused on the ventilation and fire suppression systems. We also noted the approach for achieving a more robust active confinement ventilation system is to replace aging ventilation fans with new equipment that meets performance category 3 seismic criteria, replace the obsolete facility control system, and install a new diesel electric generator and secondary uninterruptible power supply. Of significance, the resident inspectors note that equipping these fans with safety-class electrical power and controls no longer appears to be planned. The need for DOE to provide clarity on the planned end-state of the ventilation system, the schedule for achieving that end-state, and how the system will be credited in the facility safety basis was the subject of the Board's letter dated November 24, 2021.

Area G–Safety Basis: Last Friday, N3B transmitted a revised annual update for the Area G safety basis to the Environmental Management Field Office. The revision is intended to address the field office's condition of approval related to Flanged Tritium Waste Containers (see 12/10/2021 report).

Federal Oversight: On Monday, the NNSA Facility Representative for the Transuranic Waste Facility, RANT Shipping Facility, Radioactive Liquid Waste Treatment Facility, and Waste Characterization, Reduction, and Repackaging Facility completed final qualifications following a walkdown of the Transuranic Waste Facility with the NNSA Field Office Manager.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 4, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 4, 2022

DNFSB Staff Activity: Members of the DNFSB staff held a closeout teleconference with personnel from both field offices and DOE headquarters to discuss the results of the staff's complex-wide review of the process to update and implement DOE directives in contracts.

Plutonium Facility–Glovebox Safety: This week, the Accident Investigation Board covering the January 7, 2022, radioactive material intake event continued interviews with Triad and NNSA Field Office personnel.

On Tuesday, facility personnel conducted fact-findings concerning two recent potential glovebox glove breaches. In one event, a worker was lapping small pieces of plutonium metal and upon exiting the glovebox, identified contamination on his personal protective equipment glove. Glove specialists were unable to identify a breach in the glovebox glove or a potential source of the breach in the operation. In the other event, a worker supporting pyrochemical processing operations similarly detected contamination on his personal protective equipment glove upon exiting the glovebox. Unlike the other event, responding radiological control technicians identified contamination on the worker's face. They were able to successfully decontaminate the worker and there were no indications of an intake. In this case, the work crew and glove specialists identified a likely pinching mechanism associated with manually moving an automatic transfer device that was inoperable. Management took an action to expedite repair of this transfer device. More broadly, workers in both cases indicated compliance weaknesses with the required techniques for exiting gloves. Facility management implemented this technique in August 2020 as a corrective action from the June 2020 glove breach and intake event involving heat-source plutonium. Facility management took an action to include continuing training on the technique, which maximizes confinement in the event of a breach. Also of note, attendees discussed the need to accelerate plans to re-establish capabilities to better examine potentially failed gloves.

Plutonium Facility–Operations: This week, Triad management commenced operations in the facility 24 hours a day, seven days a week. In the near-term, night shift activity will be similar type and tempo as to what was previously performed on the backshift. Longer term, they expect night shift activity to significantly ramp-up in tempo and complexity.

Area G–Safety Basis: Last Friday, N3B submitted for approval a revised Unreviewed Safety Question (USQ) procedure to the Environmental Management Field Office. The field office rejected N3B's previous major revision to the current procedure in 2020 and requested clarification of the procedure's applicability to less than hazard category 3 facilities that may have been miscategorized and the process for requesting extensions. The new procedure provides time limits of three working days from discovering new information to making a determination of a potential inadequacy of the safety analysis and a subsequent limit of five working days to make a USQ determination—a substantial improvement in timeliness requirements from the current procedure.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 11, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 11, 2022

Weapons Engineering Tritium Facility: On Tuesday, the tritium stack monitor alarmed resulting in a facility evacuation in accordance with procedure. At the time, no programmatic activities were in progress and only three individuals were in the facility. Personnel in the area reported to designated shelter-in-place locations and facility command obtained positive accountability. Monitors showed no evidence of an ongoing tritium release either inside or outside of the facility. Further analysis of the stack monitor data concluded the event released a small quantity of tritium (approximately 0.1 curie). Facility personnel are investigating the cause of the release. Facility and emergency management personnel conducted a hotwash to evaluate their response to the event and develop improvements. Key items discussed during the hotwash included: two individuals responded to the event scene before it had been cleared for safety; the need to revisit the appropriate setpoint for facility evacuation due to a stack monitor alarm; and alarm panel communications with the Emergency Operations Support Center.

Transuranic Waste Management: Earlier this month, Triad received approval from the Carlsbad Field Office to resume packaging and shipping transuranic waste originating from gloveboxes with inert or semi-inert atmospheres. The approval is predicated on completing the corrective actions from the titanium event (see 5/14/2021 report), continued use of a compensatory measure to ensure such waste is opened and observed in an air environment, and committing to the near-term completion of a Generator Site Technical Review. Key remaining corrective actions include: developing a plan and schedule to implement chemical compatibility evaluations for evaluation against the safety basis; revising a requirements document to adjust terminology, ensure integration, and incorporate lessons learned; and revise waste management training.

Plutonium Facility–Safety Basis: Last Friday, Triad submitted to the NNSA Field Office for approval a revised version of the combined justification for continued operations/evaluation of the safety of the situation pertaining to the potential inadequacy of the safety analysis resulting from the July 2021 overflow event. The revision is intended to address NNSA’s comments on topics such as clarifying the requirements for the water filling specific administrative control and ensuring that control level designations are consistent with the consequences in the hazard evaluation (see 1/14/2022 report).

Last week, the NNSA Field Office formally transmitted to Triad the review comments on the safety basis addendum supporting receipt of large shipments of heat source plutonium (see 12/24/2021 report). They directed that Triad revise the safety basis addendum to incorporate changes resulting from comment resolution.

Onsite Transportation: Triad submitted to the NNSA Field Office for approval a revision to the technical safety requirements for onsite transportation that incorporates an increase in the limit for heat source plutonium in a package from 10 grams to 25 grams which was previously approved through an evaluation of the safety of the situation and a safety basis addendum.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 18, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 18, 2022

Plutonium Facility–Infrastructure: Heat-source plutonium (HS-Pu) operations are among the highest risk in the facility due to the material’s high radioactivity and dispersible material forms. During the past few years, Triad personnel have made progress analyzing the seismic performance of HS-Pu gloveboxes following the updated seismic hazard from 2007. Their current analyses indicate that only about 10 HS-Pu gloveboxes meet the required seismic performance, meaning that more than 50 gloveboxes are now known to be deficient. The NNSA approved safety basis acknowledges the potential for gloveboxes to be seismically deficient and commits to analyze and upgrade gloveboxes on a risk-based priority. NNSA and Triad are upgrading and replacing about a hundred gloveboxes to support pit manufacturing, analytical capabilities, and surplus plutonium disposition. There are currently no funded plans associated with upgrading or replacing HS-Pu gloveboxes.

Plutonium Facility–Readiness: On Wednesday, Triad managers met to evaluate whether a formal readiness review is necessary for the proposed startup of a new HS-Pu bench-scale recovery line. The new line occupies the gloveboxes associated with the full-scale scrap recovery line that never became operational after challenges completing a readiness review (see 7/8/2005 report). The new line will house a second open vessel and furnace operation, like the existing bench-scale operation, to produce purified HS-Pu oxide through comminution, dissolution, precipitation, and calcination. The new line will also repurpose some of the fixed vessels from the defunct full-scale line to support new capabilities to store and process waste filtrate solutions. Filtrate processing is currently conducted in a different location and is dependent on the use of many plastic carboys to store solutions awaiting processing. Given that these carboys have leaked in the past (see 6/8/2018 report)—moving to the engineered vessels represents an improvement. Triad engineering personnel are currently evaluating whether these gloveboxes meet required seismic performance. Triad managers concluded that this startup will not require a formal readiness review because it meets local criteria for an expansion of an existing capability.

Plutonium Facility–Operations: Facility personnel held a fact-finding meeting to evaluate an event where drums of transuranic waste were staged too close to inactive areas containing holdup of special nuclear material contrary to the criticality safety posting for drums. Last fall, following the start of holdup measurements in this area to support future equipment removal, facility personnel identified that their current processes have weaknesses for tracking material at risk in inactive areas. Until a process is put in place, compliance with criticality safety limits and material at risk limits will continue to be a challenge for facility workers.

Radiological Laboratory Utility Office Building (RLUOB)/PF-400: A contractor team completed an operational readiness review for the upgrade of RLUOB to a hazard category 3 nuclear facility to be known as PF-400. They identified four prestart and three post-start findings during their review. A federal operational readiness review is planned for May following completion of corrective actions from this review.

Area G–Readiness: N3B and Environmental Management Field Office personnel held an event investigation meeting to evaluate the commencement of the contractor readiness assessment for resumption of drill and drain and glovebag operations in the Dome 231 Permacon with an inaccurate approved Plan of Action (see 1/14/2022 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 25, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending February 25, 2022

Chemistry and Metallurgy Research Building: Subcontractor personnel recently commenced more invasive decontamination and decommissioning activities such as glovebox removal. Last week, during removal of the first glovebox, a continuous air monitor alarmed. The work crew, who were wearing respiratory protection, evacuated the room. Responding radiological control technicians found contamination on the personal protective equipment of several individuals. They found no skin contamination, no evidence of any uptakes, but areas of substantial contamination in the room and adjacent areas. The air monitor alarmed shortly after subcontractor personnel removed and replaced a plug from the glovebox to drain possible oil holdup. At the fact-finding, personnel discussed several areas in need of improvements. Most prominently, the group discussed the need to ensure ventilation systems are configured optimally for the work. In this case, subcontractor personnel had placed plastic sheeting around the room that may have obstructed ventilation exhaust intakes. Additionally, ventilation draw on the glovebox being removed may not have been maximized. A second prominent topic of discussion involved improved planning and controls for breaching contaminated systems. In this case, subcontractor personnel breached the glovebox confinement without the aid of a glovebag, local task exhaust, or continuous monitoring by a radiological control technician. Other areas discussed included improving housekeeping and ensuring correct anti-contamination clothing for potential hazards such as contaminated oil.

Sigma Facility: On Wednesday evening, facility personnel noticed smoke and evacuated the building after pulling the fire alarm. The two people present evacuated without issues. The Los Alamos County Fire Department responded and extinguished a smoking piece of equipment in a radiological area with one fire extinguisher followed by water for cooling. No contamination was released by the fire. Researchers reported finishing an experiment with the piece of equipment about an hour before the event without any apparent issues. The fire department is investigating the cause of the incident.

Federal Oversight: On Wednesday, a six-person team led by an individual from the NNSA Production Office commenced an assessment of conduct of operations in the Plutonium Facility. The primary purpose of the assessment is to evaluate the effectiveness of Triad's corrective actions from several negative events that occurred last year (see 4/2/2021 and 7/23/2021 reports), as well as overall compliance with requirements for conduct of operations. NNSA is also using this assessment as part of a broader effort to ensure enhanced and sustainable formality of operations at all its sites after a recent review indicated that there has not been a measurable reduction in events during the past 10 years despite numerous corrective actions. The team is expected to complete their onsite observations by March 18, 2022.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 4, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plae, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 4, 2022

DNFSB Staff Activity: A. Hutain was onsite to observe activities by the NNSA team reviewing conduct of operations at the Plutonium Facility.

Weapons Engineering Tritium Facility: On Tuesday, facility management was notified that an operator made various unapproved deviations from a use every time procedure while loading a Hydride Transport Vessel. The operator could not follow the approved procedure as written because of the configuration of the system following last month's actuation of a safety significant rupture disk (see 1/28/2022 report) and believed he had verbal permission to make the changes. Facility management confirmed the safety of the tritium gas handling system and the loaded vessel. Given this was the second conduct of operations even in about six weeks, they also plan several other corrective actions including conducting a causal analysis and holding a conduct of operations refresher session.

Engineering: Last week, Triad submitted to the NNSA Field Office for awareness its plan to update the site's probabilistic seismic hazards assessment (PSHA). DOE Order 420.1C, *Facility Safety*, requires contractors to review natural phenomena hazards (NPH) at least every 10 years. In 2014, the previous LANL contractor completed a review of NPH and set a milestone to complete a revision of the PSHA by September 1, 2019. The current PSHA for the LANL site was completed in 2009. Since then, LANL contractors have completed a number of studies to reduce uncertainties in the seismic model, most notably they have obtained additional valuable geotechnical data associated with the LANL site. As a result, Triad concluded a PSHA update is necessary and noted that their current schedule calls for completion by the end of fiscal year 2025.

Plutonium Facility–Glovebox Safety: Last Thursday, while an operator was lifting a vessel out of a furnace well, the lifting tool disengaged from the vessel and impacted the inside of the glovebox window causing a crack. Operators responded to the event as if it was a glovebreach as there is no specific training for responding to a cracked window. There was no evidence of any contamination spread from the cracked window and engineers consider the glovebox fully operable. The window is currently taped up awaiting replacement. One planned corrective action is to develop and train to a response procedure for cracked windows. This and several similar activities involve challenging ergonomics of hand lifting a heavy vessel in glovebox gloves. Attempts to introduce mechanical lifting aids for similar activities have not been met with success.

Area G–Readiness: A nine-member federal team commenced a readiness assessment for resumption of drill and drain and glovebag operations in the Dome 231 Permacon.

PF-400–Readiness: The contractor's operational readiness review team issued their final report for the upgrade of the Radiological Laboratory Utility Office Building to a hazard category 3 nuclear facility to be known as PF-400. The four prestart findings include the need to identify the full scope of needed maintenance activities and the need to include the full set of necessary activities in the startup plan. The three post-start findings include an unprotected material-at-risk assumption in the safety basis and the need to fully implement vital safety system and system health reporting processes.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 11, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 11, 2022

DNFSB Staff Activity: On Tuesday, staff members conducted a teleconference with personnel from the Idaho National Laboratory, the DOE Idaho Operations Office, the NNSA Headquarters, and the NNSA Los Alamos Field Office. They discussed contingencies associated with the campaign to ship heat-source plutonium to the Plutonium Facility in quantities that exceed the current safety basis limits (see 11/26/2021 report). Of note, DOE/NNSA stated that they have no contingencies should the plan to ship this material to LANL be foreclosed for any reason.

Plutonium Facility–Operations: Last Wednesday, after a question from a resident inspector, operations personnel assessed waste drums staged near a pencil tank and declared a potential process deviation. At a fact-finding held on Tuesday, facility personnel confirmed that three drums violated a criticality safety requirement because they were too close to pencil tanks that have recently been determined to contain fissionable material. This is the third time this issue has recently occurred in this room (see 2/18/2022 report). Fact-finding participants confirmed previous concerns about posting inactive equipment locations that have been determined to contain holdup. After a revitalization of the holdup measurement program, there are currently about 30 of these locations across the facility. Participants also discussed broader concerns with the imprecision in the language of a criticality safety limit that specifies a standoff from “any other fissionable materials,” since this could be interpreted to include minor contamination.

Plutonium Facility–Glovebox Safety: On Wednesday, facility personnel conducted two fact-findings for recent glovebox glove breaches. In the first event, after moving tools a worker observed a breach while inspecting gloves prior to removing their arms. This is the best time to catch a breach and the subsequent response worked as intended without any release of radioactive contamination to the room. In the second event, a worker felt a pinch while releasing a tool from a holding bar, did not observe a glove breach upon inspection, but identified contamination on their inner gloves while surveying immediately upon removing their arms. This is the second-best time to catch a breach and contamination spread was also avoided. Glovebox safety personnel recommended that both activities use protective overgloves in the future. For the second event, they also recommended that line management select a more frequent glovebox glove change periodicity as the glove was on year 7 of the 10-year default service life.

Last year, glovebox safety personnel identified 19 glove failures or breaches in the facility. While this represents an improvement from about 2.5 glove failures per month experienced in earlier years, glovebox safety personnel recognize that improvements are still needed, particularly as the amount of work in the facility increases. They have started several initiatives including developing improved metrics, deploying an in-service leak testing device for glovebox gloves, refining procedures and training related to gloves, and applying additional scrutiny of selection of glove change frequencies.

Plutonium Facility–Safety Basis: On Tuesday, the NNSA Field Office approved a revised version of the combined justification for continued operations/evaluation of the safety of the situation pertaining to the July 2021 overflow event (see 2/11/2022 report). The field office directed two changes in the wording of Specific Administrative Controls.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 18, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 18, 2022

DNFSB Staff Activity: Staff members M. Dunlevy and P. Migliorini were on site for a review of the current safety posture of Area G under multiple Justifications for Continued Operations developed to address the 23 potential inadequacies of the safety analysis (PISA) identified against the Area G safety basis in 2020 and early 2021. M. Sautman was on site for familiarization and to evaluate resident inspector performance. M. Randby was on site for familiarization.

Area G–Safety Basis: Last week, N3B personnel declared a PISA against the Area G safety basis following questions raised by the federal team assessing readiness of drill and drain and glovebag operations. The PISA concluded that a safety basis reference did not support a conclusion regarding hydrogen accumulation in closed plastic containers with lids. This PISA further determined that the technical basis was incorrect for two exemptions from a technical safety requirement specific administrative control for Sort, Segregate, Size Reduction, and Repackaging activities. N3B is generating a shift order to communicate any compensatory measures and has determined that this is an unreviewed safety question.

Plutonium Facility–Infrastructure: On Tuesday, the NNSA Administrator responded to the reporting requirement from the Board’s letter dated November 24, 2021. The Board requested a written report that describes DOE’s strategy for the Plutonium Facility confinement ventilation system, the planned end-state of the ventilation system, the schedule for achieving that end-state, and how the system will be credited in the facility safety basis. NNSA’s response states that it will pursue upgrades to achieve a more robust ventilation system but will not achieve a safety class active confinement ventilation system at the Plutonium Facility. This path forward represents a change in strategy from what NNSA personnel briefed the Board in February 2020, where they described the future control strategy as including safety class active confinement ventilation.

Plutonium Facility–Materials Processing: There were two events last week involving processing of materials stored at the Plutonium Facility. In the first event, a portable continuous air monitor alarmed during introduction of a legacy item into a glovebox line through an open front hood for eventual disposal as waste. Responding radiological control technicians found no contamination on the workers or evidence of any uptake. They discovered contamination on the floor in front of the hood which has been cleaned. Facility personnel are evaluating other containers in this feed stream to determine if additional planning is needed to prevent issues during future processing of similar containers.

The other event involved materials to be processed to plutonium oxide in a muffle furnace. Upon opening the can workers discovered an oily sludge of questionable provenance. The work crew paused and reported the event. During the response, the workers placed the solid items into a water-resistant container per direction from criticality safety personnel. Further recovery actions are in progress for the container with sludge residue.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 25, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending March 25, 2022

DNFSB Staff Activity: Staff members F. Bamdad, P. Migliorini, and R. Oberreuter were onsite for a review of the safety basis addendum supporting the upcoming receipt of large shipments of heat source plutonium. They also held a meeting to discuss the technical basis behind a fire protection equivalency at the Radiological Laboratory Utility Office Building. Another staff team held a virtual meeting with site personnel to discuss decontamination and decommissioning activities at the Plutonium Facility and the Chemistry and Metallurgy Research building to support an upcoming staff review.

Transuranic Waste Management: Last Friday, personnel at the Waste Isolation Pilot Plant (WIPP) identified that a transuranic waste drum from Los Alamos had been emplaced in the repository without having received a flammable gas analysis. WIPP certification personnel at Los Alamos are required to perform this analysis to comply with shipping requirements. WIPP management paused receipts of drums from Los Alamos while they evaluate the event. Locally, Triad personnel have entered their new information process to evaluate the safety basis implications of having a drum without flammable gas analysis in the RANT Shipping Facility, the Transuranic Waste Facility, and the Transportation Safety Document.

Plutonium Facility–Nuclear Criticality Safety: This week, personnel in the pyrochemistry room implemented a pilot for a new glovebox combustible loading program. The new program limits the amount of fixed and transient combustibles within a glovebox to an amount that would limit a fire to less than 100 kilowatts. Triad analysts determined that a fire within a glovebox of less than 100 kilowatts would be of insufficient energy to activate nearby over-head fire sprinkler heads. This allows criticality analysts to limit the amount of flooding they must analyze when this combustible limit is implemented in a seismically qualified glovebox without any other viable sources of liquid-ingress. In order to implement this new control, operations personnel have developed operator aids posted at the glovebox location. The aids include photographs of the inside of the glovebox with the baseline level of allowed combustibles. During their morning inspections to release work, area controllers compare the as-found condition against the baseline. If conditions exceed the baseline, they declare a potential process deviation and work cannot be performed.

The pilot includes two gloveboxes and facility personnel will evaluate this approach in about a month. If found to be workable and effective, the resident inspectors note that a similar approach could be applied to control housekeeping and combustible loading issues in other gloveboxes such as those with increased hazards like heat-source plutonium. While improvements have been made in the past year, maintaining good glovebox housekeeping continues to need management attention. Notably, the combined waste accumulation in all approved staging locations often challenges the limit of 55 gallons for a single room.

Onsite Transportation: The NNSA Field Office unconditionally approved the revision to the technical safety requirements for onsite transportation allowing an increase in the amount of heat source plutonium in packages (see 2/11/2022 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 1, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 1, 2022

Plutonium Facility–Infrastructure: On Tuesday evening, facility personnel shut down the ventilation system for the north half of the facility because of malfunctioning damper actuators. As a result, all normal mission activities in the north half were terminated. Maintenance personnel were able to restore the system by Thursday evening. Repair efforts were hindered by insufficient spare parts. The affected portion of the facility also experienced several continuous air monitor alarms during the ventilation outage. On Thursday, facility personnel declared the instrument air system, which supports the ventilation system, degraded but operable following issues with an air dryer.

In a letter to the Board dated March 15, 2022, the NNSA Administrator stated that they are no longer pursuing a safety class active confinement system (see 3/18/2022 report). The resident inspectors note that both the actuators and the instrument air system that failed would have required upgrades to support the previous documented plans to achieve a safety class system. NNSA’s letter now lists these upgrades as open, meaning that no plans exist for upgrades.

Plutonium Facility–Safety Basis: On Monday, NNSA Headquarters conditionally approved the safety basis addendum associated with the receipt of large quantities of heat source plutonium (see 11/26/2021 report). The conditions of approval, required by April 29, 2022, involve addressing outstanding comments on the addendum and wording changes to a technical safety requirement. In approving this addendum, NNSA Headquarters accepted an “exigent condition” where there is no viable control strategy to meet DOE’s evaluation guideline for postulated consequences to the public. In this case, NNSA accepted bounding mitigated consequences to the public that range from 490 to 3,175 rem depending on the amount of radioactive material assumed to leak out of the building structure following a post-seismic fire. NNSA deemed the risk acceptable based on the conservatism in the analysis, the low likelihood that the accident occurs, and the limited number of shipments. The primary controls credited to protect the public are the shipping containers (which must be received by May 2024 before certifications expire) and the seismic power shutoff system (which has an acknowledged deficiency and cannot prevent all fire ignition sources following an earthquake). Work associated for this activity will be primarily performed in four gloveboxes where only one of the gloveboxes meets minimum seismic requirements.

Transuranic Waste Management: On Wednesday, Triad sent the NNSA Field Office a progress report on actions associated with an inadequacy with the safety analyses they declared in December 2020 for three nuclear facilities following issuance of DNFSB-TECH-46, *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at Los Alamos National Laboratory*. The report notes that they plan to resubmit an evaluation of the safety of the situation by the end of July 2022—about a year after N3B received approval on its evaluation for Area G (see 7/23/2021 report). The report also notes that an extent-of-condition review to complete chemical compatibility analyses for activities in the Plutonium Facility should be completed by the end of fiscal year 2022. The report justifies the schedule delays due to ongoing research effort to study the reactivity of anion exchange resins. Meanwhile, the resident inspectors note that NNSA has yet to develop a defensible general solution for determining a *de minimis* amount of incompatible chemical mixtures.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 8, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 8, 2022

Radiation Protection: On Tuesday, Triad personnel briefed the NNSA Field Office leadership on efforts to manage worker radiation doses. The most recent DOE annual radiation exposure report shows Los Alamos leads all sites with the highest collective worker dose and an upward trend, consistent with an expanding mission. Triad explained that most of this dose comes from workers in the Plutonium Facility, particularly the groups that work with heat-source plutonium, support legacy material repackaging, manufacture new pits, conduct surveillance work on old pits, and support construction and maintenance. They further explained their dose management processes and various action levels. Triad sets their administrative control level at 2,000 mrem and their action level to perform a management review at 1,000 mrem. These values are considerably higher than other sites. For example, the Savannah River Site and the Lawrence Livermore National Laboratory both perform plutonium work and use 500 mrem as their administrative control level. Triad justified these higher levels based on historical information for the type of work performed in the Plutonium Facility. They further asserted that their As Low As Reasonably Achievable program was effective and compliant. Notably, Triad discussed additional reviews of established operations, since most dose review processes focus on operations that are new or modified.

Plutonium Facility– Infrastructure: Last Friday, the NNSA Field Office approved the third revision of the safety design strategy for the Los Alamos Plutonium Pit Production Project. This revision separates out activities into those needed to achieve a base capability to produce 30 pits per year and those needed to achieve that rate reliably. It also increases the material-at-risk for the solvent extraction process. The approved safety design strategy continues to indicate planned upgrades to achieve a safety class active confinement ventilation system contrary to NNSA’s recent response to the Board (see 4/1/2022 report).

On Monday, Triad personnel conducted a fact-finding on last week’s ventilation system failure. Due to obsolescence, there are no working spare actuators on hand. Of the two damper actuators that failed, facility personnel restored one through manual stroking and replaced the other through cannibalization of damaged spares and inactive actuators installed in the facility. System engineering personnel believe they can maintain functionality of the damper actuators through continued scavenging of unused or damaged components until replacements are installed. A new model of actuator will be installed as soon as possible and was already undergoing testing and commercial grade dedication at the time of the failures.

Area G: Last Wednesday, N3B management declared a nuclear criticality safety infraction after personnel conducting an annual review determined a waste container was non-compliant with spacing requirements. Their criticality analysts determined the configuration was safe and would be allowed under an approved evaluation that is not yet implemented. Because containers involved have uncertain potential for an energetic chemical reaction, N3B management conservatively decided to leave the configuration in-place and accelerate implementation of the new evaluation. N3B management also requested additional review to determine why the existing limit did not get incorporated into the applicable procedure and posting.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 15, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 15, 2022

DNFSB Staff Activity: Members of the DNFSB staff held a closeout teleconference with personnel from the Environmental Management Field Office and N3B to discuss the results of the staff's review of the current safety posture of Area G (see 3/18/2022 report).

Plutonium Facility–Infrastructure: Last month, facility engineers determined that the gloveboxes for the new heat-source plutonium recovery line meet seismic performance requirements after revising their calculation to account for the installed anchors (see report dated 2/18/2022). This glovebox line is essential to increasing the throughput necessary to support the eventual processing of the shipments of large quantities of heat-source plutonium expected to meet launch requirements for the National Aeronautics and Space Administration (see report dated 4/1/2022). Workers continue to finalize modifications to the glovebox line. The new line will rely on a portable vacuum pump because of long-term availability and reliability issues with the house wet vacuum system that supports this area of the facility. NNSA does not have a schedule or funding to refurbish that system. Notably, the portable vacuum pumps typically provide a service life of about six months and then become a challenge to remove from the glovebox environment and dispose as transuranic waste.

Plutonium Facility–Worker Safety: Last Thursday, a worker felt a poke on a finger while performing decontamination activities in one of the material management rooms. Radiological control technicians responded and found no detectable contamination on the finger to include a subsequent wound count. The worker indicated that he identified a strand of wire embedded in the floor paint that may have been the source of the puncture. At the fact-finding on Tuesday, facility personnel discussed improvements for decontamination activities including the use of more puncture resistant gloves. They also discussed potential origins of the wire strand. Tamper indicating devices and radiological condition tags both use braided wire and are ubiquitous in the facility. In particular, workers routinely cut the tamper devices inside and outside of gloveboxes, which are known to unravel and generate sharp strands. In response, management directed a learning team to identify any near-term improvements to working with the tamper devices and longer-term efforts to investigate whether the braided wire could be substituted with a safer material.

Transuranic Waste Management: Last month, the NNSA Field Office directed Triad to develop a plan and schedule to establish size reduction capabilities for oversized transuranic waste using the Waste Characterization, Reduction, and Repackaging Facility (WCRRF) as a hazard category 3 nuclear facility. Triad does not possess this capability, which is needed to support removal of more than 150 legacy gloveboxes and some pieces of large, contaminated equipment from the Plutonium Facility as part of upgrades for pit manufacturing. NNSA previously planned to establish modern and enduring capabilities for size reduction and container remediation as part of the original mission the Transuranic Waste Facility, but they eliminated the scope as a cost saving measure. The 1980's vintage WCRRF will require a new safety basis, substantial corrective maintenance, and readiness reviews before operations can begin. The NNSA Field Office also directed Triad to evaluate establishing capabilities for other size reduction processes inside the yard at the Plutonium Facility and for shipping larger-size waste boxes.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 22, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 22, 2022

DNFSB Activity: On Wednesday, the Board members received a briefing from Triad and NNSA Field Office personnel on their actions to improve the safety of transuranic waste operations. This updated DOE's response dated March 30, 2021, to DNFSB-TECH-46, *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at Los Alamos National Laboratory*, with information regarding corrective actions from the titanium sparking event and other current initiatives for chemical compatibility evaluations for transuranic waste.

On Tuesday, members of the Board's staff conducted a closeout teleconference with NNSA Field Office and Triad personnel to discuss the results of the staff's review of the receipt and repackaging of large amounts of heat source plutonium at the Plutonium Facility (see 3/25/2022 report).

Plutonium Facility–Accident Investigation: On Tuesday, the Federal Accident Investigation Board briefed the NNSA Field Office on the results of its investigation into the contamination spread and potential uptake of radioactive material by a worker in January (see 1/21/2022 report). The final investigation report will be issued following a briefing to the NNSA Administrator.

Plutonium Facility–Conduct of Operations: A worker manipulated a valve and inadvertently drained the negative pressure chilled water system. This was in the same room where the wet vacuum system overflowed from a valving error last year and the performance errors were similar (see 7/23/2021 report). Facility management has directed that work activities in the pump room will be overseen by a senior supervisory watch as a corrective action. The chilled water system cannot be refilled and used until the justification for continued operations related to last year's overflow event is implemented, which is expected next week (see 3/11/2022 report).

Readiness: Triad and N3B are entering a period of increased readiness activities, including:

- A federal operational readiness review for the startup of PF-400, planned to commence in May. This is the upgrade of the Radiological Laboratory Utility Office Building to a hazard category 3 nuclear facility.
- A federal readiness review to support startup of plutonium coupon experiments in the Weapons Engineering Tritium Facility, planned for the summer.
- A federal readiness review to support restart of aqueous nitrate operations in the Plutonium Facility, planned for the fall.
- A contractor readiness assessment for corrugated metal pipe retrieval and federal readiness assessments for size reduction of the corrugated metal pipes and venting of the Flanged Tritium Waste Containers at Area G, all planned for the summer.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 29, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending April 29, 2022

Wildland Fire: Last Friday, during an epic high wind event, a fire of unknown origin started west of the laboratory in the Jemez Mountains. The fire, designated the Cerro Pelado Fire, has since grown to more than 7,000 acres and is approximately 10 miles from the laboratory. Much of the land between the active fire and the lab is filled with burn scars from the 2011 Las Conchas fire. Triad Emergency Management personnel are monitoring the situation and plan to activate the Emergency Operations Center if conditions deteriorate indicating a threat to laboratory property. Currently, the main impact to laboratory operations is degraded air quality.

Plutonium Facility–Infrastructure: On Thursday, Triad personnel successfully removed an unused glovebox from a laboratory room in the Plutonium Facility. The box had never been used, and all radiological swipes were clean. It was removed without incident. The box is currently staged in the basement awaiting clearance to be removed from the facility. Once removed, it will be repurposed for training personnel in deactivation and decommissioning activities.

Emergency Management: Last week, during a planned chemical cleanup activity at the Technical Area 48 Radiochemistry Facility, workers identified an unsealed bottle of uninhibited tetrahydrofuran, a peroxide-forming chemical. Workers did not observe any visible crystal formation; however, they tested the bottle with test strips and determined it contained peroxides. They segregated the bottle in the corner of fume hood behind a blast shield and informed the hazardous materials team. The team responded and performed a controlled destruction of the reagent bottle in a containment vessel without incident.

Federal Oversight: Recently, the NNSA Field Office leadership has made a concerted effort to increase oversight staffing to support pit production and other priority mission increases at the laboratory. They recently hired individuals to fill roles as facility representatives, nuclear safety specialists, and maintenance managers. They are working to get these new staff fully qualified for their roles. In the past two weeks, three individuals completed final oral boards: one facility representative for the Los Alamos Neutron Science Center, one facility representative for the Science and Technology Operations facilities, and one maintenance manager who will focus on nuclear facilities other than the Plutonium Facility.

The Environmental Management Field Office leadership is also working to increase staffing and recently hired a nuclear safety specialist. Their direct field oversight, which has four authorized positions for facility representatives, is currently staffed at one fully qualified facility representative and one facility representative in training. Two technical assist contractors provide support to the federal personnel.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 6, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 6, 2022

Plutonium Facility–Infrastructure: Last week, an NNSA team conducted a technical independent project review of the Los Alamos Plutonium Pit Production Project (LAP4). At the exit brief, the review team provided an overall conclusion that nuclear safety is being successfully integrated into the design, and qualified personnel are engaged in the project. They provided 9 recommendations, which are concerns that, in the team’s opinion, need to be addressed. Of particular note, the team recommended that LANL demonstrate that the confinement approach results in a “very high assurance” of the confinement of radioactive material and consistency with facility safety basis documents by December 2, 2022.

On Friday, Triad transmitted to the NNSA Field Office for approval an update to the safety design strategy for LAP4. This update reflects the elimination of the goal to achieve a safety class active confinement system for the facility (see 4/1/2022 report). The strategy discusses meeting confinement requirements through the safety significant ventilation system and the safety class passive confinement identified in the safety basis. The strategy asserts that the leak path factor calculations supporting the passive confinement approach have withstood “a tremendous number of technical evaluations...” Contrary to this assertion, the Board provided extensive critique of the leak path factor calculations in November 2019 via Tech Report 44, *Los Alamos National Laboratory Plutonium Facility Leak Path Factor Methodology*. In response, NNSA and Triad committed to develop a new calculation; however, Triad has experienced delays developing the new calculation and the schedule for completion is uncertain.

Transuranic Waste Management: On Wednesday, the NNSA Field Office noted its concurrence with Triad’s proposed impacts for implementing DOE Standard 5506-2021, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities*, for the safety bases for the Transuranic Waste Facility and the RANT Shipping Facility. Triad concluded that some types of additional safety controls would have lesser programmatic impacts, but there would be costs associated with development and implementation of new controls. They noted completion of the analysis would allow for a better understanding of the programmatic impacts.

Wildland Fire: The Cerro Pelado Fire continues burning in land west of the laboratory and has impacted more than 32,000 acres. Much of the fire is currently active in the blackened region from the 2011 Las Conchas Fire. On Monday, the LANL Emergency Operations Center entered monitoring mode as the fire moved closer to the site boundary. Triad Emergency Management personnel and the NNSA Field Office have established criteria for moving the laboratory to a maximum telework status and for suspending onsite operations. The fire is currently approximately 5 miles from the site boundary. Fire crews have been performing tactical backburn operations to limit fire spread toward the laboratory. Additionally, Triad personnel have aggressively pursued fuel mitigation efforts near the Weapons Engineering Tritium Facility, which is the closest nuclear facility to the fire. N3B requested Triad perform additional mitigation on the south side of Technical Area 54 to increase defensible space around the storage of transuranic waste drums in the domes at Area G.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 13, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf, D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 13, 2022

DNFSB Staff Activity: A. Boussouf commenced duties as the third resident inspector assigned to LANL

Wildland Fire: The Cerro Pelado wildfire remains active west of the laboratory and grew to more than 45,000 acres. Spread in the direction of the laboratory has been relatively slow over the past week. Last weekend, the fire crossed the decision point for the laboratory to move to a maximum telework posture, which became effective Monday morning. The Emergency Operations Center also moved from monitoring mode to a partial activation.

Radiological Laboratory Utility Office Building (RLUOB)/PF-400: A federal team completed an operational readiness review for the upgrade of RLUOB to a hazard category 3 nuclear facility. On Wednesday, they briefed NA-LA Field Office and Triad personnel on the initial findings. They presented eight findings for Triad and two for the Field Office. Notable findings for Triad include: the issues management system does not effectively resolve moderate and high significance issues, the fire protection program has not been effectively implemented to address some elements for a hazard category 3 facility, and the maintenance program does not currently meet the requirements for a hazard category 3 facility. The findings for the field office were that they do not have a baseline oversight plan for the facility and that they do not have sufficient qualified oversight staff to support the transition to hazard category 3 operations.

Plutonium Facility–Infrastructure: Last weekend, the NNSA Field Office conditionally approved a longstanding LANL contractor exemption request from 2015 regarding areas underneath gloveboxes that cannot receive coverage from the automatic fire suppression sprinklers mounted on the ceiling contrary to standards required by DOE Order 420.1C, *Facility Safety*. LANL proposed placing fencing around new or modified gloveboxes to eliminate the common practice of placing combustibles under the gloveboxes. We note that this fencing is highly effective, but Triad has no plans to expand installation to the large number of existing gloveboxes. To compensate, one of NNSA's conditions of approval included improving a number of elements of the transient combustible loading program, including developing a process to evaluate combustibles underneath gloveboxes.

On Tuesday, Triad personnel briefed NNSA headquarters on the Plutonium Facility Seismic Performance Reassessment Project (see 12/17/2021 report). NNSA accepted Triad's proposed alternative to fully document and peer review the interim risk results while placing the full seismic performance reassessment on hold until the updated probabilistic seismic hazards assessment is completed, which is currently anticipated in 2025. The interim risk results currently show performance for all limit states governed by horizontal motions are well below the target performance goals. Mean performance for limit states driven by vertical ground motion are below the target performance goals. However, in some conservative sensitivity studies, limit states driven by vertical ground motion approach and exceed the target performance goals.

Transuranic Waste Management: Last Friday, the NNSA Field Office directed Triad to develop a safety design strategy and address elements of DOE-STD-1189-2016, *Integration of Safety into the Design Process*, for its plan to develop a new safety basis supporting size reduction and limited waste container remediation activities at the Waste Characterization, Reduction, and Repackaging Facility operated as a hazard category 3 nuclear facility (see 4/15/2022 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 20, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf, D. Gutowski and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 20, 2022

Wildland Fire: The Cerro Pelado wildfire west of the laboratory did not grow significantly last week and is now more than 70 % contained. On Tuesday, given the decreased threat to laboratory property, Triad downgraded staffing levels for the Emergency Operations Center and laboratory personnel returned from maximum telework status. Given the dry conditions of fuels in the area, wildland fire experts remain concerned about a new fire start and have placed additional fire restrictions on laboratory property and the surrounding area.

Weapons Engineering Tritium Facility: Last week during the monthly surveillance for the safety-significant Oxygen Monitoring System, facility personnel identified problems with monitors in two gloveboxes and determined they were inoperable. Further evaluation found a white deposit on these detectors, and an extent of condition on other detectors in the plant found no other white deposits. Facility personnel cleaned the white deposit and reperformed the surveillance, which restored the function of the detectors. The system has been restored to service, and the facility's investigation continues including communications with the detector manufacturer.

Plutonium Facility–Infrastructure: Last week on the backshift, workers decontaminating a glovebox slated for removal identified contamination on their personal protective equipment indicative of a glove breach. There were no issues with the workers' response to the event, and no evidence of skin contamination or any airborne radioactive material. The work crew was conducting a first use of a new decontamination solution, which is expected to be used in many other boxes. Deactivation and decommissioning activities continue to ramp up at the Plutonium Facility. Following this event, facility management is recommending evaluating changing glovebox gloves to 20 mil thickness prior to in-box decontamination activities to provide an optimal balance of durability and dexterity. The gloves involved in the event were 15 mil thickness and had been in contact with equipment inside the glovebox.

Plutonium Facility–Readiness: Earlier this month, facility management determined that no readiness activities, including a management self-assessment or subject matter expert checklist reviews, are necessary for the upcoming campaign to process large quantities of heat-source plutonium. The screening worksheet acknowledges the activity will involve larger quantities of radioactive material but notes that this change has been approved in the safety basis with procedural controls. Given the overall determination, Triad's joint readiness evaluation team will not be considering this activity. The NNSA Field Office is reviewing the matter.

Area G–Readiness: A contractor team commenced the readiness assessment for retrieval of Corrugated Metal Pipes (CMP) in Area G. Size reduction and packaging of the CMPs into standard waste boxes for disposal as transuranic waste is not part of the scope of this review and will be assessed at a later date. This week, the team performed interviews, observed an emergency preparedness drill, and watched a field demonstration for uncovering the CMPs with an excavator which included an operational drill. The review will continue next week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 27, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf, D. Gutowski, and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending May 27, 2022

DNFSB Staff Activity: On Wednesday, the Board's staff held a call with DOE and N3B personnel to discuss the proposed atmospheric dispersion protocol that will support the new DOE Standard 3009-2014 compliant documented safety analysis under development for Area G.

Weapons Engineering Tritium Facility: Last Wednesday, there was a procedure execution error during a first time use validation using helium as a surrogate gas for tritium. A worker inadvertently opened a cap in the tritium gas handling system instead of opening a valve. The individual noticed the error immediately and tightened the cap, but helium was released into a glovebox. Tritium levels in the box increased but remained below alarm setpoints. This is the third procedure error at the facility since the beginning of the year (see 1/28/2022, 3/4/2022 reports). Facility management suspended gas transfers and is performing an extent of condition on the tritium gas handling system to look for other caps that could be inadvertently loosened. The tritium gas handling system will remain out of service until it is leak tested.

Radiological Laboratory Utility Office Building/PF-400: The resident inspectors walked down portions of the facility with Triad engineering personnel to further discuss the modeling assumptions used in the calculation justifying the equivalency to remove the HEPA filter deluge system (see 11/5/2021, 3/5/2022 reports).

Plutonium Facility–Emergency Management: Last Wednesday, there was an emergency medical response to the Plutonium Facility due to a head injury in the basement. Facility personnel later held a fact-finding meeting to discuss the incident and the response. One key item that emerged was that this was the first medical response to the facility following the disbanding of the Medical Response Team (MRT). The MRT was a volunteer group of personnel who maintained a level of first responder training to promptly respond to injuries in the protected area. They usually moved patients out of the facility to meet the fire department outside of some security or radiological boundaries to improve response time. Training and communications of this change is incomplete, which led to some communications errors during this response. Also, the Building Emergency Plan update reflecting this change is still in approval.

On Thursday, Triad personnel conducted a tabletop drill to train on emergency response actions associated with a criticality accident at the Plutonium Facility. In the scenario, four individuals were adjacent to the accident and needed emergency medical attention. One key item discussed at length during the tabletop was the medical response including integrating medical needs with security and radiological requirements, and the capabilities of the local hospital to deal with four potentially contaminated patients at once.

Area G–Readiness: A contractor team finished its readiness assessment for retrieval of the Corrugated Metal Pipes (CMP) and briefed DOE and N3B on their initial findings. The team had three pre-start findings and six post-start findings. Key findings included: procedure compliance is not at the expected level of performance; the five CMPs with higher dose rates were not addressed as part of reviews to minimize dose; and the event investigation meetings held to evaluate two events during demonstrations did not include all the actions described in the company policy for learning from events.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 3, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf, D. Gutowski, and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 3, 2022

Plutonium Facility–Accident Investigation: On Tuesday, the NNSA Cognizant Secretarial Officer for Safety signed out the report from the accident investigation associated with the January 7, 2022, radioactive material release and uptake event (see 4/22/2022 report). The report notes that subsequent bioassay monitoring of the exposed individuals revealed radiation doses that did not exceed the criteria for a formal Accident Investigation Board; however, NNSA personnel continued to review the event to obtain lessons learned and document them in an Incident Review Report. The report identified the overall direct cause as an incorrectly configured ventilation lineup that isolated the glovebox from ventilation and allowed radioactive material to leak from a degraded gasket on an unused sample port. The report provides 27 conclusions resulting in 9 judgements of need. Some of the weaknesses identified include: insufficient configuration management of gloveboxes; lack of protocols to ensure procedures reflect actual equipment configurations; overreliance on the skill of the worker; confusion on roles and responsibilities with respect to glovebox ownership; and inadequate control of hazards from glovebox appurtenances.

On the last point, the report notes that there is no systematic process in place to monitor appurtenances, many of which use gaskets that degrade and are often run to failure. These appurtenances constitute part of the physical confinement boundary provided by the glovebox safety system. Gloveboxes are required to maintain confinement even under loss of ventilation. In this event, the glovebox failed to perform its safety function. The resident inspectors note that since 2011, facility personnel have been monitoring and planning to address about 40 appurtenances with questionable seals, including 4 of the same design that failed in this event. Facility personnel are also monitoring flexible boots on another 8 gloveboxes, including one that recently developed a hole. In our opinion, the tendency to consider these safety significant confinement boundaries as operable despite components with questionable integrity creates a mindset that impedes timely permanent fixes.

Transuranic Waste Management: On Thursday, the NNSA Field Office noted its concurrence with Triad's impact assessment and proposed plan for updating the safety basis for the Plutonium Facility to include DOE Standard 5506-2021, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities*. Triad plans to incorporate implementation of Standard 5506-2021 into the project execution plan for the larger effort to upgrade the Plutonium Facility safety basis to a DOE Standard 3009-2021 compliant product. The field office previously concurred on plans for the Transuranic Waste Facility and the RANT Shipping Facility (see 5/6/2022 report).

Area G: On Thursday, the EM Field Office unconditionally approved the evaluation of the safety of the situation (ESS) for the potential inadequacy of the safety analysis related to hydrogen accumulation in closed plastic transuranic waste containers with lids (see 3/18/2022 report). The ESS contains one compensatory measure, which prevents opening any of these types of containers with potential hydrogen accumulation. This will replace the immediate operational restriction that prohibited any transuranic waste container made of plastic or with a plastic lid from being included in a waste processing plan.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 10, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussof, D. Gutowski, and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 10, 2022

Chemistry and Metallurgy Research Building: The resident inspectors joined members of the Los Alamos County Fire Department and Triad emergency management personnel for a familiarization tour of the facility. The tour covered building access, facility layout, fire alarm panels, and facility command for emergency response. Fire department personnel annually tour the high hazard facilities onsite to maintain awareness of facility conditions to support emergency response. The tour was cut short due to a fire alarm in an adjacent facility. A binder left on a furnace in the Materials Science Laboratory started smoking.

Fire Protection: Earlier this year, Triad completed a management assessment of spurious and inadvertent fire protection system alarms during the prior three-year period. During this period, the laboratory experienced approximately 100 false alarms per year that required a fire department response. Approximately 25 percent of these alarms were caused by maintenance or construction work near detection devices. The assessment identified seven opportunities for improvement with recommended actions and two noteworthy practices. Recommendations included: issuing formal event notifications and further evaluating spurious alarms, allocating funding for the replacement or additional maintenance of fire suppression systems, and adjusting work planning and control processes to reduce maintenance and construction impacts. One of the noteworthy practices is that Triad utilities personnel are in the process of installing water filling stations in lieu of hydrants for non-firewater uses such as dust suppression.

Area G–Operations: The resident inspectors observed Central Characterization Project personnel performing flammable gas measurement of transuranic waste drums in Area G using the new control set from the Justification for Continued Operations (see 8/13/2021 report). No issues were noted; the spatula-like tool that blocks the drum vent during sampling was in place for only the brief period of time needed to pull the gas sample (seconds to minutes). The new control limits the time the drum vent is blocked to ten hours or less.

Emergency Management: The NNSA Field Office completed an assessment of Triad's Emergency Management program focused on the Emergency Response Organization, termination and recovery, and readiness assurance. The assessment identified one finding related to maintaining training records for Incident Response Commanders. Triad had previously identified this issue in an assessment of their training program, and corrective actions have been developed and are being worked.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 17, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf, D. Gutowski, and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 17, 2022

Transuranic Waste Management: A. Boussouf remotely supported a DNFSB staff review of the process Waste Isolation Pilot Plant personnel use to certify transuranic waste for disposal using the Waste Acceptance Criteria. The team reviewed the certification process and walked through examples of the waste stream container review and approval specific to Los Alamos as well as other DOE waste generator sites.

Plutonium Facility–Accident Investigation: The NNSA Field Office formally transmitted the Incident Review Report for the January contamination event at the Plutonium Facility to Triad (see 6/3/2022 report). The field office requested Triad provide a corrective action plan for review and approval within 30 days that addresses all of the judgements of need from the report.

Federal Oversight–Conduct of Operations: The NNSA team that reviewed conduct of operations at the Plutonium Facility provided an outbrief to Triad personnel and field office management describing the conclusions of their assessment (see 2/25/2022 report). The field office requested the assessment earlier this year in response to concerns about conduct of operations following events last year such as the vault water bath and wet vacuum overflow events (see 4/2/2021, 7/23/2021 reports). The assessment team concluded that operations at the Plutonium Facility are substantially compliant with the requirements in DOE Order 422.1 *Conduct of Operations*, but that a high level of formality of operations is needed to support 24/7 operations for the pit production mission. They noted several issues including: weaknesses in control of equipment and system status, use of uncontrolled operator aids, and a need for improvement in training for maintenance and construction workers. The team also provided positive observations including: the recent investments in training for the expanding workforce, increased hiring and deployment of conduct of operations mentors, and implementation of oral board qualifications for working persons in charge. The team’s recommendations included: continued improvement of training especially for maintenance and construction personnel, better use of the conduct of operations mentors, and improvement to activity level work planning and control.

Area G–Safety Basis: N3B continues its efforts to develop a modern DOE-STD-3009-2014 compliant safety basis for Area G. This week, they briefed the EM Field Office manager on their progress developing an atmospheric dispersion protocol, a key input to the safety basis. Initial results are showing an increase in consequences to the public due to the methods used in the new protocol; however, N3B continues to evaluate the appropriate level of conservatism to include in this and other safety basis calculations. They plan to formally submit the completed protocol to the EM Field Office later this year for review and approval.

Wildland Fire: The Cerro Pelado wildfire west of the laboratory is now 100% contained. The Los Alamos Emergency Operations Center exited monitoring mode. Stage III fire restrictions remain in effect for the laboratory and surrounding areas.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 24, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf, D. Gutowski, and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 24, 2022

DNFSB Staff Activity: After nine years at LANL and four years at Lawrence Livermore National Laboratory, J. Plaue completed his service in the field and will be returning to DNFSB Headquarters (see 11/8/2013 report).

Flanged Tritium Waste Containers (FTWC): On Thursday, the resident inspectors observed Triad personnel resume practice for FTWC venting operations for the first time since last year. The rehearsal at TA-49 included a mock-up and walkthrough of steps for venting the FTWCs stored at Area G, and use of the remote vehicle for moving the FTWCs from the Area G storage sheds to a transport vehicle for shipment to the Weapons Engineering Tritium Facility. The rehearsal identified areas to improve the venting and loading activity.

Area G–Safety Basis: On Tuesday, the Environmental Management Field Office approved a revised safety basis for Area G. The approval included one directed change to adjust the wording of the specific administrative control for depressurization of FTWC headspace gas to ensure consistency with the Technical Safety Requirement definition. The Field Office confirmed that this version of the safety basis resolves one of the three conditions of approval from the Field Office’s conditional approval of the previous revision (see 12/10/2021 report). It incorporates revised calculations for FTWC pressurization and will allow venting to proceed. The two conditions of approval related to aircraft crash analysis remain open.

Plutonium Facility–Radiological Control: Last Wednesday, a contamination monitor detected a small particle of contamination on the arm of a Plutonium Facility worker. The particle was not detected on exit surveys from the glovebox and the lab room, but was caught at the hand and foot monitors at the facility exit. Facility personnel later held a fact-finding meeting to discuss the incident and the response. They noted that particles are especially challenging to detect and plan to reinforce the importance of having multiple layers of monitoring prior to exiting the facility.

Wildland Fire: On Thursday, Triad lowered fire restrictions on laboratory property from Stage III to Stage II. The surrounding region including Los Alamos County, Forest Service, and National Park Service also lowered fire restrictions on their land. Recent monsoonal rain events have increased moisture levels and lowered the wildland fire risk.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 1, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 1, 2022

Area G: Last Friday, the Environmental Management Field Office provided authorization for N3B to restart drill and drain operations at the Dome 231 Permacon in Area G. They did not authorize resumption of glovebag activities in the same location. The field office requested N3B submit revised procedures for the glovebag work and is withholding approval until they evaluate the submitted documents. N3B commenced deliberate hot operations for drill and drain this week; these operations have proceeded without incident.

On Monday, a worker in a tool crib turned on a heater which started sparking and smoking. The worker called 911 and notified personnel working in other parts of the building to evacuate. The fire department responded promptly. There was no fire and there is no material at risk in this building. The resident inspectors observed that a fire alarm pull station in the area was not readily accessible as it was behind a padlocked gate that had been added in the building. N3B engineering is evaluating corrective measures to fix this code compliance issue.

Chemistry and Metallurgy Research Building (CMR): Last Wednesday, two workers in CMR alarmed radiological monitors due to contamination on their personal protective equipment. There was no skin contamination or evidence of an uptake. Further evaluation found that there was a contamination spread originating from a laboratory room in Wing 7. The likely source of the contamination was a fume hood with internal contamination levels well above the threshold for routine decontamination. Radiological control technicians found contamination on the floor immediately outside of this hood which then was further spread to other laboratory rooms and the corridor through routine custodial activities. Air monitoring equipment in this room showed elevated readings which did not reach alarm levels but did exceed thresholds for evaluation by radiological control personnel. Facility personnel noted that this lab room and the fume hood were not subject to routine radiological surveys and plan to correct that and do a wider evaluation of routine survey locations. The last measurement of the face velocity for the hood was satisfactory, but on the low end so another corrective action is to retest the flow and increase it if possible. Custodial practices in radiological areas have evolved over time so those will also be reevaluated. Decontamination efforts are in progress.

Plutonium Facility–Safety Basis: On Monday, the NNSA Field Office conditionally approved the annual update to the Plutonium Facility’s safety basis. In April, the Field Office requested a resubmittal of the annual update to address review comments. In this week’s approval, the field office noted that all of their comments were adequately resolved other than one related to fire suppression system performance criteria. The condition of approval is to update the fire system performance criteria with respect to ongoing fire pump upgrade activities no later than the next annual update.

Weapons Engineering Tritium Facility (WETF): During a management self-assessment to prepare for startup of plutonium coupon studies at WETF, assessors identified that some accidents involving the test cell assembly when connected to the tritium gas handling system were only analyzing plutonium and not tritium. Safety basis personnel determined this constituted a positive unreviewed safety question and are recalculating consequences using both tritium and plutonium to see if there will be any impact on control selection.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 8, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 8, 2022

Transuranic Waste Management: In response to the titanium powder flash event of 2020 and DNFSB-TECH-46, *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at Los Alamos National Laboratory*, Triad developed a new procedure for developing and using chemical compatibility evaluations (CCE) for processes that generate transuranic waste. Using this procedure, Triad's acceptable knowledge specialists have started systematically reevaluating the approximately 50 processes that have the potential to generate transuranic waste at the Chemistry and Metallurgy Research Building (CMR) and the Plutonium Facility. A key new feature of the process is integration with the safety basis organization to inform them of any changes to CCEs. So far, Triad has evaluated four waste generating processes and entered the new information process to evaluate safety basis impacts of these processes for CMR, the Transuranic Waste Facility, and the Plutonium Facility. On Tuesday, Triad briefed the NNSA Field Office on its progress implementing this approach.

Legacy Facilities: Last Thursday, the Environmental Management Field Office unconditionally approved N3B's revised Justification for Continued Operations (JCO) that allows characterization work for Building 21-257 and the industrial waste lines in TA-21 (see 7/2/2021 report). The previous JCO had reached its termination date, and EM approved this revision to extend the JCO to the end of September. This will provide additional time to support closure of the potential inadequacy of the safety analysis pertaining to the potential for exceedance of hazard category 3 material quantities (see 8/14/2020 report).

Plutonium Facility–Readiness: The NNSA Field Office approved Triad's quarterly startup notification report. In their approval they noted that the planned campaign to harvest large quantities of heat source plutonium material was screened out of the readiness process (see 5/20/2022 report). Triad considers the activity sufficiently similar to current activities. However, the field office determined this should be considered a new activity and directed that Triad include the activity in the next startup notification report with the requirement to conduct a limited scope checklist federal readiness assessment concurrent with a contractor readiness assessment.

Plutonium Facility–Infrastructure: Last Thursday, Triad submitted to the NNSA Field Office for approval a revised draft Preliminary Documented Safety Analysis (PDSA) for facility modifications associated with a subproject for the Los Alamos Plutonium Pit Production Project (LAP4). This revision is intended to address the majority of the field office's comments on the previous submittal. Triad proposed to resolve the remaining items, including completion of fire hazards evaluations for new gloveboxes, in the final PDSA.

Plutonium Facility–Radiological Control: Last Wednesday, a contamination monitor detected a small particle of contamination on the hand of a Plutonium Facility worker. The particle was not detected on exit surveys from the immediate work location and upon exiting the basement, but was caught at the hand and foot monitors at the facility exit similar to another recent contamination event (see 6/24/2022 report). Facility personnel later held a fact-finding meeting to discuss the incident and the response. They noted that a re-evaluation of personal protective equipment and monitoring practices would be performed. This incident again reinforces the importance of having multiple layers of monitoring prior to exiting the facility.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 15, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 15, 2022

DNFSB Activity: DNFSB Vice Chair T. Summers was onsite this week accompanied by staff members A. Hutain, and M. Sautman. The Vice Chair visited the Plutonium Facility, Area G, Technical Area 21, the Chemistry and Metallurgy Research Building, The Dual Axis Radiographic Hydrodynamic Test Facility, the Waste Characterization Reduction and Repackaging Facility, the RANT Shipping Facility, the Weapons Engineering Tritium Facility, and the Emergency Operations Center. He also observed the annual emergency exercise and met with senior management from Triad, N3B, and both field offices. On Wednesday evening, he spoke offsite with local stakeholder groups to discuss their concerns with site operations.

Emergency Management: On Wednesday, Triad conducted the annual full-participation evaluated emergency management exercise. The scenario was a criticality accident in the Plutonium Facility with two workers near the event needing transport to the hospital and two workers in an adjacent room with lesser medical needs. Triad and NNSA personnel are evaluating the exercise performance.

Plutonium Facility–Infrastructure: Triad personnel upgraded the site public address system (SPAS) at the Plutonium Facility due to approaching obsolescence. The SPAS provides credited emergency paging capability and sounds emergency evacuation and fire alarms. It has a safety-significant function supporting the audible alarm for the criticality alarm system. During the final portions of the upgrade, the Plutonium Facility was in standby mode which restricts operations with material at risk. Switchover to the new system was completed this week, and the facility returned to normal operations mode.

Plutonium Facility–Accident Investigation: On Friday, Triad transmitted to the NNSA Field Office for approval their corrective action plan from the Incident Review of the January contamination event at the Plutonium Facility (see 6/3/2022 report). The plan states that responsible personnel and due dates for the corrective actions will be defined by August 2022. Key actions include re-evaluating the 2011 extent of condition on glovebox penetrations, revising command media and training to ensure better understanding of who is the owner of a glovebox, and improved training on the different types of ventilation used for gloveboxes.

Radioactive Laboratory Utility Office Building (RLUOB)/PF-400: Triad personnel transmitted to the NNSA Field Office for approval the corrective action plan and causal analysis from the federal operational readiness review supporting the transition of RLUOB to a hazard category 3 nuclear facility to be known as PF-400.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 22, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 22, 2022

Plutonium Facility–Safety Basis: On Wednesday, Triad transmitted to the NNSA Field Office, for information, an updated project execution plan for upgrading the Plutonium Facility’s safety basis to meet DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis* (see 7/19/2019 report). The updated plan includes using transuranic waste hazard evaluation methods per DOE-STD-5506-2021, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities* and adding the updated waste stream chemical compatibility evaluation process (see 7/8/2022 report). The contractor’s new safety basis submission date is May 25, 2023. The NNSA Field Office is evaluating the plan and how to manage future changes.

Plutonium Facility–Material at Risk: Facility personnel recently started a long-term effort to reduce excess material at risk in heat source plutonium laboratory areas. There are numerous containers with assorted materials stored in gloveboxes and the surrounding workspace. Personnel are starting by evaluating which materials need to be archived in the vault and which can be recycled as feed. There are many safety benefits to this activity, including improved ergonomics, reduced worker dose, and reduced material at risk.

Chemistry and Metallurgy Research Building (CMR): Last week, the decontamination and decommissioning subcontractor resumed higher hazard work in Wing 3 using improved practices for airborne and surface contamination control developed following the contamination event during a glovebox removal earlier this year (see 2/25/2022 report). Last Thursday, workers were decontaminating an area where a vacuum pump had been moved and were also disconnecting gloveboxes and hoods in the same room. The workers performing the decontamination had contamination detected on their personal protective equipment. While doffing and exiting the room, the continuous air monitor (CAM) alarmed. The workers were in respiratory protection and exited safely with no skin contamination or evidence of an uptake. The contamination did not spread into the hallway and remained in the laboratory room. In response to this event, facility and subcontractor personnel plan to retrain individuals on CAM alarm response, evaluate doffing practices including the potential use of fixative, and evaluate installing remote monitoring of CAMs as they currently only have local readouts in the laboratory rooms.

Area G–Safety Basis: Last Monday, N3B transmitted a letter to the Environmental Management Field Office for Approval requesting to extend the expiration date of four Justifications for Continued Operations (JCO) set to expire on 9/2/2022 (see 10/15/2021 report). These are the JCOs associated with 1) material at risk in pipe overpack containers, sealed sources, and Building 412; 2) mobile crane and forklift operations; 3) potentially energetic waste drums as discussed in DNFSB-TECH-46; and 4) multiple fire and seismic scenarios. As the new documented safety analysis is not expected to be completed until January next year, N3B requested an extension of the JCOs until February next year. In addition to the expiration extension, the request includes a change to the first JCO to allow for movement and removal of legacy sealed sources and a change to the third JCO to update the list of drums of potential concern. Environmental Management personnel are evaluating the request and the appropriate extension timeframe to match the expected approval of the updated safety basis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 29, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 29, 2022

Plutonium Facility–Infrastructure: The resident inspector joined facility management and the NNSA facility representatives on a walkdown of the Plutonium Facility. One purpose was to see the progress on installing new trolley controllers. The previous controllers had obsolete parts that were becoming difficult to procure even through non-traditional sources. The modern system will also provide additional capabilities for more efficient trolley operations.

The Plutonium Facility's credited diesel firewater pumps are being upgraded, partly due to issues procuring obsolete parts. One pumphouse has been upgraded and is slated to come online next month. The other will be replaced this year. This upgrade will provide improved pump performance and access to spare parts which will reduce system downtime. In addition, this modern pump design will be more familiar to a changing maintenance workforce that may lack experience with fifty-year-old pump designs.

Plutonium Facility–Conduct of Operations: During the above walkdown, the resident inspector noted that housekeeping in the basement, especially transient combustible loading, was greatly improved from previous observations (see 6/18/2021 report). Facility personnel have procured new metal boxes for staging combustible waste bags. They are also installing a tool crib to reduce the number of toolboxes cluttering the basement.

Last Friday, the NNSA field office formally transmitted to Triad the final assessment report from the NNSA Team that reviewed conduct of operations at the Plutonium Facility. The assessment team looked strategically at conduct of operations implementation. Though all objectives and criteria were considered met, the report identified several weaknesses (see 6/17/2022 report). The field office has requested a corrective action plan addressing these issues within 30 days.

Flanged Tritium Waste Containers (FTWC)–Readiness: The federal readiness assessment for venting FTWCs stored at Area G occurred in November 2020 (see 11/13/2020 report). Given timing uncertainties for closing out issues from the readiness reviews and the constraints on performing the actual activity, the readiness team recommended that an additional field proficiency demonstration be performed for them prior to startup if there was a substantial delay. On Thursday, the EM field office manager transmitted a memorandum to the startup authorization authority at EM headquarters documenting an approach consistent with this recommendation from two years ago. The proposed approach states that NNSA and EM field office personnel do not believe that reperforming a full readiness assessment is needed given the current state of the personnel, procedures, and equipment. Instead, they will perform an additional formal proficiency demonstration. The letter also notes that continued delays in venting the FTWCs at Area G will increase the risk to the workers performing venting as pressures may increase. Meanwhile, Triad personnel performed additional rehearsals with mockup FTWCs at TA-49 this week in preparation for the upcoming proficiency demonstration and actual operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 24, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf, D. Gutowski, and J. Plaue, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending June 24, 2022

DNFSB Staff Activity: After nine years at LANL and four years at Lawrence Livermore National Laboratory, J. Plaue completed his service in the field and will be returning to DNFSB Headquarters (see 11/8/2013 report).

Flanged Tritium Waste Containers (FTWC): On Thursday, the resident inspectors observed Triad personnel resume practice for FTWC venting operations for the first time since last year. The rehearsal at TA-49 included a mock-up and walkthrough of steps for venting the FTWCs stored at Area G, and use of the remote vehicle for moving the FTWCs from the Area G storage sheds to a transport vehicle for shipment to the Weapons Engineering Tritium Facility. The rehearsal identified areas to improve the venting and loading activity.

Area G–Safety Basis: On Tuesday, the Environmental Management Field Office approved a revised safety basis for Area G. The approval included one directed change to adjust the wording of the specific administrative control for depressurization of FTWC headspace gas to ensure consistency with the Technical Safety Requirement definition. The Field Office confirmed that this version of the safety basis resolves one of the three conditions of approval from the Field Office’s conditional approval of the previous revision (see 12/10/2021 report). It incorporates revised calculations for FTWC pressurization and will allow venting to proceed. The two conditions of approval related to aircraft crash analysis remain open.

Plutonium Facility–Radiological Control: Last Wednesday, a contamination monitor detected a small particle of contamination on the arm of a Plutonium Facility worker. The particle was not detected on exit surveys from the glovebox and the lab room, but was caught at the hand and foot monitors at the facility exit. Facility personnel later held a fact-finding meeting to discuss the incident and the response. They noted that particles are especially challenging to detect and plan to reinforce the importance of having multiple layers of monitoring prior to exiting the facility.

Wildland Fire: On Thursday, Triad lowered fire restrictions on laboratory property from Stage III to Stage II. The surrounding region including Los Alamos County, Forest Service, and National Park Service also lowered fire restrictions on their land. Recent monsoonal rain events have increased moisture levels and lowered the wildland fire risk.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 1, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 1, 2022

Area G: Last Friday, the Environmental Management Field Office provided authorization for N3B to restart drill and drain operations at the Dome 231 Permacon in Area G. They did not authorize resumption of glovebag activities in the same location. The field office requested N3B submit revised procedures for the glovebag work and is withholding approval until they evaluate the submitted documents. N3B commenced deliberate hot operations for drill and drain this week; these operations have proceeded without incident.

On Monday, a worker in a tool crib turned on a heater which started sparking and smoking. The worker called 911 and notified personnel working in other parts of the building to evacuate. The fire department responded promptly. There was no fire and there is no material at risk in this building. The resident inspectors observed that a fire alarm pull station in the area was not readily accessible as it was behind a padlocked gate that had been added in the building. N3B engineering is evaluating corrective measures to fix this code compliance issue.

Chemistry and Metallurgy Research Building (CMR): Last Wednesday, two workers in CMR alarmed radiological monitors due to contamination on their personal protective equipment. There was no skin contamination or evidence of an uptake. Further evaluation found that there was a contamination spread originating from a laboratory room in Wing 7. The likely source of the contamination was a fume hood with internal contamination levels well above the threshold for routine decontamination. Radiological control technicians found contamination on the floor immediately outside of this hood which then was further spread to other laboratory rooms and the corridor through routine custodial activities. Air monitoring equipment in this room showed elevated readings which did not reach alarm levels but did exceed thresholds for evaluation by radiological control personnel. Facility personnel noted that this lab room and the fume hood were not subject to routine radiological surveys and plan to correct that and do a wider evaluation of routine survey locations. The last measurement of the face velocity for the hood was satisfactory, but on the low end so another corrective action is to retest the flow and increase it if possible. Custodial practices in radiological areas have evolved over time so those will also be reevaluated. Decontamination efforts are in progress.

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Weapons Engineering Tritium Facility (WETF): During a management self-assessment to prepare for startup of plutonium coupon studies at WETF, assessors identified that some accidents involving the test cell assembly when connected to the tritium gas handling system were only analyzing plutonium and not tritium. Safety basis personnel determined this constituted a positive unreviewed safety question and are recalculating consequences using both tritium and plutonium to see if there will be any impact on control selection.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 8, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 8, 2022

Transuranic Waste Management: In response to the titanium powder flash event of 2020 and DNFSB-TECH-46, *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at Los Alamos National Laboratory*, Triad developed a new procedure for developing and using chemical compatibility evaluations (CCE) for processes that generate transuranic waste. Using this procedure, Triad's acceptable knowledge specialists have started systematically reevaluating the approximately 50 processes that have the potential to generate transuranic waste at the Chemistry and Metallurgy Research Building (CMR) and the Plutonium Facility. A key new feature of the process is integration with the safety basis organization to inform them of any changes to CCEs. So far, Triad has evaluated four waste generating processes and entered the new information process to evaluate safety basis impacts of these processes for CMR, the Transuranic Waste Facility, and the Plutonium Facility. On Tuesday, Triad briefed the NNSA Field Office on its progress implementing this approach.

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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 15, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 15, 2022

DNFSB Activity: DNFSB Vice Chair T. Summers was onsite this week accompanied by staff members A. Hutain, and M. Sautman. The Vice Chair visited the Plutonium Facility, Area G, Technical Area 21, the Chemistry and Metallurgy Research Building, The Dual Axis Radiographic Hydrodynamic Test Facility, the Waste Characterization Reduction and Repackaging Facility, the RANT Shipping Facility, the Weapons Engineering Tritium Facility, and the Emergency Operations Center. He also observed the annual emergency exercise and met with senior management from Triad, N3B, and both field offices. On Wednesday evening, he spoke offsite with local stakeholder groups to discuss their concerns with site operations.

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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 22, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 22, 2022

Plutonium Facility–Safety Basis: On Wednesday, Triad transmitted to the NNSA Field Office, for information, an updated project execution plan for upgrading the Plutonium Facility’s safety basis to meet DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis* (see 7/19/2019 report). The updated plan includes using transuranic waste hazard evaluation methods per DOE-STD-5506-2021, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities* and adding the updated waste stream chemical compatibility evaluation process (see 7/8/2022 report). The contractor’s new safety basis submission date is May 25, 2023. The NNSA Field Office is evaluating the plan and how to manage future changes.

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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 29, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending July 29, 2022

Plutonium Facility–Infrastructure: The resident inspector joined facility management and the NNSA facility representatives on a walkdown of the Plutonium Facility. One purpose was to see the progress on installing new trolley controllers. The previous controllers had obsolete parts that were becoming difficult to procure even through non-traditional sources. The modern system will also provide additional capabilities for more efficient trolley operations.

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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 5, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 5, 2022

Plutonium Facility–Transuranic Waste Management: On Thursday, facility personnel held a fact-finding meeting to evaluate an event where potential transuranic waste from a demolition activity was inadvertently staged in a low-level waste bag. Following the discovery of this discrepancy, the area was roped off to restrict access. Fact-finding participants noted that the proper waste disposal process was not adequately relayed to maintenance workers. Facility personnel also acknowledged that their current work planning processes have weaknesses in identifying material at risk during demolition activities and integrating waste planning. They plan to improve their work planning processes to address these weaknesses.

Plutonium Facility–Infrastructure: Facility personnel continue their efforts to replace the chlorine gas system in the Plutonium Facility (see 1/17/2020 report). The old system has been removed, but the new one is not operational yet. The original mass flow controllers for the new system had too large a flow range for accurate control so new ones had to be purchased and installed. There were also issues with material compatibility for sealants in the system. Programmatic personnel are preparing to go through readiness with the new system and are performing procedure walkthroughs using the new human machine interface, however until the new system is pressure tested, they cannot do a high-fidelity cold run using inert gas.

Electrical Power Interruptions: The site experienced two power interruption events last week that impacted nuclear facilities. During the first one, the Plutonium Facility experienced a brief power dip likely due to lightning. The backup diesel generators activated promptly so all safety systems remained functional. The second event over the weekend was far more widespread as a lightning strike caused a transformer to trip at the TA-5 substation. All loads from that transformer were lost as a tie circuit breaker failed to close automatically. Workers restored power after several hours by manually closing that breaker to shift the loads to another transformer. Impacted nuclear facilities that lost power included Area G, the RANT Shipping Facility, and the Transuranic Waste Facility (TWF). The Plutonium Facility did not lose power, however ancillary facilities at TA-55 did. As there were a tremendous number of alarms coming in with the widespread power losses, some notifications to on call duty officers for facilities that were unmanned at the time such as TWF and RANT were delayed for several hours. The diesel generators at TWF activated properly but did not automatically deactivate once power was restored. Facility personnel are troubleshooting the system.

Area G: This week, N3B and Central Characterization Project personnel performed transuranic waste mobile loading operations for the first time since October 2020 (see 8/27/2021 report). Fourteen drums and eight standard waste boxes were successfully loaded for shipment to the Waste Isolation Pilot Plant. Some of these containers did not meet the requirements for indoor shipping through RANT and required mobile loading. The activity was completed within the one-year timeframe for maintaining readiness.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 12, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 12, 2022

DNFSB Staff Activity: F. Harshman, one of the Board's resident inspectors at Y-12, was onsite this week to benchmark oversight approaches for nuclear facilities. Among other activities, the guest resident inspector visited the Plutonium Facility, Sigma, and the Chemistry and Metallurgy Research Building.

Plutonium Facility–Glovebox Safety: This week, facility personnel held three fact-finding meetings to evaluate three events where workers discovered glove breaches. The first event involved a Plutonium Facility worker performing a non-approved glovebox leak evaluation method. The method involved adding a second glove around the suspect glove. Though this method confirmed the presence of two separate glove leaks, one glove fixed to another is not an approved configuration and combustible loading limits within the boxes were exceeded. Facility personnel are evaluating standardizing the leak detection method used and formalizing a procedure to implement a similar detection approach to the unauthorized one used.

For the second and third events, glovebox workers detected contamination on their personal protective equipment during monitoring immediately after exiting their gloves. In all three instances, there was no detectable skin contamination or contamination spread, the impacted gloves were replaced, and the rooms were returned to normal operations.

Plutonium Facility–Safety Basis: Last Friday, the NNSA field office formally concurred with Triad's latest revision to the project execution plan for upgrading the Plutonium Facility's safety basis to meet DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis* (see 7/22/2022 report). The approval letter requested monthly status reports discussing potential schedule risks and tracking project milestones.

Flanged Tritium Waste Containers (FTWC): On Monday, Triad personnel who are trained to perform the venting activity of FTWCs stored at Area G visited the storage location with N3B personnel. One purpose of the visit was to refamiliarize the Triad personnel with emergency response actions and assembly area locations at Area G. Another was to plan equipment siting locations to remain compliant with the new controls in the Area G safety basis.

Nuclear Environmental Sites: The Environmental Management Field Office unconditionally approved the annual update to the safety basis for nuclear environmental sites. One significant change in this update was to adjust the periodicity of in-service inspections to every thirty days. The inspections visually look for degradation of the sites. Previously, there were two inspections: one annually and one after significant events. Determining what constituted a significant event caused compliance challenges (see 8/21/2020 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 19, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 19, 2022

DNFSB Staff Activity: Members of the Board's staff held a virtual meeting with Triad and NNSA Field Office Personnel as part of a review of the site-wide atmospheric dispersion protocol.

Plutonium Facility–Fire Protection: On Monday, facility personnel held a fact-finding meeting to evaluate an incident last week where facility workers accidentally struck firewater piping with equipment causing a leak. The workers notified the appropriate facility personnel, and the leak was isolated promptly. Approximately 10 gallons of firewater was discharged. Maintenance personnel replaced the impacted piping, and the fire suppression system came back online the same evening. During the meeting, participants noted that this section of piping showed evidence of having been previously struck. Facility personnel are evaluating the adequacy of low clearance postings in low clearance areas with the potential for impacts to the fire suppression system.

Plutonium Facility–Glovebox Safety: On Tuesday, a glovebox glove and support ring disconnected and pushed into the glovebox while a worker was entering the gloves. The impacted worker and other personnel responded appropriately. Radiation control technicians detected substantial contamination on the worker's coveralls. There was no detectable skin contamination or evidence of an uptake. There were also no elevated airborne readings or any detectible spread of contamination into the room. There were two similar events two years ago where a worker pushed a glove and support ring into a box (see 9/25/2020, 7/24/2020 reports). Those events occurred with oval gloveports where this week's event was a round gloveport from the same manufacturer. While the cause of this separation is still under evaluation, it does not appear that excessive force at an angle was a factor as in the previous events. There have been no recurrences of oval gloveport separations following implementation of corrective actions from those events. Facility personnel are now evaluating how to safely perform this non-routine gloveport replacement using appropriate controls.

Radiation Protection: Last Thursday, workers at the Los Alamos Neutron Science Center (LANSCE) were performing repairs due to a vacuum issue. They were performing work on a valve outside of a posted high radiation area. The valve had not been surveyed as part of establishing the high radiation area, and a radiological control technician found it had a high dose rate after the work was in progress. The workers who had been in that room had their dosimeters read, and four workers received elevated exposures with the maximum dose being greater than 500 millirem over the course of the shift. Facility personnel paused work in that area pending further evaluation of radiological control practices.

Area G: On Wednesday, the Environmental Management Field Office authorized startup of corrugated metal pipe retrieval at Area G. N3B anticipates commencing next week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 26, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending August 26, 2022

DNFSB Staff Activity: A. Boussouf provided support to the acting resident inspector at Pantex.

Transuranic Waste Facility (TWF): Last Thursday, there was a violation of the Technical Safety Requirements at TWF. Workers began moving drums in a waste storage building that was in warm standby mode (waste is present, but only limited operations are allowed) rather than in operations mode as required for moving waste drums. The building had stayed in warm standby mode due to maintenance being performed on the fire suppression system. Due to errors in communications, the facility mode was not recognized. As soon as they discovered the unallowed work, facility personnel paused the drum movements and ensured all waste was in safe condition. Facility management is evaluating means to improve communications and work release processes to prevent this type of error occurring in the future.

Work Planning and Control: Last Thursday, electrical safety officers paused work in a building adjacent to the Radioactive Liquid Waste Treatment Facility. Electricians, including vendor personnel were working on installation of radio frequency welders. The electrical safety officers noted that shorting jumpers were not installed on the capacitor bank to ensure that they were discharged. The work instructions for this task did not identify this hazard. Facility management plans to rework the instructions for this activity following a new planning walkdown with renewed attention to the scope, hazards, and controls. They also plan to reinforce rules regarding vendor participation in potentially hazardous activities. Longer term, there is an existing effort to evaluate work planning and control processes at the laboratory.

Plutonium Facility–Criticality Safety: Last Tuesday, a can containing fissile material was moved without an appropriate engineered spacer present as required. Responding personnel determined the condition was safe and allowed an immediate in the field correction to add a spacer. In the follow-up fact-finding meeting for the event, personnel noted that field correction may not have been allowable in this situation and the infraction level is being re-evaluated.

Area G: On Wednesday, N3B personnel performed an emergency response drill as part of the management self-assessment for startup of size reduction operations of corrugated metal pipes. The scenario involved a rigging failure in the Dome 375 Permacon with the winch hook disconnecting from the bag holding the corrugated metal pipe while it is being advanced to the cutting shear. The hook then struck the winch operator in the chest. Players in the drill noted this was a realistic scenario as it involved one of the more challenging movements during the planned operation. One key item identified during the drill was the need to improve radiological control practices during casualties in contamination areas.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF): On Tuesday, Triad submitted to the NNSA Field Office for approval a safety design strategy for restart of WCRRF as a hazard category 3 nuclear facility (see 5/13/2022 report). The strategy relies heavily on an inventory control to constrain accident consequences.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 2, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 2, 2022

DNFSB Staff Activity: M. Bradisse and M. Dunlevy were on site this week. They met with Environmental Management Field Office and N3B personnel to prepare for the Board's planned public hearing in November. They provided resident inspector augmentation including observations of mobile loading of transuranic waste at Technical Area 55, metal production activities in the plutonium facility, mockup practice for corrugated metal pipe size reduction at Area G, and drill and drain activities at Area G. A headquarters staff team held a follow-up call with Triad and NNSA Field Office personnel to complete the discussion on atmospheric dispersion (see 8/19/2022 report).

Plutonium Facility–Decontamination and Decommissioning: Facility personnel held a fact-finding meeting to evaluate a Tuesday event where facility workers discovered unexpected contamination. A leak was identified around two glovebox window seals while performing decontamination activities. The facility workers paused work and notified appropriate personnel. Meeting personnel noted that future decontamination work would include pre-job surveys for contamination around gaskets and removable glovebox surfaces.

Plutonium Facility–Transuranic Waste Management: On Wednesday, the staff observed transuranic waste mobile loading operations in Technical Area 55. The crew successfully loaded twenty-one pipe overpack containers into TRUPACTs for shipment to the Waste Isolation Pilot Plant. This infrequently performed activity was completed within the one-year timeframe for maintaining readiness (see 10/29/2021 report).

Plutonium Facility–Infrastructure: Facility personnel held a fact-finding meeting to evaluate an event where eighteen dropbox fire dampers unexpectedly closed during troubleshooting of a ground fault within the system. Facility personnel are working to locate the ground fault and conducting an investigation to determine the cause of the unexpected fire damper response. All eighteen fire dampers are back in service following replacement of actuated components.

Emergency Management: On Wednesday, there was an emergency preparedness training drill at the Transuranic Waste Facility. The scenario involved a fire in an electric forklift during a drum movement which caused one of the drums to deflagrate, lose its lid and release material. The forklift driver was also injured during their evacuation from the vehicle but remained ambulatory. The scenario used real meteorological conditions which led to several movements of personnel as wind conditions shifted and protective actions needed to be adjusted.

Federal Oversight: The DOE Office of Enterprise Assessments completed an assessment of specific administrative controls at the Weapons Engineering Tritium Facility. The review identified three deficiencies, one opportunity for improvement, and four positives. One deficiency was that a programmatic administrative control was used instead of a specific administrative control to protect an over-pressurization assumption in the accident analysis. One positive observation was that the plans and rehearsals for the flanged tritium waste container activity are thorough and extensive.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 9, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 9, 2022

Plutonium Facility–Infrastructure: Last Wednesday shortly after midnight, the ventilation in the Plutonium Facility experienced a loss of differential pressure. Facility personnel entered the appropriate limiting condition for operation, restricted access to the facility, and began troubleshooting efforts. They were able to restore the pressures through manual control and allowed normal access to the south half of the facility by late morning. The northern wings remained restricted as personnel continued troubleshooting efforts. This failure had many similarities to an event at the end of March (see 4/1/2022 report). In that case, damper actuators failed. In this case, the problem was with the positioners that control the damper actuators. The probable cause of the failure was water accumulation in the Instrument Air System. Personnel replaced the broken positioners with components that were installed in the plant but are no longer in use. Full access to the facility was restored by Wednesday evening. The Instrument Air System has a drying train to ensure only dry air is present. However, there were multiple issues with the drying system. One of the heat exchangers that condenses and removes water had its chilled water supply shut off for an indeterminate period. The valve for that system is normally not readily accessible; however, there is currently substantial scaffolding in the area allowing access. A moisture analyzer on the system was also out of commission. Now that ventilation is restored, facility personnel are working on an extent of condition review to evaluate water accumulation and potential component damage in other areas. They are also working to restore the drying system for instrument air and reinforce training to assure valves are not repositioned inappropriately.

On Thursday, Triad transmitted an exemption request related to seismic qualification for portions of the ventilation system to the NNSA Field Office for approval. The request specifically notes that not all components in the safety-significant system meet performance category 2 requirements for seismic hazards. The request states that these portions of the ventilation system were not upgraded during past efforts due to high cost and low safety benefit. This ductwork provides a worker safety function and is not part of the confinement boundary that is intended to protect the public during a larger performance category 3 event.

Flanged Tritium Waste Containers (FTWC): This week, Triad personnel demonstrated FTWC venting and handling activities for federal assessors per a 2020 federal readiness assessment recommendation (see 11/13/2020 report). Environmental Management personnel were present throughout the evolution and will provide their observations to the startup authorization authority. The demonstration included the use of a new, four-legged, canine-inspired robot replacing a human spotter during the lifting and moving of FTWC containers with the remote vehicle.

Area G: On Thursday, N3B personnel commenced retrieval of corrugated metal pipes (CMP) from their burial pit. Following retrieval of the CMPs, they will be sheared into segments that can fit into standard waste boxes for shipment to the Waste Isolation Pilot Plant for disposal. This week, N3B personnel also completed a management self-assessment to prepare for upcoming formal readiness reviews to support the startup of this size reduction activity.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 16, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 16, 2022

DNFSB Staff Activity: Staff members M. Bradisse, K. Deutsch, D. Grover, T. Koshy, P. Natividad, J. Plaue, and R. Wu were on site to gather information to support the Board's upcoming public hearing. They held meetings with NNSA Site Office and Triad personnel to discuss safety systems and safety management programs at the Plutonium Facility and how those will be able to support the pit production mission. They also walked down the Plutonium Facility with an emphasis on safety systems and any upgrades to said systems.

Area G: Last Thursday, which was the first day of corrugated metal pipe (CMP) retrieval activities, a worker experienced heat related illness. Other workers aided the individual, moved them from the excavation area, rehydrated them, and requested a medical response. N3B management paused CMP retrieval operations and held two fact-finding meetings related to this event. There were many factors leading to the incident. Temperature monitoring was outside, and there was none inside the much hotter excavator cab. The air conditioning in the excavator cab has been broken for some time, but this was not recognized by all individuals at the work site. There were several unexpected conditions found as the excavation commenced including additional frameworks buried with the CMPs and a damaged end cap on the first CMP. Workers appropriately paused and evaluated each of these anomalies; however, this led to an extended amount of time without any hydration breaks. On Tuesday morning, N3B paused all field activities in Area G with the exception of required safety and compliance activities while they evaluate corrective actions from this heat illness incident. The pause remains in effect.

Plutonium Facility–Radiological Control: Late last month, there was a continuous air monitor alarm during bagout activities at the Plutonium Facility. The workers were bagging out heavy glovebox door assemblies including counterweights when a bag failed. All of the workers were in respirators, and there was no evidence of an intake or any skin contaminations. Facility personnel are evaluating bagout techniques to avoid further incidents with heavy objects being removed from glovebox lines. Options under evaluation include stricter limits on the number of items in a bag, use of thicker bags, or loading to a waste drum rather than doing bagouts. There will be many more of these assemblies in the waste stream as the facility is moving towards a new type of glovebox door design. A frayed cable connecting the counterweight to the door was the culprit for an injection intake in 2018 (see 2/8/2019 report). Following that event, facility personnel replaced aging cables and placed additional crimps around their ends to reduce the puncture hazard. The new door design being installed eliminates the cables entirely.

Plutonium Facility–Criticality Safety: On Wednesday, the NNSA Field Office concurred with Triad's latest memo regarding criticality safety in the basement of the Plutonium Facility. The memo documents the basis for why leakage of fissile solutions from aqueous processing laboratories on the first floor and subsequent formation of a critical geometry in the basement is not credible during a seismic event (see 8/13/2021 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 23, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 23, 2022

Area G: On Tuesday, N3B management authorized resumption of field activities in Area G with the exception of corrugated metal pipe retrieval (see 9/16/2022 report). During the pause, facility personnel held safety briefings and reviewed procedures to assure that job hazards were all fully identified and integrated. Authorized work resumed deliberately under senior supervisory watches. The job hazards for corrugated metal pipe retrieval are still under evaluation.

Plutonium Facility–Decontamination and Decommissioning (D&D): There were two recent issues identified during D&D activities in a laboratory room that is being repurposed. Both events involved a hood that is being decontaminated. Glove changes and decontamination activities in this hood led to non-compliance with transient combustible controls and work control practices for activities during material inventory. The hood has no allowance for transient combustibles, meaning any items such as gloves or waste bags must be removed or containerized unless attended. Glovebox gloves from the changeout and waste from decontamination were left in the hood. Access to this room is currently restricted due to radiological concerns with the waste bag. Fact finding meetings this week related to these events identified several areas for improvement. Many different organizations are involved in D&D, and the communications between them to ensure that all requirements are met was a major item noted for improvement. Also, glovebox/hood ownership remains a concern similar to an issue identified in the accident investigation earlier this year (see 6/3, 7/15/2022 reports).

Plutonium Facility–Conduct of Operations: On Wednesday, facility personnel held a fact-finding meeting to investigate a lockout tagout (LOTO) procedure violation after facility workers discovered a damaged circuit breaker lockout pin. Participants identified several concerns: 1) poor key-keeping practices, 2) locks being used by other than the authorized worker, 3) evidence of tampering with a locking mechanism, and 4) workers unfamiliar with site LOTO policies and practices. Facility management paused work on the impacted project pending re-training of workers on LOTO policies and procedures, and completion of an extent of condition.

Fire Protection: Last week, the NNSA Los Alamos Field Office approved the 2021 *Los Alamos National Laboratory Baseline Needs Assessment for Fire Protection and Emergency Response* with three conditions of approval. The updated assessment includes the current DOE-Los Alamos County Cooperative Agreement for fire department emergency services, contract adoption of DOE Order 420.1C Chg. 3, *Facility Safety*, and changes since the last assessment. The report describes the poor condition of two of the county's fire stations and includes a discussion on plans for replacement. The field office's conditions of approval are 1) the development of a conceptual staffing plan for upcoming fire station replacements within six months, 2) the closure of NNSA review comments in the next revision of the document, and 3) an explanation of the technical need and justification for recently procured firefighting robots in the next revision.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 30, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending September 30, 2022

Transuranic Waste Facility (TWF): Last Thursday, as part of an extent of condition review of work release from a previous event, TWF personnel identified another violation of the facility's Technical Safety Requirements related to work allowed during different facility modes (see 8/26/2022 report). Flammable gas analysis had been performed in a building in cold standby mode. The Technical Safety Requirements only allow that activity to be performed at a location in warm standby or operations mode. Facility management is evaluating whether flammable gas analysis can be separated from flammable gas sampling and be an authorized activity for cold standby.

Weapons Engineering Tritium Facility (WETF): On Tuesday, WETF management declared a violation of the facility's Technical Safety Requirements. They identified that in-service inspections for two safety-class tritium containment vessels were not performed within the required five-year periodicity. Facility personnel identified these vessels as due for inspection during a recent walkdown, but the incorrect due dates were placed on facility status boards. Facility personnel completed the inspections soon after the discrepancy was discovered. The results were satisfactory. Facility management is planning to adjust their procedure for status board updates to help prevent recurrence of a similar event.

Plutonium Facility–Fire Protection: On Wednesday, the resident inspector accompanied facility personnel on a management observation verification walkdown focused on chemical inventory control including storage in flammable cabinets. During the walkdown, the resident inspector noted that a suspended leak diaper, installed due to a prior spill (see 7/23/2021 report), was in excess of obstruction limits defined by the National Fire Protection Association. This diaper could impede the discharge pattern of several sprinklers in the basement. Facility management is evaluating how to fix this non-compliance. The members of the walkdown also opened flammable liquid storage cabinets in the basement to observe internal conditions and storage practices.

Radioactive Liquid Waste Treatment Facility (RLWTF): A seven member contractor team commenced a readiness assessment to support resumption of transuranic waste drumming operations activities at RLWTF. These activities have not been performed since 2014 (see 1/21/2022 report) when the Waste Isolation Pilot Plant was shut down after an accident. The process needs to resume to support stabilization of the transuranic fraction of liquid waste coming from the Plutonium Facility.

Area G: The Environmental Management Field Office authorized startup of glovebag operations in Dome 231 following their review of N3B's revised procedures (see 7/1/2022). Actual performance of this activity is not starting immediately as personnel are focusing on drill and drain activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 7, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 7, 2022

Radioactive Liquid Waste Treatment Facility (RLWTF): The contractor team assessing readiness to restart transuranic waste drumming operations at RLWTF completed their review and briefed facility management on their preliminary findings. The draft report identified seven pre-start findings and one post-start finding. Key findings included: the preventive maintenance program is not effectively implemented, several defense-in-depth controls in the safety basis are not implemented in accordance with the facility engineering processes manual, and the facility did not demonstrate effective, integrated procedural command and control for the full scope of drum tumbling operations. The team recommended the operation could restart following issuance of the final report closure of the pre-start findings.

Last Tuesday, during excavation work to support the Transuranic Liquid Waste project, an excavation subcontractor contacted and damaged an effluent line for the new Low-Level Liquid Waste Facility. The proposed cause for the strike on this line, whose location had been identified through potholing, was distraction due to other unexpected conditions in the excavation area. The damaged line has never been used to transport radioactive liquid waste as the Low-Level Liquid Waste Facility has not commenced hot operations yet. RLWTF management paused work on the excavation activities pending corrective actions by the subcontractor. Other lines within this excavation area are in use and radioactively contaminated. While evaluating this event, personnel noted that some of the unexpected conditions were due to installations associated with the Low-Level Liquid Waste Facility not using standard practices associated with the placement of test stations and marking new buried lines.

Plutonium Facility–Criticality Safety: On Thursday, facility personnel held a fact-finding meeting to discuss weighing practices during waste bag-out operations where a gross weight measurement is taken on top of a fissionable material transport cart. This long-standing weighing method is not defined in the criticality safety evaluation or the posting for the carts. Waste bag-outs in locations that rely on this method are paused until further review.

Weapons Engineering Tritium Facility (WETF): The NNSA Field Office unconditionally approved the safety basis addendum supporting plutonium coupon studies at WETF. This revision to the addendum resolved the issue regarding analyzing accident consequences for both tritium and plutonium identified during the management self-assessment (see 7/1/2022 report).

Emergency Management: Last week, the NNSA Field Office concurred that Triad successfully closed all corrective actions to address the 2019 Office of Inspector General report that identified weaknesses in pre-incident planning. One action taken by Triad is creating a Pre-Incident Plan Program integrated with the Geographic Information System, which incorporates critical facility information including, floor plans, fire alarm panels, fire detection systems, as well as a visual based document for quick access to critical information.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 14, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 14, 2022

N3B–Electrical Safety: On Thursday, N3B management stopped all work in their facilities with the exception of minimal safety and environmental compliance activities. This stop work was due to concerns with formality of operations. The Environmental Management Field Office is currently finalizing a conduct of operations assessment focused on electrical and lockout tagout practices. Field Office personnel have communicated preliminary concerns regarding training deficiencies and a lack of knowledge among electrical workers. In response, N3B personnel began self-assessing their electrical practices. This led to management pausing all electrical and lockout tagout activities, then stopping those activities, then stopping all work other than minimum safety and compliance tasks. While work is curtailed, N3B management is reinstating the senior management review process for releasing any work beyond that needed for minimum safety or compliance. They used this process in 2021 when activities were curtailed due to copious safety basis issues.

Plutonium Facility–Electrical Safety: While bagging out waste items, facility personnel discovered two potentially energized capacitors. They paused and reported the discovery. The exact provenance of the capacitors is not known, but they likely came from a blending machine that was size reduced earlier in the year. If the capacitors were fully charged, their stored energy would have exceeded the threshold for a hazardous energy source. Facility personnel have since discharged the capacitors to a safe condition. Transuranic waste specialists are determining whether any adsorbent is needed for the mineral oil in the capacitors. Proposed corrective actions to prevent recurrence of a similar event include additional emphasis on the use of equipment specifications during work planning for size reduction and another round of training on capacitor safety especially for personnel working with transuranic waste.

Plutonium Facility–Criticality Safety: While moving an item into a storage carousel in a glovebox, workers discovered that one of the storage locations was not latched shut per requirements, and the latch was not functional. They paused and reported the discovery. The identified condition violated the criticality safety posting for the glovebox, which forbids non-functional latching mechanisms and staging of items outside of a secured storage location. The non-compliant condition has been resolved, and facility personnel are evaluating better documentation of the expected criticality safety requirements for this box. Personnel who use the storage carousel also noted that its software control system is not reliable. They have provided this information along with a recommendation for a manual movement system to the Los Alamos Plutonium Pit Production Project, which will be installing several more storage carousel boxes of this type.

Onsite Transportation: On Wednesday, the NNSA Field Office requested that Triad provide an impact assessment for proposed compensatory measures to increase the safety of onsite shipments of nuclear material. NNSA provided a series of potential compensatory measures that could strengthen the existing controls in the onsite transportation safety document. Options for compensatory measures included: tying material at risk limits in shipments to packaging configuration, restricting or eliminating the use of wooden pallets, and strengthening pre-transfer checks for hazards along the route.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 21, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussof and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 21, 2022

DNFSB Staff Activity: The Resident Inspectors were in Washington, D.C. to brief the Board and attend meetings. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 28, 2022

MEMORANDUM FOR: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending October 28, 2022

DNFSB Staff Activity: Staff member R. Jackson was onsite to attend a workshop on the Plutonium Facility Seismic Performance Reassessment Project. Staff member Y. Li attended remotely.

Plutonium Facility–Fire Protection: The resident inspectors accompanied facility management on their weekly management observation verification walk-through and suggested evaluating fire barrier features as part of the walk-through. During this activity, a resident inspector identified an unsealed penetration through a credited fire barrier between one of the laboratories and the basement. The hole had been drilled as part of a construction activity; however, the required firestop seal was not promptly installed. Facility engineering personnel had previously identified this penetration and submitted a service request to have a temporary three-hour fireproof seal installed. Facility management is following up on why this temporary seal has not been installed and whether the permanent seal can be installed expeditiously.

Plutonium Facility–Infrastructure: Last week, Triad submitted the revised Preliminary Documented Safety Analysis for the Los Alamos Plutonium Pit Production Project (LAP4) to the NNSA Field Office for approval. This revision is intended to address previous comments from the Field Office and to incorporate details from the final design (see 7/8/2022 report). This week, the NNSA Field Office approved Revision 4 of the Safety Design Strategy for LAP4 which has no major changes.

Last week, the NNSA Field Office approved a temporary modification to the Plutonium Facility's safety basis to support the upgrade of the Facility Control System (FCS). The FCS is a safety-significant system that supports operation of the facility's ventilation system. It also supports other facility systems such as the criticality alarm system and fire suppression system, but these functions are not credited safety functions. The current FCS was installed in 1996 and obtaining obsolescent parts is becoming a challenge. The first three phases of the FCS upgrade could be performed while the facility was in a limited operations mode. The final two phases, which involve commissioning, testing, and surveillances of the new system, will be performed in operations mode under the new temporary modification. The modification revises the limiting condition of operation for ventilation system operability to allow additional flexibility in operating the facility without a fully functional FCS during the transition. The approval included one directed change to clarify that the temporary modification only applies during phases four and five of the upgrade following the completion of phase three, in which the new FCS is connected.

Emergency Management: On Tuesday, there was an emergency preparedness training drill at the Chemistry and Metallurgy Research Building. The scenario involved a worker who was manipulating a pallet of transuranic waste drums falling off a loading dock with the drums. The worker received a compound fracture while a drum lost its lid and spilled some of its contents. The injured worker and one other were contaminated. Drill participants noted many potential improvements during their hotwash following the conclusion of the activity. Field drills at nuclear facilities were infrequent during the pestilence (see 7/16/2021 report). Meanwhile there has been tremendous staffing growth and turnover such that many personnel have never participated in emergency preparedness drills or are in new roles with different responsibilities during emergency events.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 4, 2022

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending November 4, 2022

Staff Activity: Members of the Board's staff participated in a virtual briefing with the Board, DOE/NNSA Headquarters, and the Los Alamos Field Office to discuss DOE's response to the January 6, 2022 letter addressing concerns with the adequacy of LANL's Transportation Safety Document and the onsite transportation safe harbors in 10 CFR 830.

Plutonium Facility–Infrastructure: This week, facility personnel held a meeting to discuss concerns with scaffolding. Workers had discovered several quality issues on a scaffold that had been erected and released for work. During the meeting, participants noted that the pre-job inspection process is not well defined, and that workers rely on skill of the craft rather than written criteria when releasing an erected scaffold for work. Given the large number of ongoing construction activities, facility personnel plan to re-evaluate the scaffold inspection criteria and are considering increased use of an existing checklist for each pre-job inspection.

N3B–Stop Work: Last week, N3B released several activities that had been previously stopped (see 10/14/22 report). The resumed activities included transuranic waste container movements to support mining, characterization, remediation, and shipping, as well as the central characterization program's performance demonstrations. In addition, transfers for weight certification, nondestructive assay/examination, and shipments to the RANT facility were resumed.

This week, N3B resumed shipping mixed low level waste, repackaging waste liner from one of the domes, and overpacking waste containers. Currently, corrugated metal pipe retrieval, drill and drain, dome reskinning, and activities requiring lockout tagout are still stopped.

Safety Basis: On Tuesday, Triad transmitted its methodology for calculating leak path factor and atmospheric dispersion to the NNSA Field Office for review and concurrence. This methodology will be part of the mitigated accident analysis in the new TA55 Documented Safety Analysis (DSA) being developed using DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*. The new methodology couples the leak path factor and atmospheric dispersion factor. In addition, the analysis would increase the wind direction resolution from 8 points to 16 points and provide more granularity at lower wind speeds.

On Wednesday, the NNSA Field Office approved the Technical Area (TA) 55-DSA-2020-R1 Addendum 4, and the TA55-TSR-2020-R2, Technical Safety Requirements (TSRs) with no conditions of approval or direction. The addendum addressed changes to equipment in the Plutonium Facility to accommodate activities currently performed in the Chemistry and Metallurgy Research Building. This will require adding gloveboxes and equipment for multiple processes including dry powder handling, material characterization and analytical chemistry, machining, casting and molten operations, and primary confinement.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 11, 2022

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending November 11, 2022

Plutonium Facility–Emergency Response: Last Wednesday, the newly installed chlorine delivery system was brought online and used for the first time (see 8/5/2022 report). The system was then shut down, valves were isolated, and chlorine lines were purged without incident. Approximately six hours later during the night shift, chlorine was detected in the chlorine cylinder cabinet with a peak concentration of 0.7 parts per million. A responding worker also reported smelling chlorine in a laboratory room. The facility operations center contacted the emergency operations support center who issued a shelter in place order for surrounding buildings. Initially, personnel believed that residual chlorine in the line may have leaked, triggering the alarm. On Monday, a fact-finding meeting was held to discuss the event. Participants identified several issues: the local alarm readout provided conflicting information regarding the location of the potential leak while the readout in the operations center had the correct information, the detection system does not communicate real-time chlorine concentrations to the operations center, and there were miscommunications between different responding organizations in providing meteorological data. After the meeting, facility personnel concluded that the likely cause of the alarm was due to transient vehicle exhaust fumes from nearby idling vehicles rather than a chlorine leak as there was no evidence of any pressure changes in the system.

Radiological Laboratory Utility Office Building (RLUOB)/PF-400: The NNSA Field Office, with support from an independent NNSA Headquarters and NNSA Sandia review team, approved the revised corrective action plan to address findings from the federal readiness assessment to startup RLUOB as a hazard category 3 nuclear facility to be known as PF-400. Field Office personnel provided copious commentary on the original corrective action plan and causal analysis (see 7/15/2022 report). In general, their commentary focused on corrective actions not being specific enough or obviously flowing from the causal analysis. The revised documents adequately addressed these concerns.

Emergency Management: The NNSA Field Office approved the contractor's corrective action plan to address two of the issues from the annual emergency exercise (see 7/15/2022 report). These two issues tied directly to the operations of a defense nuclear facility (the Plutonium Facility) and thus required a formal corrective action plan. The first finding was that the initial operational emergency notification form identified the wrong community location for protective action recommendations. Corrective actions included enhanced means to correct errors and new data validation processes to assure accuracy prior to issuance. The second finding was that workers in the Plutonium Facility did not all exit from the closest facility exit point. Corrective actions included revising evacuation maps and enhancing emergency training for facility workers.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 18, 2022

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending November 18, 2022

Board Activity: On Wednesday, the Board held a public hearing in Santa Fe, New Mexico. The hearing included four sessions. The first gathered information from a panel of Office of Environmental Management and N3B personnel on the status of the activities performed by the Department of Energy's Office of Environmental Management at the Area G transuranic waste management facility. The session also included a public comment period. The second and third sessions involved NNSA and Triad personnel discussing the production activities to be conducted in the Plutonium Facility, the nuclear safety risks the NNSA has accepted, and the state of planned safety improvements to safety system infrastructure and safety programs at the facility. The fourth session took additional commentary from members of the public.

On Tuesday, the Board members and accompanying staff were onsite. They held meetings with Triad, N3B, NNSA, and Environmental Management personnel and toured the Plutonium Facility. The tour included several laboratory rooms supporting the pit production mission, transuranic waste movement, and the americium separation process. They also looked at safety systems including fire suppression system upgrades, the ventilation system, and the uninterruptible power supply system.

While in New Mexico, the Board members also spoke with members of local stakeholder groups.

N3B–Stop Work: N3B management has reviewed and released all work other than electrical and lockout/tagout activities (see 11/4/2022 report). At Area G, drill and drain activities in the Dome 231 Permacon have resumed following their release. Retrieval of corrugated metal pipes is also now released, and workers performed a mockup activity this week in preparation for resuming hot operations.

Plutonium Facility–Criticality Safety: On Tuesday, facility workers discovered a non-compliance with the mass requirements from the criticality safety posting for a safe in a laboratory room. The workers paused and reported the discovery. The safe has drawers that are partitioned into two sections, and the mass limits for criticality safety apply to each location. Two items were in one section and exceeded the mass limit. The day prior, workers were rearranging items in the safe to support non-destructive assay activities and inadvertently moved the two items into the noncompliant configuration. This over-mass condition is bounded by the upset scenarios in the criticality safety analysis for the safe. Workers restored the safe into compliance and returned it to operations. In order to prevent recurrence of similar events, facility personnel are evaluating corrective actions including driving consistency between the location definitions for criticality safety and material accountability.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 25, 2022

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending November 25, 2022

Plutonium Facility–Safety Basis: Last Thursday, Triad submitted to the NNSA Field Office for review draft portions of the new safety basis under development for the Plutonium Facility. This submittal included the site characteristics and site description as well as their planned methodologies for performing the hazard analysis. The project execution plan for updating the safety basis includes a commitment for Triad to periodically share key documents with the Field Office staff. The purpose of this sharing is to inform the Field Office of the approaches Triad is making with the new safety basis before the Field Office begins their review of the final submission.

Last Wednesday, the NNSA Field Office approved the Preliminary Documented Safety Analysis (DSA) for the Los Alamos Plutonium Pit Production Project 30 Base (LAP4 30B) with no conditions of approval or directed changes.

Weapons Engineering Tritium Facility (WETF): The resident inspector was accompanied by WETF operations management on a walkdown of the facility. The focus of the walkdown was to observe the general condition of passive fire protection features, such as fire walls, fire doors, and fire dampers. The current DSA and Technical Safety Requirements for the facility require that certain interior walls be maintained as 1-hour fire rated walls, separating the tritium processing, handling, and storage areas. Overall, the resident inspector noted that these systems appeared robust, well maintained, and in good working order. Some areas for improvement were identified and discussed with facility personnel, specifically in the labeling and tracking of penetration seals, as well as acceptable ways of filling open holes in fire doors.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 2, 2022

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending December 2, 2022

Staff Activity: Staff members W. Dumayas and R. Jackson were at the University of Nevada, Reno to observe testing of cast iron fittings. These fittings are expected to be the most vulnerable components of the Plutonium Facility's fire protection system during seismic loads. Additional analysis will help determine their expected performance during a seismic event and whether any upgrades are needed.

Los Alamos Neutron Science Center (LANSCE)–Emergency Response: On Monday morning, a fire broke out in a computer numerical control (CNC) machine at a non-radiological LANSCE machine shop. A machine shop employee extinguished the fire, the equipment was shut down and the building was evacuated. The Los Alamos fire department responded to the scene and released the facility soon thereafter. The following morning, facility personnel held a fact-finding meeting to discuss the incident. Meeting participants noted that the CNC machine had likely sent a spark into accumulated aluminum shavings, acrylic shavings, and possibly lubricating oils. The operator's account of the incident identified that they first attempted to extinguish the flames with a pressurized air hose, followed by use of liquid coolant, and finally, successfully extinguished the flames with a nearby dry chemical fire extinguisher. Meeting participants noted that fire was not a hazard identified in the controlling work documents and questioned housekeeping practices as large amounts of excess machined shavings had been allowed to accumulate in the assembly. The resident inspectors visited the machine shop and noted that the CNC machine where the fire occurred had a substantial quantity of thin shavings inside its enclosure, in addition to two large combustible containers filled with shavings adjacent to where the fire occurred. Facility management noted that a more stringent cleaning regimen is under evaluation.

Plutonium Facility–Conduct of Operations: Two weeks ago, a construction worker found a damaged locking device for lockout/tagout with an intact lock in a toolbox in the basement. The worker turned it in to the facility's operations center. There is no obvious damage to the system the lock had been installed on. This week, facility personnel held a fact-finding meeting to evaluate the event. The worker who placed the lock has not been with the laboratory since early 2022, and there is no conclusive determination of when and how the locking device was intentionally removed without authorization. This is the second recent instance of unauthorized removal and damage of locking devices at the Plutonium Facility (see 9/23/2022 report). Lockout/tagout training has been ramping up with additional in-person training to support the growing workforce, to return to normal practices following the reduction of in-person classes during the pandemic, and as a corrective action from the September incident.

Plutonium Facility–Safety Basis: On Thursday, Triad submitted the revised temporary modification to the Plutonium Facility's safety basis to support the upgrade of the Facility Control System. The revision addresses the NNSA Field Office's directed change to clarify the applicability of the temporary modification from their approval of the previous revision (see 10/28/2022 report).

Area G–Stop Work: Electrical and lockout/tagout work are now released to be performed at Area G (see 11/18/2022 report). Said work must be performed under the oversight of a senior supervisory watch. N3B's senior management review process remains in place for any emergent work activities that have not been reviewed and released yet.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 9, 2022

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending December 9, 2022

Staff Activity: Staff members C. Beaty, J. Heath, and L. Lin were onsite this week for an initial visit to support a review of decontamination and decommissioning (D&D) at the Plutonium Facility and the Chemistry and Metallurgy Research Building.

Plutonium Facility–Fire Protection: On Thursday, the resident inspectors identified approximately 40 flammable gas cylinders staged outside of the Plutonium Facility in a configuration that violated the minimum separation distance from oxygen cylinders. The resident inspectors notified facility operations management of the issue. The improper staging of flammable cylinders outside of the Plutonium Facility has been a recurring issue; the resident inspectors identified a similar non-compliance on the other side of the facility in July which has been resolved.

Plutonium Facility–Criticality Safety: On Thursday, workers identified that some units of one model of water-resistant containers used to store nuclear material in the Plutonium Facility had lids that were not secure even after proper closure. They informed criticality safety personnel as this type of container is widely used in areas where the criticality safety evaluation requires water resistant containers or containers that remain closed while in transit. Further inspection of units of this container model suggested that the poor closure may be specific to a large batch of recently purchased containers that have minor differences from previous purchase batches evident on visual inspection; there is no obvious visual distinction between functional and non-functional containers within the same batch. Facility personnel are inspecting containers in use and restricting procurement and distribution of new containers while they determine whether there was a specification change or procurement error with these containers.

Plutonium Facility–D&D: On Tuesday, the resident inspectors and staff review team observed a cold mockup demonstration for the removal, downsizing, and disposal of criticality-safe geometry cylindrical tanks (pencil tanks). The demonstration involved the cutting of metal piping of a similar material and geometry inside a glovebag. Triad D&D personnel shared lessons learned from their mockup activities, discussed hoisting logistics, and the planned safety protocols for the activity. Pencil tank D&D in the Plutonium Facility is scheduled to start in 2023.

Chemistry and Metallurgy Research Building (CMR)–D&D: Glovebox removal activities in CMR are not being performed this fiscal year. In August, transuranic waste management personnel expressed concerns with the planned strategy to package gloveboxes with lower activity items from the same rooms to be disposed of as low-level waste. They considered that there was a substantial likelihood that some containers could exceed limits for transuranic waste and would then have to be opened and repackaged. Waste management personnel are currently preparing acceptable knowledge documentation for waste generation from glovebox D&D at CMR. Once that is complete, the approach to resuming glovebox removal will be developed. Meanwhile, the D&D subcontractor is performing lower risk low-level waste removal activities in CMR.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 16, 2022

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending December 16, 2022

Onsite Transportation: Last Friday, Triad submitted their response to the NNSA Field Office regarding incorporating compensatory measures to increase the safety of onsite shipment of nuclear material while DOE reevaluates its approach for developing transportation safety documents complex-wide (see 10/14/2022 report). The Field Office's letter included a copious list of potential compensatory measures to evaluate for feasibility and impact. Triad's response stated that they completed an evaluation of potential compensatory measures and concluded that, in their opinion, they already perform such actions as part of normal transportation activities. Therefore, the response stated that the only change needed is to elevate such items into the controls in the Transportation Safety Document. The Field Office is evaluating the response.

N3B–Stop Work: Last Thursday, N3B management stopped work on all hoisting and rigging activities. While following up on questions from a DOE Headquarters assessment, N3B personnel determined that their program was not compliant with the DOE standard on hoisting and rigging. N3B personnel are currently reviewing job hazard analyses for activities using hoisting and rigging and performing a review of their program.

Plutonium Facility–Criticality Safety: On Thursday, facility personnel held a fact-finding meeting to discuss a Tuesday incident where glovebox workers introduced an item into a glovebox exceeding the mass limit on the criticality safety posting. Meeting participants noted there was a miscommunication when switching one glovebox worker with another who then assumed the glovebox contained no fissile material. Also, another worker transferring material from the intro hood into the glovebox line accidentally touched the receiving glove and their personal protective equipment was contaminated. Criticality safety personnel determined this was an analyzed upset condition, and workers restored the glovebox into compliance and returned it to operations. In order to prevent recurrence of similar events, facility personnel are evaluating corrective actions including splitting up cold entries from special nuclear material entries, using more senior persons in charge for jobs, and treating this entire glovebox train as one area for future moves.

Emergency Management: On Thursday, there was an emergency preparedness training drill at the emergency operations center. This served as a proficiency drill for several new emergency response organization personnel. The scenario involved a flanged tritium waste container (FTWC) transport vehicle accident caused by the driver taking an evasive maneuver to avoid a herd of elk in the road. The truck flipped over, and the contents of the FTWC were released into the atmosphere. The driver of the vehicle suffered injuries, including lacerations and a broken arm, and two elk were killed. Participants identified potential improvements including ensuring the proper identification of affected facilities for shelter-in-place actions (two were missed) and performing accountability of N3B personnel in the vicinity of the accident location.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 23, 2022

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending December 23, 2022

Waste Characterization, Reduction, and Repackaging Facility (WCRRF): Last Monday, the NNSA Field Office conditionally approved a revised safety design strategy that supports the restart of WCRRF as a hazard category 3 facility (see 8/26/2022 report). The Field Office provided eight directed changes in their approval. These changes included the following requirements: to perform a baseline functionality assessment on selected systems, submit selected codes of record for every design change, and evaluate previously approved exemptions to safety standards at the facility.

Plutonium Facility–Radiological Control: Last Wednesday, while performing maintenance on a glovebox oxygen monitoring system, a worker noticed a breach in one of their glovebox gloves. A responding radiological control technician found contamination on the worker's personal protective equipment. On Monday, a fact finding was held to discuss the incident. During the meeting, participants noted that a furnace in proximity to the oxygen monitoring system was on during this maintenance evolution. Work control documents for this activity did not include the hazards associated with working near an operating furnace, and the worker had not donned overgloves as normally required when working near a hot furnace. Facility personnel are considering several corrective actions, including updating work planning documents to include furnace hazards, limiting the scope of maintenance activities when a furnace is on, and providing additional operator aids to indicate the status of the furnace.

Criticality Safety: On Tuesday, the NNSA Field Office unconditionally approved a revision to Triad's Criticality Safety Program. The main change in this revision is a substantial increase in the de minimis values of nuclear material below which activities do not need a formal criticality safety evaluation. For example, the new program documentation has a de minimis value of 25 grams of plutonium compared to the previous value of one gram. NNSA personnel identified no concerns with the technical basis behind this change during their review.

Transuranic Waste Facility (TWF)–Safety Basis: Triad submitted a revised TWF safety basis to the NNSA Field Office for approval. One significant change in the revision is a corrective action from the violation of the technical safety requirements related to flammable gas sampling and analysis being performed in an unauthorized facility mode earlier in the year (see 9/30/2022 report). The new revision splits flammable gas sampling and analysis into two separate activities and allows the analysis of samples to be performed in all facility modes as material at risk is not present during analysis. Flammable gas sampling still must be done in warm standby or operations mode. Another significant change was to the limiting condition for operation when the electric fire pumps are inoperable. This change was due to damage caused by a lightning strike, which took significant time to repair (see 8/6, 8/27/2021 reports). The new revision proposes allowing 90 days to restore a pump to operability and adds in a fire watch and opening a valve to the domestic water supply, which should allow sprinklers to activate at reduced pressure while the pumps are inoperable. The previous time to restore operability was 7 days.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 30, 2022

MEMORANDUM FOR: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for Week Ending December 30, 2022

Year in Review: A summary of the key developments of 2022.

- The DNFSB Los Alamos Office welcomed a new resident inspector, A. Boussouf, and marked the departure of J. Plaue, who returned to headquarters.
- The Board held a public hearing in Santa Fe to explore the safety posture at the Plutonium Facility and transuranic waste operations at Area G.
- NNSA accepted a safety basis to support receipt of large quantities of heat source plutonium at the Plutonium Facility with an “exigent condition” where worst-case consequences exceed DOE’s evaluation guideline for postulated consequences to the public.
- In May, the Emergency Operations Center partially activated in response to the Cerro Pelado wildfire west of the laboratory. The fire was contained in June without any significant impact to the laboratory.
- Both Triad and N3B continued regular shipments of transuranic waste containers primarily through shared use of the RANT Shipping Facility. Shipments of transuranic waste exceeded generation for the year.
- N3B performed work at Area G under several Justifications of Continued Operations while they continue developing a modern safety basis. Drill and Drain, Glovebag, and Corrugated Metal Pipe retrieval activities all went through readiness reviews in preparation for restart.
- In the fall, N3B management implemented a stop work to address safety concerns with conduct of operations, especially electrical safety and lockout/tagout. Work resumed following management review and corrective actions. In December, N3B management stopped work on all hoisting and rigging activities. These remain halted.
- Decontamination and Decommissioning activities at the Chemistry and Metallurgy Research Building increased early in the calendar year as the first glovebox removals commenced. Glovebox removals are not funded in fiscal year 2023 so current activities are limited to low-level waste removal.
- The transition of the Radioactive Laboratory Utility Office Building to a Hazard Category 3 nuclear facility to be known as PF-400 neared completion as Federal and Contractor Operational Readiness reviews occurred in May and February respectively.
- NNSA made the decision to restart the Waste Characterization, Reduction, and Repackaging Facility as a hazard category 3 nuclear facility to establish size reduction capabilities for oversized transuranic waste items. Safety basis development to support this transition also commenced this year.
- The team who will vent the Flanged Tritium Waste Containers stored at Area G performed a proficiency demonstration for federal assessors in the summer. Commencement of venting is awaiting permitting.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 6, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending January 6, 2023

Plutonium Facility–Infrastructure: Last month, Triad completed the annual revision of the TA-55 Project Execution Strategy (PES) (see 1/28/2022 report). The PES outlines the strategy, estimated cost ranges, general scope, high-level schedule, and potential funding sources to be used to complete a set of upgrades, modifications, and maintenance activities at the Plutonium Facility. For last fiscal year, the PES highlighted key accomplishments including: completion of the chlorine system upgrades which included a new chlorine gas delivery system and chlorine gas detection system; closure of several issues identified as part of the ongoing seismic evaluation efforts, such as duct seams, were resolved through calculation or further evaluation of code; and completion of seismic analyses for 38 gloveboxes.

For this fiscal year, the PES recommends actions including the completion of: a fire dynamic simulator model of a lab room fire across the corridor, in addition to a 2-hr test of a mock PF-4 corridor coated with intumescent fire barrier paint; construction and commissioning of the new facility control system (FCS); seismic testing of fire suppression system piping components; the design for the instrument air system upgrades; a prioritized schedule of gloveboxes to be analyzed in support of the seismic program and evaluations for six groups of them; and a prioritized list of fire hazard evaluations to be analyzed with seven to be completed.

Plutonium Facility–Operations: Beginning two weeks ago, facility personnel experienced multiple problems with the FCS. The FCS has a safety-significant function supporting the ventilation system and has other non-credited functions including monitoring radiation detection systems, monitoring fire systems, and interfacing with the paging system. Facility personnel repaired the first issue with the FCS by replacing a communications module. They resolved a second issue about a week later with a server swap and restart. Following a third incident, facility management kept the facility in limited operations mode and the FCS formally inoperable after the successful initial repair until more detailed troubleshooting and repairs could be completed. Those activities continued this week. The FCS is now operable, and the facility is in normal operations mode. The FCS is an aging system, and there is a current project in place to replace its safety-significant function. The existing system will remain largely in place to perform its other functions following completion of the new system. The new system is installed, and several outages to support swapping over to it are planned over the next few months.

Area G–Safety Basis: On Sunday, the Environmental Management Field Office conditionally approved the latest revision of the Area G basis for interim operations and unconditionally approved an addendum supporting corrugated metal pipe (CMP) size reduction. The approval documentation included one new condition of approval to include new calculations and standoff distances to support eventual Flanged Tritium Waste Container venting. Internal pressure of these containers steadily increases due to tritium decay, and the field office directed a similar evaluation last year. Two other conditions of approval remain from last year and are related to 1) helicopter crash standoff distances, and 2) the re-evaluation of the frequency of combined fixed wing aircraft and helicopter crashes with results incorporated into the modern documented safety analysis under development to replace the current basis for interim operations. Work is ongoing to close the remaining condition of approvals. A contractor readiness assessment to support startup of that activity is planned for later this month.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 13, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending January 13, 2023

Staff Activity: R. Eul was onsite to observe the assist visit from the Criticality Safety Support Group.

Criticality Safety: A six-member team from the Criticality Safety Support Group (CSSG) was onsite to perform an assist visit. The NNSA Field Office requested the CSSG review the nuclear criticality safety program as implemented at the Plutonium Facility to evaluate the program's ability to support the no less than 30 pit per year production mission. The tasking asked the review to include: looking at criticality safety limits at the plutonium facility to enhance operational flexibility; recovery from deviations and infractions; the roles, responsibilities, authorities, and accountability within the nuclear criticality safety program; and adjudication of differing technical opinions. The team split into three groups focusing on: the pit process flow and field observations; the development of criticality safety evaluation documents and controls; and line management support of nuclear criticality safety. The team briefed field office and Triad management on their initial observations at the end of the week and plan to develop recommendations and issue a final report by the end of March.

Plutonium Facility–Operations: On Monday, a grit paper disk auto-ignited while a worker was transferring it between gloveboxes. A small flame traveled along the path where the grinding surface had been in contact with plutonium and then self-extinguished. The involved worker paused the operation and contacted facility operations. Management subsequently paused all facility grinding, cutting, and polishing operations. A fact-finding meeting was held on Wednesday to discuss the event. Meeting personnel could not identify any change to the process which could cause a fire. However, plutonium fines have known pyrophoric properties. They noted that this is the first occurrence of a fire on a grinding disk in this frequent operation. Facility personnel are evaluating potential causes. Additionally, a breakdown in communication occurred as the fire department was not notified of the incident. Facility management is evaluating ways to ensure workers understand the importance of taking proper actions in response to fire including activating the dropbox fire alarm or pulling a manual pull station and calling 911.

On Monday, workers repackaging a legacy item for disposal observed a few seconds of 'sparking' while pouring material from a can into a tray. The reaction occurred in a glovebox and was limited to sparks with no visible flame. The workers paused and reported the incident. The material was a free-flowing powder of electrorefining salt and plutonium. The cause was likely luminous oxidation of plutonium metal powder in the air atmosphere of the glovebox; however, this was not expected given the age of the material and its packaging conditions. The material was originally processed under an inert atmosphere; however, it was not packaged under inert conditions. As a corrective action from the 2021 titanium event (see 5/14/2021 report), Triad developed procedures to address moving materials from inert to air boxes. In response to this event, personnel are developing a path forward for safely repackaging this material and are evaluating feed lists to determine if additional controls are needed for similar materials slated to be repackaged for disposal.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 20, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending January 20, 2023

Staff Activity: On Friday, a DNFSB headquarters team held a call with NNSA Field Office and DOE headquarters personnel to discuss the proposed methodology of coupling leak path factor and atmospheric dispersion. The proposed methodology will support the upcoming safety basis upgrade for the Plutonium Facility (see 11/4/2022 report).

Area G–Readiness: On Monday, a twelve-member contractor team commenced a readiness assessment to initiate Corrugated Metal Pipe (CMP) size reduction operations in Dome 375. Non-CMP size reduction operations were last performed at that location in May 2014, and nuclear operations other than the movement and storage of waste containers have not been performed in the dome since November 2017. Readiness for retrieval of CMPs was evaluated separately in May 2022 (see 05/20/2022 report).

The scope of this review includes winching the CMP along roller conveyors into cell 1 of the Dome 375 Perma-Con; winching the CMP along roller conveyors into cell 2, the main size reduction area; cutting one 4-ft section of the CMP with hydraulic shears; loading the 4-ft cut section into a standard waste box; and securing and moving the waste box to a staging area inside of Dome 375. This week, the team performed interviews with operations and support personnel. The review will continue next week with observations of an operational drill and field demonstrations.

Plutonium Facility–Decontamination and Decommissioning: Last Friday, workers preparing a glovebox line for removal prior to replacement identified an unexpected condition. When they moved a hand press in the box for size reduction, they discovered a deposit of unknown material that had accumulated under the press. Following consultation with a manager in the area, they paused work and made the appropriate notifications. There was no sparking or other evidence of a chemical reaction when the material was disturbed. The glovebox has not been used in decades and historical processes were under an inert atmosphere. The box currently has an air atmosphere. Prior to performing this activity, workers had removed all known nuclear material from the box, which was posted as containing no special nuclear material. The box remains out of service while facility personnel determine the nature of the material, whether it contains nuclear material, and how best to dispose of it as waste. Facility management is also evaluating adding additional contingencies to work documents to address conditions that are likely to occur during this type of work.

Weather Impacts: Snowfall impacted onsite operations at the laboratory resulting in a closure on Tuesday and a delayed start on Wednesday.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 27, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending January 27, 2023

Staff Activity: D. Brown was on site.

Area G–Readiness: The contractor team continued its readiness assessment of corrugated metal pipe (CMP) size reduction activities in Dome 375. This week, N3B personnel demonstrated the loading, cutting, and packaging of a mockup CMP under chilly weather conditions requiring warm-up breaks to avoid cold stress. The demonstration included an operational drill where workers had to respond to the discovery of a tear in the bag holding the CMP. One of the assessors identified a lockout/tagout issue during the demonstration. The cutting shear is locked out when workers are cleaning the contamination control shroud surrounding it. While the worker performing the hands-on activity had a lock in place, the interface between the CMP cutting procedure and lockout/tagout documentation had weaknesses such that all lockout/tagout requirements were not completed properly. Facility management is developing corrective actions to resolve this discrepancy and prevent recurrence. The assessment team briefed the preliminary results of their review on Thursday and plan to finalize their report in February.

Area G–Emergency Management: As part of the readiness assessment, N3B personnel held an emergency preparedness drill. The scenario involved a process upset during CMP size reduction activities where the winch began to smoke. Workers appropriately identified the hazard, simulated use of a manual fire extinguisher, evacuated the Permacon and Dome, then met at the assembly area for accountability. During the drill critique participants identified potential areas for improvement. One idea was to considering adding additional assembly areas within the Area G fenceline to reduce travel time from work areas.

Area G–Safety Basis: N3B held a workshop to support development of a modern DOE-STD-3009-2014 compliant safety basis for Area G. Participants worked on topics such as atmospheric dispersion modeling, controls development, and expectations for safety management programs.

Emergency Management: On Wednesday, Triad held an emergency preparedness drill at the Emergency Operations Center. The scenario was a wildfire initiated by downed powerlines in Los Alamos Canyon at the northern edge of the site. The simulated conditions had the event occurring during high winds in May. The fire behavior in the scenario was challenging as flame height was too high for safe direct attack, and wind speeds were too high to deploy aerial resources. The nearest hazardous facilities to the event were Technical Area 21 and the Los Alamos Neutron Science Center. The fire's location also posed a risk to two of the limited evacuation routes out of Los Alamos County. In both reality and the drill scenario, fuel loading in Los Alamos Canyon is high as previous wildfires have not significantly impacted it. There are plans to perform fuel mitigation in the canyon later this year.

A team from the Office of Emergency Management Assessments (EA-33) in DOE's Office of Enterprise Assessments was on site as part of their assessment of the all-hazards planning basis for transuranic waste operations at the laboratory. The team expects to complete their review and issue a report in May. This is part of a complexwide assessment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 3, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending February 3, 2023

Area G–Stop Work: Last week, N3B personnel were working to resume excavation of corrugated metal pipes, which has been paused since last September due to a heat stress incident (see 9/16/2022 report). A facility representative from the Environmental Management Field Office paused resumption of activities due to questions on training, ladder requirements, snow removal, and the excavation slope. N3B management later formally stopped work after determining that the existing slope of the excavation was steeper than the slope on the drawings. The stop work remains in place while N3B personnel evaluate whether the existing slope is adequate for the soil conditions.

Plutonium Facility–Criticality Safety: On Monday, facility workers discovered a non-compliance with the mass requirements from the criticality safety posting for a safe in a laboratory room. This was the same safe involved in a similar event last year (see 11/18/2022 report). The workers paused and reported the discovery. A material move the week before was not completed properly with all mass checks such that a second item placed into the storage location exceeded the mass limit. This was an analyzed upset condition, and criticality safety personnel determined the condition was safe and stable. Access to the area was restricted until personnel completed recovery actions to restore compliance with the mass limit. Processing of special nuclear material in this room is paused with the exception of runs in progress that were completed per procedure to a stable condition. Corrective actions from this event include: prioritizing an incomplete corrective action from the November event to match the accountability and criticality safety locations for the safe, performing an extent of condition evaluation to determine if there are other locations with similar error traps where the criticality safety location is defined differently than accountability locations, and adding this event into the formal causal analysis in progress related to previous events.

Plutonium Facility–Infrastructure: Facility personnel are working on completing the installation of the new Facility Control System (FCS) (see 1/6/2023 report). Two weeks ago, facility personnel cut over portions of the new system to uninterruptible power supply power distribution panels. A delay due to issues with wire tracing left the FCS out of service for longer than anticipated, which delayed restoration of the facility to normal operations mode following the weekend work. This weekend, there will be another FCS outage to perform similar work. Facility personnel have taken photographs of wiring to alleviate similar wire tracing confusion during the upcoming cutover. A two-week outage is planned for the end of March to support the transition to the new FCS.

Onsite Transportation: On Monday, Triad provided a revised response to the NNSA Field Office regarding proposed compensatory measures to increase the safety of onsite transportation of nuclear materials while DOE reevaluates its approach to developing transportation safety documents (see 12/16/2022 report). The new response commits to implement a series of compensatory measures for high material-at-risk (MAR) onsite transfers of transuranic waste within sixty days. The response also states that non high MAR transfers will use existing controls, and there will be no high MAR transfers that are not transuranic waste until the transportation safety document is updated. A key compensatory measure is that the limit for high MAR transfers is dropping to 8.8 kg plutonium-239 equivalent from 20 kg plutonium-239 equivalent.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 10, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussof and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending February 10, 2023

Plutonium Facility–Infrastructure: Last Friday evening, as part of the on-going Facility Control System upgrade, facility personnel were working on a de-energized panel adjacent to an energized panel that had been installed two weeks prior (see 2/3/2023 report). An electrical worker identified a missing bushing on the energized panel, which should have been installed two weeks prior, and performed an out-of-scope repair. A live lead met the panel wall causing two breakers to trip, the local 120V as well as one in a 480V panel further upstream. On Monday, facility personnel held a fact-finding meeting that identified several potential corrective actions including: formalizing the turnover process from swing shift to night shift, performing an extent of condition review on training among electricians as this worker had not yet completed the required core electrical safety training, using flagged or marked panels to denote their energy status, and assembling a learning team to discuss the absence of voltage checks. The system impacts from this event prevented restoration of the facility to normal operations until Thursday evening.

On Monday, the NNSA Field Office concurred on the Fiscal Year 2023 Technical Area 55 Project Execution Strategy (see 1/6/2023 report). This is the first time the Field Office formally concurred on the strategy that documents planned upgrades, modifications, and maintenance at the Plutonium Facility. The concurrence letter notes that a key change for 2023 is removal of line item funding to support a safety-class active confinement ventilation system from the TA-55 Reinvestment Project III. This is inconsistent with a previous NNSA decision that removed said funding in 2016 (see 11/25/2016 report). In a 2020 briefing to the Board, NNSA again stated that the end state of facility would involve a seismically qualified safety-class active confinement ventilation system (see Exhibit 16 from DNFSB Public Hearing 11/16/2022). In a letter dated 3/15/2022, NNSA communicated to the Board the revised strategy for the active confinement ventilation system and NNSA and LANL discussed this strategy during the Public Hearing on 11/16/2022.

Chemistry and Metallurgy Research Building (CMR): Last week, CMR workers recognized that they failed to execute a required surveillance in August 2022. The requirement is to test open faced hoods handling nuclear material for adequate air flow biannually. During the surveillance evolution last week, a worker noticed three hoods were omitted from the work documentation. Upon further investigation, the workers determined that the surveillance had been skipped in February 2022 due to the room having an access restriction, and the three hoods were not included in subsequent work documentation for August 2022. All three hoods were tested and passed minimum air flows last week. On Monday, a fact-finding meeting was held to discuss the incident. Meeting personnel identified several potential corrective actions including updating the procedure to include fixed data (e.g., hood numbers and dimensions), evaluating a method to improve the tracking of surveillances through completion, and performing an extent of condition review to flag other surveillances that rely on previous paperwork to baseline current needs.

Area G–Stop Work: On Wednesday, N3B released the stop work on excavation of corrugated metal pipes (CMPs), and shortly thereafter, the Environmental Management Field Office released their pause (see 2/10/2023 report). N3B personnel completed and explained conducting a series of new soil penetrometer tests intended to justify that the existing slope of the excavation is acceptable for the soil characteristics. CMP retrieval has not yet resumed as personnel continue to validate that all training, maintenance, and other requirements are in place and documented.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 17, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending February 17, 2023

Board Activity: On Friday, the resident inspectors and staff member D. Bullen joined Vice Chair T. Summers on a tour of the Trinity Site with Sandia Field Office personnel, hosted by the Defense Threat Reduction Agency.

Staff Activity: M. Sautman was on site to evaluate resident inspector performance. R. Jackson and Y. Li attended a workshop in Los Alamos on the Plutonium Facility Seismic Performance Reassessment Project.

Plutonium Facility–Criticality Safety: Triad personnel identified two unanalyzed criticality safety scenarios for the vault in the Plutonium Facility. First, a new technical basis suggests that the previous 4” flooding depth due to fire sprinkler actuation in the vault is not defensible and new, higher numbers are more appropriate. The impact of this greater depth of moderator is under evaluation. The second scenario involves repackaging operations and the potential for open containers to fill with water if sprinklers actuate. While criticality safety personnel evaluate these scenarios, vault operations are limited. No overpacking or placement of containers on the floor is currently allowed.

Los Alamos Neutron Science Center (LANSCE)–Emergency Response: On Monday, a fire broke out in a non-radiological LANSCE building. An employee smelled smoke coming from a room where an ultrasonic cleaner, which heats and agitates ethanol, was being used. The employee extinguished the fire, called the emergency operations support center and 911, but did not activate the fire alarm pull station. The Los Alamos Fire Department responded to the scene, performed smoke venting, and released the facility soon thereafter. The following afternoon, facility personnel held a fact-finding meeting to discuss the incident. Meeting participants noted that the equipment had been left unattended and there was poor housekeeping in the area, which contributed to the fire spreading several feet across the lab table. The worker’s account was that 2-to-3-foot flames were present when they used the portable fire extinguisher. Facility management initiated a housekeeping pause in response to this event.

Readiness: Triad personnel started a self-assessment of their readiness to harvest containers containing high quantities of heat source plutonium that will exceed normal material at risk limits (see 4/1, 7/8/2022 reports). The assessment will continue next week, and concurrent contractor and federal readiness assessments will take place prior to startup.

A contractor team commenced their readiness assessment for plutonium coupon studies at the Weapons Engineering Tritium Facility. The review will continue into next week, and a federal readiness assessment will follow.

Transuranic Waste Facility (TWF)–Safety Basis: The NNSA Field Office transmitted a letter to Triad stating that the revision to the TWF safety basis is not approved, and that a new revision addressing field office comments should be provided (see 12/23/2022 report). Of note, the field office provided mandatory comments on the lengthy new completion times for limiting condition of operation actions.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 24, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending February 24, 2023

Staff Activity: D. Brown, M. Dunlevy, and P. Migliorini were on site to start their review of the enhanced chemical compatibility evaluation process for transuranic waste (see 7/8/2022 report). The team went to the analytical chemistry laboratory and the aqueous chloride room in the Plutonium Facility to better understand those processes in terms of the chemicals used and transuranic waste generated from them. D. Brown also observed Central Characterization Project activities on site.

Plutonium Facility–Readiness: A management self-assessment (MSA) team completed its review to assess the readiness to perform the upcoming campaign to process large quantities of heat-source plutonium (see 2/17/2023 report). On Thursday, the team briefed NNSA Field Office and Triad personnel on their initial results, which included five pre-start findings, two post-start findings, and four noteworthy practices. Pre-start findings included revising procedures, further analyzing hazards to ensure controls are integrated into the procedures, and adding specificity to the startup plan as called for by DOE Standard 3006, *Planning and Conducting Readiness Reviews*. The MSA team stated that the activity is ready to move to the contractor readiness assessment once the pre-start findings are completed. A federal readiness assessment will be completed concurrent with the contractor readiness assessment.

PF-400: Earlier this month, the NNSA Field Office authorized PF-400, the facility formerly known as the Radiological Laboratory Utility Office Building, to operate as a hazard category 3 nuclear facility. An independent review team from the local and Sandia NNSA Field Offices reviewed all pre-start corrective actions and concluded they had been satisfactorily completed. Initial operations will take place under an approved startup plan.

Environmental Management–Contractor Assurance: On Thursday, the Environmental Management Field Office issued the final report for a combined assessment of N3B’s contractor assurance system and the Field Office’s oversight activities. The assessment report lists fourteen opportunities for improvement leading to seventeen recommendations to improve processes. Recommendations included: better balancing of federal oversight activities between emerging issues and routine activities; improve risk-based oversight and refine metrics to better inform risk using guidance from the Energy Facility Contractors Group, other DOE sites, or industry best practices; and, provide effective tools to federal staff to consolidate the results of oversight efforts into defensible feedback to the contractor.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 3, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending March 3, 2023

Weapons Engineering Tritium Facility (WETF)–Readiness: The contractor readiness assessment team evaluating plutonium coupon study operations completed its review and briefed its initial results to facility management on Monday (see 2/17/2023 report). The team presented six pre-start findings. These included two related to emergency preparedness that identified issues with the operational drill program as well as with abnormal operating and alarm response procedures. A federal readiness assessment is planned prior to introducing plutonium to WETF.

Plutonium Facility–Transuranic Waste Management: Last month, transuranic waste management personnel identified that, in December, workers added absorbent to a waste drum without acceptable knowledge personnel present as required by the procedure for characterization and absorption of liquids. The drum went through the visual inspection and visual examination processes in January. Acceptable knowledge specialists discovered the error when they noticed they were missing data on the amount of absorbent added to the drum. Personnel involved in the event have several corrective actions planned to prevent recurrence and ensure drums are prepared properly for disposal at the Waste Isolation Pilot Plant (WIPP). These include assuring drums meets all WIPP Waste Acceptance Criteria, performing a major rewrite of the procedure for absorbing liquids including adding training and placekeeping requirements, and conducting training for both operations personnel and acceptable knowledge personnel.

Plutonium Facility–Criticality Safety: Vault activities are still impacted by the recently identified criticality safety concerns (see 2/17/2023 report). Three operational restrictions were eased this week. First, overpacking of non-fissionable materials is now allowed on the floor or on a transport cart. Second, overpacking of low mass fissionable containers and oxides are now authorized on a transport cart. Third, non-standard containers containing no fissionable material may be placed on the floor to support operations. All other restrictions on container placement remain in place.

Conduct of Operations: The Associate Laboratory Directorate for Weapons Production issued a new procedure for conducting fact-finding meetings to supplement the laboratory-wide institutional procedures on performance improvement and issues management. The new procedure includes a recommended timeline for holding fact-finding meetings more expeditiously after events.

Federal Oversight: On Tuesday, an NNSA Facility Representative for the Plutonium Facility completed final qualifications following a walkdown of the facility with the NNSA Field Office Manager. This brings the number of fully qualified Facility Representatives assigned full-time to the Plutonium Facility up to two. The Field Office has a large class of facility representative candidates in training who will be assigned to facilities as their training progresses.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 10, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending March 10, 2023

Staff Activity: W. Dumayas and R. Jackson were onsite as part of their review of the seismic testing of the fire suppression system (FSS) at the Plutonium Facility. The team met with facility management and engineering personnel to discuss test results and plans for future testing in Reno, Nevada, to characterize the performance of FSS cast iron fittings under simulated seismic loads (see 12/2/2022 report). The DNFSB headquarters staffers did two entries into the Plutonium Facility. First, a familiarization tour led by the resident inspectors that also included three NNSA fire protection personnel from the field office and the Chief of Defense Nuclear Safety's assessment team. The second entry was supported by Triad engineering personnel to walk down key aspects of the FSS including the pumphouses, risers, and piping with seismic support upgrades.

Plutonium Facility–Legacy Items: Last week, workers attempted to address a safe in a laboratory room with ongoing decontamination and decommissioning activities. Facility personnel were unable to identify the origin or organization responsible for the safe. Based on available information, they believed the safe was used for document storage only and executed the plan to drill open the safe to verify the nature of any contents. Upon opening the safe, workers discovered seven shielded material handling containers of questionable provenance, two of which were open and empty, and five closed. Additional personnel were called in to help determine the origin of these containers, including radiological control technicians, who surveyed them and did not detect any radioactivity beyond background from the shielded containers. Later, due to the uncertainty of the contents of the containers, facility personnel declared a potential process deviation and restricted access to the room. The fact-finding meeting for this event, held on Monday, was the first under the new process for Weapons Production facilities (see 3/3/2023 report).

Area G: N3B personnel resumed retrieval of corrugated metal pipes (CMP), which have not taken place since the heat stress incident last September (see 9/16/2022 report). A previous attempt to resume retrieval resulted in a stop work to address concerns from the Environmental Management field office, which have since been resolved (see 2/3, 2/10/2023). Last Wednesday, the team excavated one CMP from the burial pit. This Wednesday, they transported it to a staging pad where the CMPs will remain until size reduction activities are authorized. The work crew performed a post job review to evaluate potential improvements and plan to continue excavations next week.

Onsite Transportation: On Wednesday, the NNSA Field Office concurred with Triad's plan to update the Transportation Safety Document by June 2023 and implement compensatory measures until the update is complete and any new controls are implemented (see 2/3/2023 report).

Federal Oversight: A team led by NNSA's Chief of Defense Nuclear Safety was onsite this week as part of their 2023 review of the NNSA Los Alamos Field Office.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 17, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending March 17, 2023

Plutonium Facility–Infrastructure: On Monday night, the cool down spray for a HEPA filter housing actuated. The operations center reported receiving a signal from a high temperature detector in the housing at the time of the cooldown spray system actuation. The Los Alamos Fire Department (LAFD) received notification via a water flow alarm. LAFD responded, cleared the basement, and found no evidence of a fire. LAFD reported four feet of water in the first stage of the housing, with no evidence of water leaking from under the access doors. Water eventually spread across the entire housing, settling to approximately 1.5 feet deep (estimated 4,700 gallons of water). Additionally, a substantial area of the basement was flooded with a few hundred gallons of water from overflow of the retard chamber on the fire riser supplying the housing. Initial attempts to isolate the release were delayed due to issues identifying local isolation valves and poor seating of a valve at the riser. The release was eventually stopped by closing the outdoor post indicator valve supplying the plenum cool down spray system. The cause of this system activation is still under investigation.

Basement floor water sampling revealed no contamination and cleanup is underway. Recovery efforts will include water sampling, draining, and processing through the Radioactive Liquid Waste Treatment Facility, and finally replacement and testing of new HEPA filters. The recovery timeline for this incident is expected to be on the order of weeks.

There was a similar inadvertent actuation of the deluge system protecting the PF-400 ventilation system in 2019 (see 6/14/2019 report). In 2021, the NNSA Field Office approved an equivalency to disconnect this system based on the results of a computational fluid dynamics simulation which is intended to demonstrate that the dilution of air during a fire is sufficient to keep filter temperatures below requirements in lieu of water for cooling (see 11/5/2021 report). Triad is considering requesting a similar equivalency to disconnect these systems for the Plutonium Facility (see Board letter 12/6/2022).

N3B–Area G Stop Work: Last Friday evening, following questions from the Environmental Management Field Office, N3B personnel paused work on the recently resumed excavation of Corrugated Metal Pipes (see 3/10/2023 report). On Saturday morning, N3B senior management elevated the pause to a stop work. The reason they stopped work was to verify compliance of the excavation with all applicable engineering standards and Occupational Safety and Health Administration requirements invoked by 10 CFR 851, *Worker Safety and Health Program*. There is currently no entry allowed into the excavation area.

Plutonium Facility–Readiness: Last week, a contractor team commenced the readiness assessment for restart of the Aqueous Nitrate Process at the Plutonium Facility. This is the last major process that has not resumed operations following the 2013 Director’s Pause. A limited operation of the cement fixation process, which is one of the aqueous nitrate operations, did take place in 2018 (see 9/14/2018 report). The above flooding event has impacted the ability for personnel to perform cold demonstrations for the assessment team and the readiness review is being extended to allow for review of the full suite of activities. Demonstrations are tentatively rescheduled for April 2023.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 24, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending March 24, 2023

Staff Activity: A. Kline, one of the Board's resident inspectors at the Savannah River Site, was on site to benchmark oversight approaches. M. Bradisse and R. Eul were on site providing additional support.

Plutonium Facility–Infrastructure: Facility personnel continued recovery efforts from the HEPA filter cool down spray actuation last week (see 3/17/2023 report). HEPA filter housing water sampling revealed no contamination, so the plan remains to drain remaining liquid and process it through the Radioactive Liquid Waste Treatment Facility. Triad entered the New Information process to determine any safety basis implications of this event. Access to the impacted wing of the facility is controlled by a standing order issued on Monday. The standing order specifies respiratory protection for entry into laboratory rooms and a room monitor with a radio stationed outside to communicate any changes in ventilation status between entry groups and Operations Center personnel.

Chemistry and Metallurgy Research Building (CMR): On Thursday, Triad submitted a revised temporary safety basis modification for CMR to support the third phase of activities to disposition americium bearing material from an offsite location (see 12/14/2018 report). These materials have been repackaged and characterized via gas sampling, imaging, and nondestructive assay. The next step is to unpack the inner containers for processing and final disposition of the material. Based on the characterization results, personnel determined there are no additional hazards beyond the radioactive material contained in inner containers. Therefore, the revised temporary modification proposes removing previous temporary controls and completing phase three activities under the controls currently established in the existing safety basis. The new temporary mod will be closed as soon as it is approved.

Federal Oversight: The staff and resident inspectors met with Environmental Management Field Office (EM-LA) personnel to discuss improvements in their oversight processes since the Board's August 17, 2022 letter communicating the results of a complexwide review of DOE safety oversight effectiveness. Since the data collection supporting that letter, EM-LA has hired additional federal and technical assistance contractor personnel into needed positions, revised a substantial fraction of their command media, and increased their level of oversight activities. EM-LA management is working to inculcate a culture of oversight into their staff and ensure that everyone recognizes their oversight responsibilities and is effective in their activities.

Area G–Safety Basis: N3B held another workshop to support development of a modern DOE-STD-3009-2014 compliant safety basis for Area G (see 1/27/2023 report). A resident inspector and staff members accompanied one of the workshop attendees from the DOE Chief of Nuclear Safety's Office and an EM-LA staff member on a visit to Area G. The primary purpose of the visit was to observe the implementation of controls in Dome 33 that support safe storage of potentially reactive drums and high fissile gram equivalent drums.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 31, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending March 31, 2023

Staff Activity: M. Bradisse, R. Eul, and B. Weathers were on site to review Triad's nuclear criticality safety program.

Chemistry and Metallurgy Research Building (CMR): This Wednesday, CMR personnel recognized that they failed to enter the appropriate limiting condition for operations (LCO) after they identified a degraded fire suppression sprinkler head during an annual surveillance of the safety-significant system the day before. The worker performing the surveillance notified operations and engineering personnel; however, the appropriate LCO was not entered, and this information did not go through the operability determination process until the following day. On Thursday, a fact-finding was held to discuss the incident. Meeting personnel identified several potential corrective actions including reviewing the associated work documents to ensure clarity and alignment with the facility technical safety requirements (TSRs), implementing more rigor in use-every-time procedures, and reviewing deficiencies identified during TSR surveillances daily.

Plutonium Facility–Infrastructure: Facility personnel continued recovery efforts from the HEPA filter cool down spray actuation (see 3/17/2023 report). Last Friday, workers began siphoning water from the flooded HEPA filter housing into one of the basement sumps. The following day, they added pumps to help speed up the process. Shortly thereafter, workers noticed that an adjoining sump began to overflow and paused work. Water sampling revealed contamination around the overflowed sump. On Monday, workers pumped down the overflowed sump and discovered a broken float. A recovery plan was implemented to clean and decontaminate the area which began Tuesday and continued through the week. On Wednesday, the HEPA filter housing draining activities resumed at a reduced flow rate and with additional personnel monitoring sump conditions: one stationed at receiving sump, one at the overflowed sump, and another on a rotational basis for the remaining facility sumps. Next week, facility personnel plan to commence HEPA filter replacement activities. Access to the impacted wing of the facility remains controlled by a standing order which specifies entry requirements (see 3/24/2023 report).

Plutonium Facility–Operations: Last week, Triad personnel performed a shot using the Isotope Fuels Impact Tester. During post-shot activities, the workers discovered contamination indicating a potential fuel clad breach. They followed the contingencies in their procedures and returned the equipment to a safe configuration. There was no detectable personnel contamination or any evidence of an uptake. Recovery activities to determine the condition of the fuel clad and restore the system are being planned under the standing order for infrequent or unusual work activities.

Federal Oversight: The NNSA Field Office held a qualifying oral board in criticality safety for a staff member. The candidate performed well. The Field Office brought in two federal criticality safety experts from other NNSA organizations to be members of the evaluation board. The Field Office currently has two personnel assigned to criticality safety oversight. The other individual completed their oral board in early February.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 7, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending April 7, 2023

Staff Activity: A headquarters staff team participated in a teleconference with DOE and N3B personnel to discuss the development of the atmospheric dispersion protocol planned for use with the new DOE Standard 3009-2014 compliant documented safety analysis under development for Area G.

Chemistry and Metallurgy Research Building (CMR): This Tuesday, CMR personnel held a fact-finding meeting to discuss an incident where a worker entered a restricted area without authorization or the proper personal protective equipment (PPE). The worker entered a filter tower to perform work and, upon realizing others in the area had different PPE, notified a radiological control technician in the area. The technician checked the worker for contamination and allowed them to leave the area. During the meeting, the worker noted they entered the area through a door from the attic, that the rope restriction was not installed across the entire entryway, and that they misunderstood the access restrictions in place. Radiological control personnel countered that the intent of the rope-style barrier should have been evident, the area was “red lit,” and appropriate postings were in place. Meeting personnel identified several potential corrective actions to prevent recurrence, including designating entrances from the attic to filter towers as non-normal entryways, evaluating radiological control barrier practices, and holding a lessons learned meeting for all CMR residents.

Plutonium Facility–Emergency Management: Facility personnel held a discussion-based emergency preparedness drill for the Plutonium Facility. The scenario was a chlorine leak inside of a laboratory room involving the chlorine system that was upgraded last year (see 11/11/2022 report).

Plutonium Facility–Infrastructure: Facility personnel continued recovery efforts from the HEPA filter cool down spray actuation (see 3/17/2023 report). This week, workers completed the installation of new HEPA filters across the affected housing. On Thursday evening, the photometer used for efficiency testing of the filters failed and no calibrated spares were readily available at the Plutonium Facility. On Friday, filter testing was completed using a calibrated photometer from CMR. Facility personnel are working directly with the photometer manufacturer to ensure additional calibrated spares are available. Next week, facility personnel plan to finalize HEPA filter testing and lift the standing order controlling access to the impacted wing of the facility (see 3/24/2023 report).

Area G–Readiness: A federal team performed a readiness assessment for size reduction of corrugated metal pipes. The team identified 9 pre-start findings, 4 post-start findings, and 11 deficiencies. Notable findings included open deficiencies in the fire hazard analysis pertaining to a new diesel fuel tank, the flow-down of operating requirements into procedures, and missing calibration for a pressure gauge on the hydraulic shear.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 14, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending April 14, 2023

Staff Activity: On Tuesday, a headquarters staff team held a call with Triad and NNSA Field Office personnel to continue interactions supporting their review of the enhanced chemical compatibility evaluation process for transuranic waste (see 2/24/2023 report). On Thursday, a different headquarters team held a call with Triad and NNSA Field Office personnel to start a review of glovebox glove integrity processes. And, on Friday, a third staff team held a remote interaction with Triad and NNSA Field Office personnel as part of a review of decontamination and decommissioning activities at the Plutonium Facility (see 12/9/2022 report).

Criticality Safety: On Wednesday, the NNSA Field Office formally transmitted to Triad the final report from the Criticality Safety Support Group's (CSSG) assist visit in January (see 1/13/2023 report). The letter acknowledges that Triad has already been acting on the CSSG's recommendations. Consequently, the letter requests that Triad formally transmit documentation from its issues management system regarding the status of those actions. Major changes already in progress include a reorganization of the Nuclear Criticality Safety division, which includes new leadership, a structure intended to better align with programmatic needs, and more senior technical positions including a chief engineer.

Plutonium Facility–Glovebox Safety: There have been three glovebox glove breaches in the past few weeks. In all cases, there was no skin contamination or evidence of an uptake, and the involved workers discovered the breaches immediately following contamination surveys upon exiting glovebox gloves. This week, facility personnel held a fact-finding meeting to discuss these breaches, evaluate whether there were any commonalities between the events, and develop actions to prevent recurrence. One event involved repetitive motion using a hand pump. Workers believed that caused undue wear on the glove, and efforts are in progress to replace the manual operation with an automated system. This is a relatively new activity, so personnel are also evaluating appropriate glove replacement timing as more data is gathered. Another event involved vigorous wire brushing of a part which is an infrequent activity. Evaluation of increased overglove usage and reinforcement of using tabs when taping items are potential corrective actions related to that breach.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF): On Thursday, the NNSA Field Office unconditionally approved the latest Safety Design Strategy (SDS) for restarting WCRRF as a hazard category 3 nuclear facility. This revision addressed NNSA's directed changes from the previous version (see 12/23/2022 report). WCRRF was last operated as a hazard category 2 nuclear facility and will be restarted to support decontamination and size reduction of large items such as gloveboxes. The SDS proposes a strategy relying largely on limits on material at risk and does not expect credited engineered controls will be necessary. While efforts to develop a new safety basis for restart are in progress, the facility remains in cold standby under its existing hazard category 2 safety basis, which is an antiquated Basis for Interim Operations with an addendum to support addressing a drum of unknown contents currently in the WCRRF Glovebox Enclosure.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 21, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending April 21, 2023

Staff Activity: M. Bradisse was on site to observe the resumption of the contractor readiness assessment for restart of the Aqueous Nitrate Process at the Plutonium Facility. Field demonstrations for this assessment were rescheduled following the flooding event in the basement of the facility (see 3/17/2023 report). Facility personnel completed replacement of HEPA filters and restoration of ventilation in the impacted wing prior to the start of last week.

Plutonium Facility–Criticality Safety: Triad personnel identified a disconnect between criticality safety documentation and the safety basis regarding seismic qualification of nuclear material safes. A subset of safes in the facility are credited to remain upright during seismic events to prevent formation of a critical geometry. Safes required to perform this function are first identified in criticality safety analyses and then designated in the safety basis as a safety-significant control through a process defined in the site’s Criticality Safety Program. Triad personnel recently identified deficiencies in the documentation for one of the safes, and a subsequent extent of condition review in progress has identified several other safes with documentation issues. Triad personnel are working to ensure that all safes credited with this safety function have been identified and documented appropriately.

Plutonium Facility–Glovebox Safety: There were two glovebox glove breaches this week. Neither resulted in skin contamination or indication of any uptake. Workers identified one following a radiological survey performed immediately upon exiting the glovebox gloves, and the other was discovered following radiological monitoring at the laboratory room exit. Facility management is including further evaluation of these events into the ongoing evaluation of three other recent glovebox glove breaches (see 4/14/2023 report).

Area G–Safety Basis: On Tuesday, N3B transmitted their site-specific atmospheric dispersion protocol to the Environmental Management Field Office for approval (see 4/7/2023, 6/17/2022 reports). Key approaches used in this protocol include: use of the default χ/Q dispersion parameter for co-located worker consequences; use of plume buoyancy effects for some fire accident scenarios; and use of time-based plume meander correction for longer release durations. The Board’s staff plans to review how this new protocol will be used to establish dose consequences in the new safety basis under development for Area G.

PF-400–Electrical Safety: Last Thursday, electricians contacted an energized switch while torquing electrical components for equipment installation in PF-400. While no one was injured, the workers observed sparks. The work documentation for this task had recently been revised and no longer included a lockout/tagout for this scope of work. One of the immediate corrective actions from the event was to reinforce the need to perform zero energy checks by having a superintendent or higher observing the check. This requirement has also been put in place at the Plutonium Facility. Other corrective actions include a review of other electrical jobs in progress and an evaluation of work planning processes for revision of construction work packages.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 28, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending April 28, 2023

DNFSB Staff Activity: The Resident Inspectors were in Washington, D.C. to brief the Board and attend meetings. This report is filed for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 5, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending May 5, 2023

Staff Activity: On Tuesday, a staff review team held a remote interaction with Triad and NNSA Field Office personnel supporting their continuing review of Triad's nuclear criticality safety program (see 3/31/2023 report).

Plutonium Facility–Readiness: Last week, a contractor team completed the readiness assessment for restart of the Aqueous Nitrate Process at the Plutonium Facility (see 4/21/2023 report). The team briefed NNSA Field Office and Triad personnel on their initial results, which included five pre-start findings and three post-start findings. One finding involved issues with procedures that cannot be performed as written, inadequate procedure validation, and inadequate subject matter expert review of procedures. Other findings included issues with operations records management, inadequate linkage of criticality safety parameters with the master equipment list, and an ineffectively closed pre-start finding previously identified during the management self-assessment.

Plutonium Facility–Safety Basis: Triad transmitted to the NNSA Field Office, for information, a major re-baseline of the project execution plan for upgrading the Plutonium Facility's safety basis to meet DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis* (see 7/22/2022, 7/19/2019 reports). The new plan now expects submittal of a completed safety basis to the field office for approval in the first quarter of fiscal year 2024. Triad also recently submitted to the NNSA Field Office, for concurrence, a revision to their methodology for calculating leak path factor and atmospheric dispersion. This methodology will support mitigated accident analysis in the safety basis under development.

Plutonium Facility–Emergency Response: On Tuesday, glovebox workers noticed sparking and a small fire while they were moving materials into a bag within a glovebox. The fire self-extinguished. Personnel in the room evacuated, made appropriate notifications, and the fire department responded. They found no evidence of continued thermal activity. As the response to this event was largely successful, facility personnel plan to issue a lessons learned to share this proper response to a fire. One corrective action from the event is to evaluate the positioning of dropbox manual fire alarm initiating devices as some are located too high for all employees to readily reach.

Plutonium Facility–Electrical Safety: Facility workers identified that wiring in the system that performs electrolytic decontamination of plutonium containers was degrading rapidly. The insulation was cracked, consistent with thermal damage. The system has been having issues with electrical components for several months and has undergone several component replacements including a power supply. These changes were not reviewed by electrical safety officers. Last month, when management became aware of the degradation, they paused the operation and requested a walkdown by electrical safety officers. The system is currently out of service while personnel work to identify the cause of the wire degradation and conduct repairs.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 12, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending May 12, 2023

Staff Activity: N. Huntington and E. Tetteh were on site to attend a training course on DOE-STD-5506, *Preparation of Safety Basis Documents for Transuranic Waste Facilities*, sponsored by the DOE Office of Environmental Management. A. Boussouf was at the Pantex Plant providing resident inspector coverage. Y. Li attended a meeting in Walnut Creek, CA regarding the update to the Los Alamos Probabilistic Seismic Hazard Analysis.

Area G–Emergency Response: On Monday, workers in Area G smelled a solvent-like odor in Dome 230 and later reported symptoms. Area G personnel entered their emergency response procedure, and the Los Alamos Fire Department and Triad Emergency Management personnel responded. Other than an initial miscommunication on dose rates, responders detected no abnormal chemical or radiological activity. Later in the week, N3B personnel developed a recovery plan to reenter Dome 230 and confirm that there was no evidence of a breached transuranic waste drum or other hazards. The plan included a slow entry while monitoring for chemical and radiological conditions. It included surveys of potentially reactive drums, designated locations in the dome, and a selection of other drums. They performed an initial dome entry on Thursday afternoon and found no abnormal chemical radiological readings. The dome is still restricted while more samples are being collected and analyzed.

Plutonium Facility–Criticality Safety: In April, Triad nuclear criticality safety personnel issued a revised technical basis for credible water accumulation in the vault due to fire sprinkler activation (see 2/17/2023, 3/3/2023 reports). The new calculations have a maximum flooding depth of 5.7’; the previous revision had 4’. Last week, Triad personnel suspended vault activities. Vault activities were already limited due to the previous revision of the water accumulation technical basis, and Triad personnel are evaluating whether current operational restrictions are adequate for the new flooding depth. Triad has been developing a process to address unknowns in nuclear criticality safety space similar to the unreviewed safety question process used for safety basis. This process is still under development, and this latest question regarding water depth in the vault was used as a pilot activity to support finalizing the process.

Plutonium Facility–Infrastructure: Last Friday, the Plutonium Facility entered standby mode, which curtails allowable work activities, to support two planned safety system upgrade activities. One is the cutover to the new Facility Control System. This process requires periodic securing of ventilation fans. The second upgrade activity involves the south fire riser, which will put part of the fire suppression system out of service.

Triad transmitted to the NNSA Field Office for formal review, the draft preliminary documented safety analysis (PDSA) for the Los Alamos Pit Production Project 30 reliable mission. The PDSA is based on the 30% design review and evaluates changes associated with the 30 reliable mission.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 19, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending May 19, 2023

Staff Activity: C. Beaty, M. Bradisse, and D. Bullen were on site to continue interactions with Triad and NNSA Field Office personnel supporting a staff review of Decontamination and Decommissioning (D&D) efforts at the Plutonium Facility and at the Chemistry and Metallurgy Research Building (CMR).

Plutonium Facility–Safety Basis: Triad submitted a temporary safety basis modification for the Plutonium Facility to the NNSA Field Office for approval. The temporary modification supports continued operation of specified gloveboxes during D&D activities. Removing gloveboxes can change the seismic performance of interconnected gloveboxes to below their requirements until new gloveboxes are installed. The temporary modification proposes identifying gloveboxes whose seismic performance will be degraded and treating them like existing gloveboxes that do not meet required seismic performance. There are no new proposed controls; the temporary modification instead identifies the existing compensatory measure of the seismic power shutdown system. Any of these gloveboxes that have criticality safety evaluations that rely on seismic performance to maintain geometry control will have to revise those evaluations.

Plutonium Facility–D&D: Last month, personnel performing a walkdown to support additional holdup measurements in a laboratory room undergoing D&D activities discovered four unlabeled metal containers in an out-of-service glovebox. An extent of condition review discovered several other containers of uncertain provenance in other gloveboxes in the room. Existing holdup measurements suggest that none of these containers contain significant quantities of nuclear material. Facility personnel plan to ensure a criticality safety evaluation is in place, change glovebox gloves, and perform other safety reviews before they can inspect and remove these containers. Meanwhile, personnel are continuing to develop processes for responding to the discovery of unexpected materials during D&D activities (see 1/20/2023 report).

Plutonium Facility–Infrastructure: The Plutonium Facility remains in standby mode to support upgrade activities (see 5/12/2023 report). The outage is expected to end at the beginning of the next work week when the facility will return to operations mode. Further testing of the new facility control system will be completed in standby mode over the next several weekends. As the new system is functional, but not fully operable per the definitions in the safety basis, the facility will enter operations mode under the conditions of the temporary modification to the safety basis that allows additional flexibility during commissioning of the new system (see 10/28/2022 report).

Chemistry and Metallurgy Research Building–D&D: Last month, the D&D subcontractor at CMR performing low-level waste removal completed their activities. Higher hazard D&D activities at CMR such as glovebox removals are still paused and are awaiting more characterization data. The current path forward is to develop a sampling and analysis plan to characterize gloveboxes in fiscal year 2024 which should support resumption of glovebox removals in fiscal year 2025 (see 12/9/2022 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 26, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussof and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending May 26, 2023

Staff Activity: On Monday, a headquarters team held a second remote interaction with Triad and NNSA Field Office personnel to continue the staff's review of glovebox glove integrity (see 4/14/2023 report).

Emergency Management: On Tuesday, the resident inspectors accompanied NNSA Field Office, Triad, and Los Alamos Fire Department personnel on a tour of the Los Alamos Medical Center Hospital decontamination unit and discussed their capabilities to receive and treat radiologically contaminated individuals.

Area G–Operations: Last Thursday, N3B personnel partially restored access to Dome 230, which was restricted following the emergency response event two weeks ago (see 5/11/2023 report). Continued radiological and chemical sampling activities following the event identified no unusual readings. Access to the dome is currently controlled with a daily shift order providing interim entry requirements while additional evaluations are performed. The shift order requires that industrial hygiene personnel survey Dome 230 to assess facility conditions at least once a day when work activities will be performed in the dome. It also requires that any workers entering the dome be accompanied by a qualified individual with industrial hygiene monitoring equipment. With access to Dome 230 partially restored, N3B personnel were able to complete moving all remaining waste containers identified as having the potential for energetic chemical reactions to Dome 33 (see 11/26/2021 report).

Last week N3B management released the stop work on excavation of corrugated metal pipes (CMPs) (see 3/17/2023). This week they completed excavation of one CMP and moved it to the staging pad for future size reduction. Closure of corrective actions from the federal readiness assessment for CMP size reduction operations are nearing completion, and facility personnel plan to commence size reduction this summer (see 4/7/2023).

Plutonium Facility–Safety Basis: The NNSA Field Office concurred on the revised Project Execution Plan for upgrading the Plutonium Facility's safety basis (see 5/5/2023 report).

Plutonium Facility–Infrastructure: The Plutonium Facility remained in limited operations mode this week (see 5/19/2023 report). Personnel completed the planned connection efforts for the new facility control system; however, fire riser work is still in progress.

Chemistry and Metallurgy Research Building–Safety Basis: The NNSA Field Office responded to Triad's submittal of the self-terminating temporary safety basis modification supporting the third phase of disposition activities for americium bearing material from offsite (see 3/24/2023 report). The Field Office did not approve the submittal and requested that Triad either update the existing safety basis or update the temporary modification to provide sufficient justification that the hazards associated with the activities are verified not to exist or can be remediated.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 2, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending June 2, 2023

Emergency Management: On Wednesday, the resident inspectors attended the annual wildland fire and forest management meeting with NNSA Field Office, Environmental Management Field Office, Triad, Los Alamos Fire Department, National Park Service, and U.S. Forest Service personnel. Due to higher than average moisture, the current wildland fire danger rating for the laboratory is low. The meeting concluded with a tour of a recently mitigated area showing current fuel reduction strategies, and a display of available wildland firefighting equipment, including a masticator, a brush truck, and a new lightweight water tender more capable of navigating fire access roads.

Plutonium Facility–Infrastructure: Triad submitted an update to the Safety Design Strategy for the Los Alamos Plutonium Pit Production Project (LAP4) to the NNSA field offices for approval. The document was revised to clarify the project’s approach to meeting glovebox line seismic performance criteria. This approach allows the release of glovebox enclosure installation packages without performing seismic cluster analyses across interconnected gloveboxes and instead completing them at a later date (see 5/19/2023 report).

The Plutonium Facility returned to normal operations mode following a three-week outage (see 5/26/2023 report). Personnel completed planned activities associated with three system upgrades to improve reliability: cutover to the new safety-significant facility control system; upgrades to the south fire riser, which is part of a safety-class system; and controller upgrades for the crosstown trolley, a non-safety system that is critical for efficiently moving materials within the facility. The facility control system and trolley work was completed without significant issues during the planned outage timeframe. The fire riser upgrade was a more challenging effort and took longer than expected, extending the outage. One key problem was successfully installing anchorages for fire water piping. There was also a lockout/tagout issue during fire riser work. Facility management held a hotwash this week to develop lessons learned to improve planning for and performance of future outages.

Plutonium Facility–Glovebox Safety: Weapons Production management is reinvigorating and expanding the glovebox and sharps program following recent glovebox glove events (see 4/21/2023 report). Their intent is to drive to zero preventable glove breaches by October 2023. In order to meet that goal, the new program owners have plans to increase staffing, expand forensic capabilities, and improve integration with conduct of operations mentors and causal analysts.

Onsite Transportation: Triad submitted to the NNSA Field Office for approval an update to the Transportation Safety Document and associated Technical Safety Requirements. The updated documents incorporate NNSA’s suggested compensatory measures within several new specific administrative controls as well as modifications of existing ones (see 3/10/2023 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 9, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending June 9, 2023

Staff Activity: Q. Boney attended a course on hazard analysis review sponsored by the National Training Center at the NNSA Field Office. A staff team held a remote meeting with Triad and NNSA Field Office personnel to discuss conclusions from the staff's review of Triad's atmospheric dispersion protocol that they developed to support modern safety bases compliant with DOE Standard 3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*.

Area G–Work Planning and Control: N3B and Central Characterization Project personnel are working to upgrade the high energy real-time radiography unit at Area G. Last Thursday, radiological control technicians reported concerns that subcontractor personnel had left the work area and Area G without having their tools surveyed out. There was no written requirement to survey tools, and the workers had not been in the area with radiological contamination from a historical spill. Further investigation of this concern identified a series of work planning weaknesses. The person in charge of the job should have been from N3B rather than the Central Characterization Project. The upgrade task was being performed using a generic maintenance radiological work permit. The subcontractor personnel did not meet the training requirements to work under said permit so at the pre-job briefing, the crew decided to work dismantlement of radiologically clean areas under the Facility Radiation Protection Requirements, the minimum basic radiological controls for entry into Area G, rather than under the radiological work permit as called out in the work documentation. This control change was not worked through standard practices and led to confusion on the radiological requirements for this portion of the job. The upgrade project is currently paused while facility personnel redevelop the work documentation for this task with appropriate radiological controls for the different tasks. N3B plans to perform a formal causal analysis on this event.

Plutonium Facility–Criticality Safety: Last Thursday, workers identified a container containing nuclear material that did not have an engineered spacer installed as required for the amount of material being moved. They recovered from the event, and the container is now compliant. This is the fifth event over the past two years where a spacer was missing when required. Facility management plan to evaluate these events for common causes to help prevent recurrence.

Plutonium Facility–Glovebox Safety: On Monday, workers completing a material breakout noticed a crack on a glovebox window. They exited the room under direction of a radiological control technician. There was no evidence of any airborne release or contamination spread; only the inner window of the double pane was cracked. The glovebox underwent an immediate operability analysis the day after the discovery, which determined it was operable as the crack does not impact the confinement function. The breakout activity is rather vigorous as it involves smashing a crucible with the pieces collected in a metal tray. Initial corrective actions include replacing the window, briefing new personnel on spatial awareness during breakouts, and having personnel from the glovebox and sharps program observe the next breakout activity.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 16, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending June 16, 2023

Transuranic Waste Facility (TWF): Last Thursday, TWF personnel discovered a missed Technical Safety Requirement (TSR) surveillance and entered the appropriate limiting condition for operation (LCO). Facility personnel were receiving drums containing sealed sources from Technical Area 55. Prior to receipt of drums in the shipping and receiving area, workers need to perform several TSR surveillances as described in the use-every-time attachment to a reference-use procedure for receipt. They did not perform the surveillance that verifies compliance with sealed source material-at-risk limits due to confusion with the receipt task description in the waste management tracking software. When the error was discovered, workers paused the activity, and entered the LCO. They performed the surveillance successfully a few hours later and exited the LCO. Initial corrective actions to prevent recurrence include modifying how the waste management software addresses receipts to reduce the chance of errors performing the surveillance using data from that database, and evaluating changes to procedures and forms used during receipts.

Plutonium Facility–Criticality Safety: Two weeks ago, workers in a laboratory room identified metal turnings of unknown provenance in a container labeled empty. They paused and reported the discovery per process. The amount of material-at-risk in the glovebox was still below criticality safety limits. A fact finding was later held to discuss the incident.

Area G: Environmental Management Field Office personnel paused retrieval of corrugated metal pipes (CMP) again. Upon questioning whether all workers had current training for silica hazards, it was discovered that not all of the radiological control technicians supporting the excavation activity had said training. The personnel are in respirators to protect from radiological hazards in the excavation, which will also protect against silica. N3B and Field Office personnel are working to lift the stop work and resume excavation. To date, N3B personnel have retrieved a total of four CMPs, one last September, and three following resumption this spring.

N3B and Central Characterization Project personnel completed mobile loading of two trailers of transuranic waste containers for shipment to the Waste Isolation Pilot Plant. Some of these containers did not meet the requirements for indoor shipping through RANT and required mobile loading. This infrequent activity was last performed at Area G in August 2022 (see 8/5/2022 report).

Sigma Facility: Last Thursday, a fire occurred while moving a metal component within a radiological area. The following week, facility personnel held a fact-finding meeting to discuss the incident. Meeting participants observed sparking near an acetone-soaked cloth used for cleaning, followed by ignition of the cloth. The workers immediately stepped away from the flaming cloth. One worker left to search for an extinguishing agent, while another worker extinguished the flames with a nearby cleaning agent. Facility personnel evacuated the facility and made notifications in accordance with approved procedures. Work in the area was paused pending a review of controls to mitigate similar hazards.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 23, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending June 23, 2023

Staff Activity: On Thursday, the resident inspectors met with the NNSA Associate Administrator for Environment, Safety, and Health and members of his staff, along with NNSA Field Office personnel, to discuss health and safety concerns at the Los Alamos National Laboratory. On Wednesday, a headquarters staff team held a remote interaction with Triad and NNSA Field Office personnel to support a complex-wide review of above and underground electrical power cables. On Thursday, a headquarters staff team held a remote interaction with Triad and NNSA Field Office personnel to provide initial conclusions from their review of seismic testing of Fire Suppression System fittings.

Plutonium Facility–Operations: Last Monday, facility personnel were heating a legacy item in a process furnace to burn off excess moisture or nitric species in preparation for disposition. Several hours later, workers noticed an abnormal amount of smoke emanating from the furnace, fogging of the glovebox windows, and elevated furnace temperatures. Workers actuated the emergency shutoff for the furnace and paused their work activities. The following day, operations personnel noticed evidence of a surface reaction on the stainless-steel glovebox internal walls as well as a glossy coating on the glovebox gloves. A fact-finding meeting was held to discuss the incident on Tuesday. Meeting participants noted that the item placed in the furnace may have had excessive residual moisture which was unapparent from external observation. Furnace activities remain paused pending chemical analysis of the glovebox interiors. Facility personnel plan to check for similar legacy materials slated for disposition to prevent recurrence.

Plutonium Facility–Readiness: This week, a contractor readiness assessment team and a federal readiness assessment team started their concurrent review of heat source plutonium harvesting planned at the Plutonium Facility (see 2/17/2023 report).

Plutonium Facility–Glovebox Safety: Last week there was one glovebox glove breach and one glovebox glove failure in the Plutonium Facility. The breach was in a heat source plutonium box where a worker felt airflow along their arm due to a substantial tear in the glove. They responded appropriately and remained in the glove while radiological control technicians arrived to assist. The source of the tear is still under evaluation. The other event was in a weapons grade box where an old, degraded glove developed a small crack upon use. Neither event resulted in skin contamination or any airborne alarms.

Area G–Safety Basis: Last Wednesday, the Environmental Management Field Office and Headquarters approved N3B’s site specific atmospheric dispersion protocol that will support the new Documented Safety Analysis under development (see 4/21/2023 report).

Federal Oversight: Last week, the NNSA Chief of Defense Nuclear Safety issued their report from their 2023 biennial assessment of the NNSA Field Office (see 3/10/2023 report). They reviewed ten functional areas and found that eight met expectations; one, emergency management, exceeded expectations; and one, conduct of operations/facility representative, did not meet expectations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 30, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending June 30, 2023

Staff Activity: J. Abrefah, M. Bradisse, F. Ruz-Nuglo, and E. Tetteh were on-site to continue their glovebox integrity review. Their visit included tours of a cold laboratory and the Plutonium Facility.

Plutonium Facility–Readiness: The contractor and federal readiness assessment teams completed their field activities and presented their initial findings regarding their parallel reviews of readiness to commence heat source plutonium harvesting. The contractor team provided six pre-start findings. The federal team concluded the contractor team performed adequately and mirrored the six contractor findings and added one additional pre-start and one post-start finding. The federal team will finalize its assessment following review of the final report from the contractor team. The most significant findings shared by the two review teams involved material-at-risk controls. There are inconsistencies on allowable material-at-risk within the safety basis supporting this activity, the implementing procedures, and the emergency planning hazards assessment.

Plutonium Facility–Emergency Management: On Wednesday, Triad personnel performed the annual criticality evacuation drill for the Plutonium Facility. The scenario for the field drill was a criticality event in a laboratory room where workers were transferring material-at-risk into a safe and observed a blue flash of light indicating a criticality event. The drill was initiated via sounding of the criticality alarm. The resident inspectors observed facility command actions from the PF-400 operations center as well as the Plutonium Facility evacuation, accountability, and radiation and contamination surveying of evacuees. One key lesson from the drill was that participants noted issues with the badge readers used for accountability, forcing a lengthier manual process.

Plutonium Facility–Decontamination and Decommissioning: Last week, workers were installing glovebags to support removal of solution tanks in an aqueous processing laboratory room. The general criticality safety requirements document for the facility requires that criticality safety personnel evaluate catchments that can collect liquid on a case-by-case basis to determine if a criticality safety evaluation is needed to perform the work safely. There is a specific evaluation for this activity that allows catchments, and the work documentation for this process included a hold point to consult with criticality safety personnel prior to installing the glovebags. Due to equipment issues, the work crew performed tasks in a different order, which later led to the crew skipping this hold point. While there was no immediate criticality safety concern from this event given limited potential for liquids, management is evaluating how to prevent future mistakes of this nature. Improvements include: enhancing consistency across all work requirements documents and improving pre-job briefings to ensure warnings and hold points are addressed before starting work.

Waste Characterization, Reduction, and Repackaging Facility: This week, the NNSA Field Office authorized Triad's request to commence design and modifications to the facility to support future Hazard Category 3 operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 7, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending July 7, 2023

Area G–Operations: Last week, the Environmental Management Field Office approved N3B’s corrective action plan from the federal readiness assessment for corrugated metal pipe (CMP) size reduction. They also authorized startup of the activity. N3B personnel commenced size reduction of CMPs last Thursday, completed one cut on a CMP, and packaged the resulting segment in a standard waste box. This week they completed cutting the first CMP. Each CMP gets four cuts resulting in five segments. Three of the segments were packaged, and the last two remain in the shear assembly in the Dome 375 Permacon. There have been no unexpected radiological conditions during the cutting activity. Meanwhile, retrieval of CMPs continues with seven total units retrieved and staged.

Technical Area 21–Decontamination and Decommissioning: Last Friday, N3B transmitted their quarterly startup notification report to the Environmental Management field office for approval. Last quarter, the field office requested that N3B provide a determination regarding whether readiness reviews would be required for activities at Building 21-257 or the nearby industrial waste lines. In response, this startup notification report included an assessment of initial characterization activities at 21-257 that concluded these sampling activities would not need any formal readiness reviews since they would be performed outside of safety basis controls as a less than hazard category 3 activity. A nuclear criticality safety determination for these activities concluded that they will remain subcritical for all normal and credible abnormal conditions.

Plutonium Facility–Safety Basis: On Monday, Safety Basis personnel entered the new information process to evaluate the discrepancies in material-at-risk limits identified during the readiness assessments for receipt of large heat source plutonium shipments (see 6/30/2023 report).

Plutonium Facility–Infrastructure: Last Monday, the NNSA field office and project office unconditionally approved the latest revision to the safety design strategy for the Los Alamos Plutonium Pit Production Project (LAP4) (see 6/2/2023 report).

Fire Protection: On Friday, the laboratory activated Stage 1 fire restrictions and increased their fire danger rating to very high. This increase was due to continued dry conditions on-site and in the surrounding area. Work restrictions are currently in-place to prohibit or limit certain activities, such as spark producing and shot/burn activities on laboratory property.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 14, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending July 14, 2023

Staff Activity: Headquarters staff members A. Hutain, P. Natividad, and E. Tetteh were on-site to observe the annual emergency preparedness exercise. Hanford resident inspector P. Meyer was on-site for the exercise and to compare resident inspector oversight approaches.

Emergency Management: On Wednesday, Triad conducted the annual full-participation evaluated emergency management exercise, coined TRIT-EX. The scenario was a process upset at the Weapons Engineering Tritium Facility leading to a fire and glovebox breach, releasing both tritium and plutonium. One worker near the event suffered burns and required transport to the hospital and another worker was transported to occupational medicine for behavioral health treatment. Exercise play emergency response actions included: fire department response, shelter-in-place, accountability, and monitoring for airborne radiological contamination. Triad and NNSA personnel are evaluating the exercise performance.

Plutonium Facility–Fire Protection: Last Thursday, the resident inspectors were observing conditions in the Plutonium Facility when one noted what appeared to be paint coating a concealed sprinkler cover plate. Foreign compounds applied to sprinkler components have the potential to impair their operability. They reported this observation to facility management who promptly sent personnel to evaluate the situation. Engineering personnel determined that the foreign material was a drywall compound and found the compound on several other sprinkler head covers. Management paused painting and drywall activities in the facility. The sprinklers are components of the safety-class fire suppression system. Operability evaluations concluded that the impacted sprinkler heads are operable but nonconforming. Facility personnel have spare covers and are planning to replace the impacted units. The pause on drywall and painting activities was lifted on Monday with additional restrictions on working too close to fire system components while physical solutions are under evaluation.

On Thursday, a resident inspector observed oxygen cylinders stored alongside fuel-gas cylinders in the compressed gas cylinder staging area outside of the Plutonium Facility. The storage array did not meet the minimum separation requirements between oxygen and fuel gases in accordance with National Fire Protection Association standards and Occupational Safety and Health Administration regulations. This is a recurring noncompliance that the resident inspectors have observed and reported to facility management (see 12/9/2022 report).

Waste Characterization, Reduction, and Repackaging Facility (WCRRF)–Safety Basis: On Monday, Triad transmitted to the NNSA Field Office for approval a revised preliminary documented safety analysis (PDSA) to support resumption of operations as a hazard category 3 facility. NNSA did not approve the initial revision of the PDSA and this resubmittal is intended to resolve their review comments.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 21, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending July 21, 2023

Staff Activity: D. Brown was on site to observe personnel from the Waste Isolation Pilot Plant perform a generator site technical review on transuranic waste practices at the Plutonium Facility. The review was focused on corrective actions from the titanium sparking event (see 3/5/2021 report).

Plutonium Facility–Safety Basis: Safety Basis personnel concluded that the material-at-risk limit discrepancy identified during the readiness assessments for receipt of large heat-source plutonium shipments constitutes a potential inadequacy of the safety analysis (see 7/7/2023 report). As the process has not started yet, there are no needed actions to place the facility in a safe condition. If the activity is authorized, the more conservative of the discrepant mass limits will be used pending further analysis.

Plutonium Facility–Construction: Last Wednesday on the swing shift, construction personnel tied in a new glovebox to ventilation and the dry vacuum system. The next morning, dayshift personnel noticed that the glovebox had too much negative ventilation on it resulting in grossly distended glovebox gloves sucked into the box. The valves to the dry vacuum system were open while the damper to ventilation was closed. New glovebox tie-ins are currently an infrequent activity but will become more frequent as the facility continues construction efforts to support the pit production mission. The work documentation for the installation did not include hold points, and the workforce does not have much experience with this type of work. The valve alignment has been corrected, and activities in this box are paused until facility management confirms that the conditions are safe and stable. The glovebox gloves are degraded and will need to be replaced as will filters that were damaged by oil migration. Moving forward, facility and construction personnel plan to improve their work documentation for installation to better integrate with the glovebox installation checklist from glovebox installation engineering specifications.

Chemistry and Metallurgy Research Building (CMR): CMR personnel did not complete an annual in-service inspection of a passive safety-class design feature within the required periodicity and did not enter the grace period process to extend the allowable time to completion. The inspection was due last Wednesday. It consists of verifying that the vertical rise of walls providing credited fire protection separation between wings 3, 5, 7 and 9 are not degraded and have no new penetrations or modifications. Personnel realized the error last Friday and completed the inspection successfully this Monday. There are several existing practices at CMR to track required technical safety requirement surveillances including discussions of the status board during shift turnover, however these were not successfully used. Facility management is evaluating approaches to improve their tracking practices and ensure compliance with them.

Wildfire Hazards: On Wednesday, there were several lightning induced wildfire starts on land near the laboratory. Emergency operations personnel do not believe current conditions are likely to result in substantial fire growth or impact to laboratory facilities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 28, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending July 28, 2023

Staff Activity: M. Bradisse, R. Eul, D. Minnema, and B. Weathers were on site for another visit supporting their review of nuclear criticality safety (see 3/24/2023 report). Their visit included observations of a fissile material move and several fissionable material operation reviews in the Plutonium Facility.

Plutonium Facility–Safety Basis: On Thursday, facility management entered the limiting condition for operations pertaining to material-at-risk limits and directed all nuclear material on the first floor be placed in a safe configuration. Engineering personnel discovered an inconsistency with software version control on a tool used to track material-at-risk to ensure compliance with safety basis limits. While the software issues are being resolved, the compliance with limits is indeterminate, and the first floor of the facility is in limited operations mode.

Safety Basis personnel concluded that the material-at-risk limit discrepancy identified during the readiness assessments for the receipt of large heat-source plutonium shipments constitutes a positive unreviewed safety question (see 7/21/2023 report). The discrepancy has the potential to increase the consequences of an accident previously evaluated in the facility design basis and the consequences of a malfunction of equipment important to safety. Changes to the documented safety analysis and NNSA approval will be required prior to startup of this activity. As the safety basis addendum required NNSA headquarters to accept risk beyond DOE’s evaluation guideline for postulated consequences to the public, any adjustments to the safety basis should go through a similar review at the headquarters level (see 4/1/2022 report).

Plutonium Facility–Worker Safety: Senior management for Weapons Production and Plutonium Infrastructure are concerned by recent laboratory-wide negative trends in hazardous energy control events (see 2/10/2023, 4/21/2023, 6/2/2023 reports for examples in nuclear facilities). This week they started a series of briefings to all supervisory personnel who are charged with disseminating the content to their workforces by the end of August. The briefings provided a summary of recent hazardous energy events, plans for improving training, and planned changes to lockout/tagout procedures and policies. Management also discussed the importance of pausing work, their expectations for pre-job briefings when hazardous energy controls are required, and that zero energy checks for maintenance and construction tasks must have a superintendent or higher individual present to witness the check and verify the adequacy of the lockout/tagout in place.

Federal Oversight: The NNSA Field Office completed a staffing analysis of facility representative coverage for fiscal year 2023. The analysis gave a recommended staffing level of 19 full-time equivalent facility representatives including nine assigned to the Plutonium Facility. Current staffing is at 13 with three assigned to the Plutonium Facility. The field office continues with hiring efforts; however, this is limited by overall staffing caps.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 4, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending August 4, 2023

Staff Activity: H. Dacayanan was on site to attend the project review discussed below.

Plutonium Facility–Infrastructure: NNSA personnel were on site to perform a Technical Independent Project Review for the Los Alamos Plutonium Pit Production Project (see 5/6/2022). The team reviewed such nuclear safety topics as safety basis, nuclear criticality safety, and fire protection as well as scheduling and project management. The team is finalizing its conclusions and will brief them to NNSA and Triad management.

Plutonium Facility–Safety Basis: On Saturday morning, Plutonium Facility personnel exited the limiting condition for operations and returned to normal operations mode following resolution of the software version control issue for material at risk tracking on Friday evening (see 7/28/2023 report). Triad personnel believe the version error most likely came about due to the high workload of personnel who must address frequent software version changes. Another potential error contributor was the interface between testing and development organizations. Corrective actions are in progress to prevent further errors of this type.

The NNSA Field Office transmitted to Triad their comments from their review on the leak path factor and atmospheric dispersion methodology (see 5/5/2023 report). The revised methodology couples leak path factor and atmospheric dispersion to support the modern safety basis under development for the Plutonium Facility. The Field Office requested Triad submit a revised methodology incorporating all changes based on their comments within 45 days.

Plutonium Facility–Fire Protection: On Wednesday, facility management performed a walkdown to assess storage of compressed gas cylinders near the Plutonium Facility. This was part of an extent of condition review of cylinder storage at related facilities following issues identified with code compliance during the federal operational readiness review at PF-400. It also served to address frequent non-compliances with cylinder storage adjacent to the Plutonium Facility (see 7/14/2023, 12/9/2022 reports). During the walkdown, management identified several non-compliances including comingling of oxidizers and flammables, inconsistent labeling practices, and unsecured cylinders.

Emergency Management: Two weeks ago, there was a telephone service provider outage that affected most of New Mexico and impacted voice communications for Triad facilities laboratory-wide. The error originated at the provider's substation where telephone routing was corrupted, affecting landline telephone calls originating from the laboratory for approximately one and a half hours. As the telephone lines at the Emergency Operations Support Center (EOSC) were non-functional, site workers were notified to call 911 in the event of an emergency. Concurrent with this outage, the laboratory also experienced an unrelated network outage such that e-mail and messaging were not available. As a result, the EOSC relied on radio communications and cellular networks. Efforts to improve redundancy have been in progress since previous events of this type. These include providing backup contact information to Los Alamos County officials and facility operations center personnel as well as issuing and training personnel on the use of backup communications methods.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 11, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending August 11, 2023

Environmental Management–Safety Basis: N3B held another workshop to support development of a modern DOE-STD-3009-2014 compliant safety basis for Area G (see 03/24/2023 report). The workshop also included discussions for developing a Technical Area 21 safety basis to support sampling prior to decontamination and decommissioning. Several staff members from DOE Environmental Management Chief of Nuclear Safety’s office were onsite to attend the workshop. Meeting participants discussed proposed safety controls for the new Area G safety basis. A resident inspector accompanied workshop attendees on an Area G tour. One purpose of the tour was to observe the implementation of controls in Dome 33. Another was to observe flanged tritium waste container standoff distances which have now extended into the footprint of Dome 49 because of expected pressure increases over time due to tritium decay.

Transuranic Waste Facility (TWF): While restoring the system following performance of a surveillance on a channel of the safety-class seismic power cutoff switch, a fastening device sheared. Facility personnel determined this made the system inoperable and entered the appropriate limiting condition for operations. This requires all waste storage buildings at TWF be placed in warm standby, meaning transuranic waste drums may be stored but no other operations such as movements or gas sampling may be performed. Engineering personnel are evaluating how to restore the system to operability.

Plutonium Facility–Criticality Safety: Last week, workers moved a plutonium item into a dropbox with another item in it such that their combined masses exceeded criticality safety limits. The items were in water resistant containers with engineered spacers. When the workers recognized their error, they paused and made the appropriate notifications. The overmass was within the safe upset conditions analyzed in the criticality safety evaluation. Triad management is planning a causal analysis on this event and a comprehensive casual analysis reviewing overmass events in the past year to determine if common elements exist. Separately, efforts already in progress to improve the material move procedure to reduce the potential for human error are nearing completion.

Last week, workers disconnected a dropbox from adjacent gloveboxes to prepare for removal from the facility. However, this action rendered the seismic qualifications of the remaining gloveboxes indeterminate. One of those boxes had a criticality safety requirement to be seismically qualified. When personnel recognized this issue later in the week, they paused and made appropriate notifications. The non-compliant box has been placed out of service. It is also slated for removal, but still contains nuclear material. Corrective actions include evaluating the current seismic qualification of the non-compliant glovebox, evaluating integration process to assure glovebox removals recognize all requirements, and performing an extent of condition review of gloveboxes connected to those planned for removal to determine whether they could have a similar seismic non-compliance issue.

Plutonium Facility–Infrastructure: On Tuesday, the NNSA Project and Field Offices unconditionally approved the preliminary safety design report for the Los Alamos Plutonium Pit Production Project 30 reliable mission. Their approval included safety basis review comments that they requested be included in the future submittal of the final preliminary documented safety analysis at the final design stage.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 18, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending August 18, 2023

Staff Activity: Y. Li was on site to attend a Probabilistic Seismic Hazard Update workshop.

N3B–Training: Last week, Environmental Remediation personnel discovered discrepancies in the training qualifications for nuclear facility operations, supervisory, and management personnel. Given the indeterminate training status of required personnel, they stopped all field work in Technical Area 21 and the nuclear environmental sites. These qualification issues also apply to Area G where management paused work this Tuesday and then stopped work on Wednesday morning. All waste domes are currently in warm standby with only minimum safe operations authorized. N3B management is working to ensure that Area G has sufficient qualified personnel to meet minimum staffing requirements in the technical safety requirements and that all the nuclear sites have qualified operations management. They are also developing a matrix of personnel versus gaps with position requirements and working to fix training materials to ensure they cover all requirements from the approved qualification standard and the DOE training order.

Plutonium Facility–Radiological Safety: Last Friday, four continuous air monitors (CAM) alarmed in a laboratory room that processes heat source plutonium. Shortly after, CAMs in an adjacent room alarmed. Workers in the first room were not wearing respiratory protection and evacuated per response protocol; no one was present in the second room. The crew had been replacing glovebox spool doors with the new model that eliminates use of the braided wire cables that caused a puncture in 2018 (see 2/8/2019 report). There was no contamination detected on the individuals undergoing bioassay to determine if there was any uptake. The most likely cause of the airborne activity was a release from one of the spool pieces connecting to the dropbox where the workers were installing doors to adjacent gloveboxes. Both rooms are restricted while recovery efforts are in progress. Facility management paused work on all door replacements in the facility wing where the event occurred while corrective actions are developed.

Onsite Transportation: Last Thursday, the NNSA Field Office conditionally approved the latest revision to the Packaging and Transportation Safety Document and Technical Safety Requirements (see 6/2/2023 report). There were two conditions of approval. Both relate to addressing Field Office comments. One requires that specified comments be addressed no later than the 2023 annual update of the documents, and the other that remaining comments be addressed no later than the 2024 annual update with quarterly briefings on closure status.

Transuranic Waste Management–Safety Basis: Triad submitted to the NNSA Field Office for approval revisions to the longstanding evaluations of the safety of the situation (ESS) for potential hazards of nitric acid and anion exchange resin in transuranic waste drums for the Transuranic Waste Facility, the Chemistry and Metallurgy Research Building, and the Plutonium Facility (see 2/5/2021 report). The revisions state that experiments with anion exchange resins demonstrated no potential for rapid drum pressurization; thus, there is no unanalyzed event involving anion exchange resins in waste drums. The revised ESSs therefore request removal of compensatory measures and closure of the potential inadequacy of the safety analysis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 25, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending August 25, 2023

Staff Activity: M. Sautman gave a presentation on DNFSB activities in New Mexico to the Radioactive and Hazardous Materials Committee of the New Mexico State Legislature. Presentation materials can be found on the committee's website.

Weapons Engineering Tritium Facility (WETF)–Readiness: A federal team commenced a readiness assessment to evaluate startup of plutonium coupon studies at WETF (see 3/3/2023 report). This week, the team observed work demonstrations including an operational drill where a continuous air monitor alarmed due to plutonium, a new hazard of this activity. The review is expected to conclude next week.

Plutonium Facility–Radiological Safety: Last Tuesday, there was a contamination spread in a laboratory room. A worker requested radiological control technician (RCT) support to investigate an alarming survey monitor. The RCT confirmed contamination on the monitor and directed the large number of workers in the room to begin an orderly exit. Exit monitoring discovered several contaminated booties on workers. No workers had skin contamination in this event, and there was no evidence of airborne radioactivity. The cause of the contamination spread was traced to a breached glovebox glove. There was substantial contamination discovered around this glovebox during follow-up surveys. The room underwent decontamination and was released for work last Wednesday. The following day, in the same room, a worker performing administrative work at a computer alarmed a monitor upon exiting the room. RCTs discovered a hot particle on the skin of the individual's hand. Corrective actions in progress include an additional sharps walkdown of processes in this room, use of longer overgloves to protect the area of the glovebox glove that was damaged in the first incident, and a complete wipedown of the room.

Plutonium Facility–Safety Basis: On Monday, facility personnel entered an unplanned limiting condition for operations due to exceedance of material at risk (MAR) on a transuranic waste storage pad outside of the facility. Personnel were performing mobile loading of pipe overpack containers (POC) with high MAR that cannot be transported to the RANT Shipping Facility. While POCs have a damage ratio associated with them in the safety basis, on the waste pad, only the outermost container's damage ratio can be applied. Once the POCs were overpacked into standard waste boxes prior to being loaded into the TRUPACT, they lost their damage ratio and exceeded MAR limits on the pad. One TRUPACT was fully loaded and sealed for shipment to the Waste Isolation Pilot Plant prior to discovery of the MAR exceedance. The TRUPACT has a damage ratio of zero which exempts its MAR from the limits. The other standard waste boxes were opened and unloaded to restore compliance with the technical safety requirements. An approach to compliantly ship the remaining high MAR containers is being developed.

Transuranic Waste Facility (TWF)–Safety Basis: On Thursday, TWF personnel exited the limiting condition for operations regarding operability of one of the seismic power cutoff switches (see 8/11/2023 report). Engineering personnel completed an evaluation concluding that in the condition with the damaged fastener, the seismic switch is operable but degraded and can continue to perform its safety function. Efforts to fully repair or replace the degraded switch are in progress.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 1, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussof and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending September 1, 2023

Plutonium Facility–Safety Basis: Last Thursday, Triad submitted to the NNSA Field Office for approval an evaluation of the safety of the situation (ESS) pertaining to the recent positive unreviewed safety question for receipt and processing of large shipments of heat source plutonium (see 7/28/2023 report). The ESS maintains material at risk (MAR) restrictions using the lower of the two MAR limits discussed in the safety basis addendum supporting this activity. However, the ESS proposes that a revised addendum be submitted that analyzes the consequences from the higher of the two MAR limits and uses that as the limit for processing. As this change would increase doses to the public even further beyond the evaluation guideline, NNSA headquarters will need to approve the addendum in addition to the field office to accept that level of risk. The mitigated dose consequences to the public from this operation are already analyzed to range from 495-3175 rem depending on the leak path factor used (see Board Letter 8/11/2022). The Board’s staff expects the new addendum to show an increase upwards of 30 rem. This increase by itself exceeds the evaluation guideline of 25 rem.

Last Monday, Triad transmitted a revised atmospheric dispersion protocol to the NNSA Field Office for concurrence (see 8/4/2023 report). One change in this revision is discussion of an approach to use an alternative distance for collocated worker receptors for existing remote facilities.

Weapons Engineering Tritium Facility–Readiness: The federal team completed the readiness assessment for startup of plutonium coupon studies (see 8/25/2023 report) and briefed their conclusions to contractor personnel. They identified three pre-start findings one of which involved an ambiguity as to whether the technical safety requirements allow coupon operations to take place in standby mode.

N3B–Training: N3B personnel are continuing their efforts to resolve training issues and the stop work remains in place (see 8/18/2023 report). Minimum staffing at Area G has been compliant with the technical safety requirements since August 19th.

Area G–Safety Basis: Two Fridays ago, workers performing routine inspections in Area G observed a utilities pole swaying due to high wind. The workers notified facility management who contacted Triad utilities for support. Area G facility management authorized Triad to enter a combustible restrictive area with their utilities vehicle to assess the hazard and secure the utility pole. Though authorized, this entry introduced a larger quantity of fuel than analyzed in the safety basis, and a technical safety requirements violation was declared. This was an allowable action outside of the technical safety requirements as addressing the issue with the utility pole was necessary to protect workers, the public, or the environment from imminent and significant harm.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF)–Safety Basis: Last Thursday, the NNSA Field Office conditionally approved a revised preliminary documented safety analysis that supports restart of WCRRF as a hazard category 3 facility (see 7/14/2023 report). The first condition of approval was to designate the lightning protection system, the fire detection and alarm system, and continuous air monitors as other hazard controls in the upcoming documented safety analysis for WCRRF restart. The other is to evaluate, update, and resubmit the three previously approved equivalencies from the safety design strategy.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 8, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending September 8, 2023

Staff Activity: A staff team held a remote meeting with Triad and NNSA Field Office personnel to discuss initial conclusions from its review of the glovebox integrity (see 6/30/2023 report).

Plutonium Facility–Radiological Safety: Last Thursday, a worker alarmed the hand and foot monitor while exiting a laboratory room. Responding radiological technicians discovered contamination on the worker’s protective bootie. Further investigation of the room, which processes heat source plutonium, discovered contamination below a glovebox and flaky material that appeared to be corrosion products. Workers noted that it is not uncommon to spill liquids in that dropbox, as the caps for the carboys are often not fully sealed and are easily knocked over. There have also been instances of carboys leaking in gloveboxes (see 6/15/2018, 6/26/2019 reports). Workers taped the underside of the glovebox to control further flaking and contamination spread. The glovebox is posted out of service and the access to the room is restricted. Facility personnel are developing a room entry plan to gather more information, which will include collection of flaky material for chemical analysis. Engineering personnel will evaluate the integrity of the glovebox. Once additional data is collected to understand the condition of this glovebox, personnel plan to perform an extent of condition review of other gloveboxes with the potential for liquid spills and unexpected corrosion.

Plutonium Facility–Safety Basis: The contractor completed and submitted the revised safety basis addendum supporting the receipt of large quantities of heat source material (see 9/1/2023 report). The NNSA Field Office and headquarters are reviewing the submittal.

Work Planning and Control: Last Wednesday, personnel from a sub-tier construction contractor damaged the fence around a material disposal area. The workers were performing excavation work supporting the Transuranic Liquid Waste Project. They did not pause work and decided to repair the damaged fence. While replacement of this fence is part of this subcontractor’s scope, the fence repair they performed was not in their authorized scope of work for the day. During cutting activities for the repair, a small fire ignited in the vegetation in the material disposal area. The workers extinguished the fire with water and a fire extinguisher, made notifications to operations personnel, but did not call the fire department as required. Operations personnel called the fire department who did respond to verify the fire was fully extinguished. There was no hot work permit for this activity. Also, as the laboratory was under Stage II fire restrictions at the time, any hot work activities would have required review and approval by fire protection engineering personnel. Management paused the work until a training event could be held to reinforce the importance of pausing work, emergency notifications protocols, work scope definition, and content of prejob briefings.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF)–Safety Basis: Last Friday, Triad submitted to the NNSA Field Office for approval a documented safety analysis that supports restart of the WCRRF as a hazard category 3 nuclear facility, downgraded from its original hazard category 2 designation. The submittal includes changes requested in the recent conditional approval of the preliminary documented safety analysis (see 9/1/2023 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 15, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending September 15, 2023

Staff Activity: M. Bradisse was on site this week providing resident inspector augmentation. Support activities included plutonium facility walkdowns, meetings with Environmental Management Field Office and N3B personnel, and attendance at fact findings.

Chemistry and Metallurgy Research Building (CMR): This week, facility personnel held a fact-finding meeting to discuss an individual who had entered radiological controlled areas in CMR without a dosimeter. The individual, a recently hired radiological control technician (RCT), finished the RCT training pipeline and was assigned to CMR starting on August 21. However, upon completion of training, the individual never received a dosimeter. Despite this, the individual proceeded to perform daily surveillances and other routine work on several occasions under an integrated work document, always in the company of other RCTs. On September 7, during preparation for a new work activity involving a radiological work permit, the individual self-identified that they had never received a dosimeter. Facility personnel have concluded that the individual likely did not receive any dose above background levels, based on the type of work conducted and the doses historically assigned to the other RCTs during such activities. The primary proposed corrective action was to task the radiation protection organization with reviewing the dosimetry assignment process and ensuring that newly qualified RCTs receive their dosimeters prior to starting work at their first assigned facility. Additionally, CMR facility personnel proposed reviewing onboarding processes to help ensure this situation does not occur in the future. Personnel at the meeting also discussed, but did not conclude, whether this event would be reportable per DOE O 232.2A, *Occurrence Reporting and Processing of Operations Information*.

N3B–Training: N3B personnel are continuing their efforts to resolve the training issues identified last month (see 8/18/2023 and 9/1/2023 reports). The organization has qualified sufficient personnel to perform surveillances to fulfill technical safety requirements and conduct corrugated metal pipe size reduction activities. To do this, N3B management reconstituted training records by cross referencing requirements from DOE O 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*, with known existing qualifications for each individual performing this work, and then conducted remedial training as necessary. The stop work remains in place for other work activities. N3B management personnel have stated that the next priority activity needing qualified workers is glovebag operations, given near-term deadlines stemming from readiness activities nearly a year ago (see 9/20/2022 report).

When N3B took over its scope from the previous contractor in 2018, it retained relevant training and qualification programs. In 2020, N3B committed to instituting its own requalification program; however, this action was not satisfactorily completed, and key requirements from DOE O 426.2 were never properly implemented. N3B personnel are performing a causal analysis to determine how this occurred.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 22, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending September 22, 2023

Staff Activity: C. Beaty, M. Bradisse, D. Bullen, J. Heath, and L. Lin were on site this week as part of their review of decontamination and decommissioning activities at the Plutonium Facility (see 5/19/2023 report). During this visit, they observed the removal of a glovebox from the facility and placement into a waste container outside of the facility. They also walked down rooms with Plutonium Infrastructure personnel to observe current and planned equipment removal activities, contamination enclosure practices, and radiological control techniques. Additionally, they met with training personnel, radiological control management, waste management personnel, and work planners.

Plutonium Facility–Emergency Response: On Wednesday morning workers were performing an activity to split and dispose of legacy heat source plutonium material. The material was a process residue consisting of pyrolyzed cheesecloth with plutonium residue. It was packaged in an inner container bagged in a heavily degraded bagout bag placed in an outer container. As the workers opened the inner container in a glovebox and placed the material in a catch pan, they identified smoke, but no flames, coming from the material. The workers activated the dropbox fire alarm, exited the room, and contacted the operations center as required. The fire department responded and identified no anomalous heat signatures or other indications of an active fire and turned the scene back over to the facility. Meanwhile, other workers in the Plutonium Facility were directed to perform an orderly exit. Activities in the Plutonium Facility were restricted until Wednesday afternoon when the facility was released back to normal operations. Workers performed an observation of the material in question and identified no other anomalous behavior. They believe the smoking was caused by pieces of the degraded plastic bag falling on the thermally hot heat source plutonium residue. Work with this type of material is paused, and the glovebox where the event occurred is out of service until a recovery plan is developed. Facility personnel are developing corrective actions to help prevent future events with legacy materials. Facility and Emergency Management personnel are also developing actions to improve emergency response. One notable issue during the event was lack of attention to public address announcements.

Plutonium Facility–Infrastructure: Triad personnel recently submitted two safety basis documents supporting infrastructure upgrades to the NNSA Field Office for approval. Last Friday, they submitted a revised addendum for installation of a second seismically qualified uninterruptible power supply (UPS). The revision addressed a directed change from the Field Office to include surveillances of the criticality alarm system and site public address system following realignment of the UPS. This Wednesday, they submitted a temporary modification to the safety basis that would allow non-safety-credited process compressed air to feed the safety-significant instrument air system to provide a backup source of pressurized air while the instrument air system undergoes upgrades to improve reliability.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 29, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending September 29, 2023

Staff Activity: Staff from the Nuclear Regulatory Commission's Office of the Inspector General were on site Tuesday for site familiarization and oversight of the resident inspectors.

Plutonium Facility–Criticality Safety: Two months ago, workers removed containers from the vault for repackaging. Upon opening these containers in a glovebox last month, they discovered that the nuclear material items were surrounded by thick polymer shielding that was unanalyzed in the criticality safety evaluation for the glovebox. To recover from this criticality safety infraction, they closed the containers and sent them back to their original vault locations under the assumption that they their original storage conditions were compliant with criticality safety requirements. Two weeks ago, personnel identified that the thick shielding is unanalyzed in the criticality safety evaluations for the vault locations as well. The vault locations containing these items and adjacent locations are currently restricted. An extent of condition review has identified that there are likely more of these shielded containers in the vault and personnel are evaluating appropriate operational restrictions. Meanwhile, criticality safety personnel are working calculations to verify safe configurations when thick shielding is present and evaluating the process for recovering from criticality safety infractions to ensure that recovery from one event does not lead to another. Personnel are also working with the Offsite Source Recovery Program to see if these high-dose items that need shielding can be disposed of through that program with minimal processing and worker exposure.

Legacy Facilities: Last Friday, N3B submitted a new documented safety analysis (DSA) supporting activities at Technical Area 21 to the Environmental Management Field Office for approval. The DSA is intended to replace the justification for continued operations that has been in place for several years since sampling data suggested Building 21-257 and the buried Industrial Waste Lines may exceed inventory thresholds and be nuclear facilities. Work allowed under this DSA is limited to surveillance and maintenance, removal of debris, and limited sampling and characterization. The proposed controls include two specific administrative controls: an inventory control program to protect material at risk assumptions, and a limit on the length of industrial waste line that can be exposed.

Radioactive Liquid Waste Treatment Facility (RLWTF)–Emergency Management: On Tuesday, there was an emergency preparedness drill at the RLWTF. The scenario was a forklift backing into a chemical storage building causing a partial building collapse and a fuming nitric acid spill and plume. RLW personnel performed a controlled exit from radiologically controlled areas and sheltered in place until receiving direction from the Emergency Operations Center to evacuate. Construction subcontractors working on the Transuranic Liquid Waste project also participated in the drill and relocated to a shelter in place location then evacuated. Drill performance was largely positive; however, there was some confusion on wind directions based on instrumentation readouts compared to a windsock. Emergency management personnel are following up on this apparent discrepancy.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 6, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending October 6, 2023

Plutonium Facility and Radioactive Liquid Waste Treatment Facility (RLWTF)–Tritium: Last week, Triad personnel determined that routine tritium releases from the Plutonium Facility’s stack had re-entered the facility due to atmospheric conditions. This same type of event happened on a much larger scale in January 2022 at the Savannah River Tritium Enterprise (see Board letter on tritium release event dated 8/11/2022). The first evidence of unusual tritium migration was in August when RLWTF started seeing elevated tritium readings in influent liquids. Readings remained in the nanocurie per liter range but were higher than normal which prompted action. In mid-September, further investigation determined the source of the tritium was the Plutonium Facility. Management paused all tritium activities in the Plutonium Facility last Monday. Triad personnel are still gathering information from this event and plan to hold a fact-finding meeting next week. Both facilities have entered the new information process to determine the safety basis implications of the unexpected tritium.

Plutonium Facility–Safety Basis: On Tuesday, Triad personnel met with NNSA Field Office and NNSA Environment, Safety, and Health (ESH) leadership to discuss the revised safety basis addendum for receipt and repackaging of large quantities of heat source plutonium (see 9/8/2023 report). NNSA ESH is the safety basis approval authority for this addendum given that the mitigated consequences during the bounding accident exceed the evaluation guideline for the public. NNSA ESH leadership has changed since the original approval and risk acceptance for this activity (see 4/1/2022 report). The meeting also included discussions on whether additional work could be performed at Idaho National Laboratory prior to shipment of this material to reduce risks at Los Alamos National Laboratory and on actions taken based on the Board’s letter dated August 11, 2022, regarding this activity.

Plutonium Facility–Glovebox Safety: On Monday, a glovebox worker using a measuring caliper saw visual evidence of a breach in one of their glovebox gloves. Responding radiological control personnel determined that there was indeed a glovebox breach. The impacted individual had contamination on a personal protective equipment glove, but no skin contamination. There was no evidence of an airborne contamination spread. During the response, there was a challenge locating respirator masks as the response cabinet closest to the event was depleted. The cause of the breach was the sharp caliper which is an alternative tool that was in use due to an electronic measurement device in the glovebox being out of service. Corrective actions under evaluation for this event include: evaluating the use of a different type of caliper, ensuring sufficient respirator masks are available for responses, reinforcing movement restrictions for workers involved in a suspected breach, and issuing a lessons learned report.

N3B–Training: N3B personnel are continuing their efforts to resolve the training issues identified in August (see 9/15/2023 reports). N3B is using a senior management review board to individually release specific activities while the overall stop work remains in place. So far at Area G, they have released offsite waste shipments, onsite material moves, technical safety requirements surveillances, and corrugated metal pipe cutting. All these activities have been performed since their release. This week Area G personnel moved waste to the RANT Shipping Facility and resumed corrugated metal pipe cutting. A root cause analysis for the training issues is in progress.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 13, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending October 13, 2023

N3B–Training: Last Friday, the causal analysis team investigating N3B’s training issues transmitted its report to the Environmental Management Field Office (see 10/6/2023 report). They found the root cause of the event to be that N3B did not ensure their training program: clearly provided instructions to implement all the requirements of DOE Order 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*; was executable as intended; and was updated as changes occurred. The direct cause was that N3B did not have an adequately documented training or tracking method to meet requirements for qualifications and requalification for Contact-Handled Transuranic Waste and Environmental Remediation activities. Contributing causes were identified in the areas of staff retention, human performance, management, and communications. The team also provided seven recommendations, which included: revising the N3B qualification standards and training implementation matrix; improving the learning management system to show a clear, consistent, and verifiable qualification status for each individual; and performing an extent of condition to assess if similar inconsistencies are affecting other safety management programs.

Plutonium Facility–Infrastructure: The Plutonium Facility entered limited operations mode at the end of last week to perform a variety of equipment upgrades and repairs. One key activity was installation of new instrument air compressor equipment. The instrument air system is a safety-significant support system, and non-credited process air was used to keep the ventilation system operational during installation (see 9/22/2023 report). System health reporting on the instrument air system had identified that the compressors were approaching end of life. This week, the south side of the facility remained in limited operations mode to support fire suppression system work. On Thursday evening, the entire facility returned to limited operations mode to support electrical maintenance over the weekend.

Onsite Transportation: Last Thursday, Triad submitted to the NNSA Field Office for approval a revised version of the Transportation Safety Document and associated Technical Safety Requirements. This latest revision is the 2023 annual update of the document and is intended to address field office comments from its conditional approval of the previous revision (see 8/18/2023 report). Remaining field office comments will be addressed in the 2024 update.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF): Efforts continue to restart WCRRF as a hazard category 3 nuclear facility. At the end of September, Triad provided the NNSA Field Office with a schedule to reconstitute the code of record for the facility. Triad now plans to have a final code of record to support startup by October 2024. Triad also provided NNSA with a safety basis addendum to the current hazard category 2 document that will authorize transition activities including decontamination of the Glovebox Enclosure and receipt and size reduction of uncontaminated large pieces of equipment, such as gloveboxes. Last week, Triad submitted an updated fire hazards analysis that is intended to address a condition of approval from NNSA’s approval of the preliminary documented safety analysis (see 9/1/2023 report). The document provides an updated status of all current equivalencies in the facility and a discussion of gaps from requirements. Two notable gaps leave the facility more vulnerable to exterior fires. There is one large section of the exterior stucco wall that has failed and is being repaired. Also, fire resistance properties of the exterior insulation finishing system led to a recommendation to restrict combustibles around the building.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 20, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending October 20, 2023

Plutonium Facility and Radioactive Liquid Waste Treatment Facility (RLWTF)–Tritium: Triad personnel held a fact-finding meeting to discuss the recent event involving tritium migration from the Plutonium Facility to RLWTF (see 10/6/2023 report). In addition to the atmospheric conditions that allowed tritium to reenter the Plutonium Facility through the building air intake, more tritium than usual was released during operations because the gas treatment system, a non-credited system that reduces the amount of tritium released up the stack, was not functioning properly. Released amounts were within permit limits. Safety basis personnel concluded that the event did not constitute a potential inadequacy of the safety analysis for either facility. In RLWTF, while the increase in tritium concentration exceeded the drinking water thresholds the facility uses as a limit, it was orders of magnitude lower than the amount of tritium analyzed in the safety basis. For the Plutonium Facility, while there was an acknowledgement that this scenario where material returned to the facility was not analyzed in the safety basis, the quantities were so small, they could be considered as contamination level and were covered in other hazard analysis scenarios. The resident inspectors believe it would be prudent to do a more thorough, bounding analysis of this type of scenario as part of the development of the new safety basis for the Plutonium Facility. Triad personnel are continuing to recover from the event and are actively decontaminating the inlet air dryers. They also plan to decontaminate the glovebox where the tritium work took place, repair and upgrade the gas treatment system, and rewrite procedures for tritium operations to include weather condition checks and other improvements.

Plutonium Facility–Infrastructure: NNSA’s Technical Independent Project Review team issued the final report for its review of a subproject of the Los Alamos Plutonium Pit Production Project (see 8/4/2023 report). The report concluded that the safety basis documentation is at an appropriate level of maturity for this stage of the project with an approved safety design strategy and a submitted preliminary documented safety analysis. The report had eight recommendations, three of which were within the technical scope. Those were: update the technical maturation plan to identify critical attributes of systems that need to be identified to support achievement of technical readiness level seven, complete an analysis of upset conditions within a glovebox that could result in fire and explosion hazards, and identify and implement actions to accelerate assessment of actual demands for utilities and balance of plant systems to determine if modifications/upgrades are required to ensure that final installed systems will fully support mission needs.

The Plutonium Facility exited its outage and returned to normal operations on Monday (see 10/13/2023 report). During the final stages of the outage, facility personnel replaced many of the sprinkler heads in one side of the basement to support the upcoming 50-year replacement cycle. They also completed planned high voltage electrical work.

Federal Oversight: The Environmental Management Field Office conducted training for all staff on oversight. This training was a corrective action stemming from an assessment of the N3B contractor assurance system and the Field Office’s oversight activities earlier this year (see 2/24/2023 report). The training covered the fundamentals of oversight including contractual requirements; executing oversight activities such as assessments and surveillances; and effective issue identification and communication. The Field Office is planning additional training on this topic.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 27, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending October 27, 2023

Emergency Management: On Tuesday, Triad personnel held a full-scale emergency exercise at the Los Alamos Neutron Science Center (LANSCE). The scenario started with an overhead crane dropping a load onto a shutter containing mercury contaminated with neutron activation products. This caused a large spill of mercury, and the adjacent workers were exposed. Soon after the spill, a large fire started, which provided energy to vaporize substantial amounts of mercury and form a significant plume. Exercise play included evacuations and shelters in place at LANSCE as well as a fire department and hazardous materials team response. N3B personnel also played in a limited capacity with a simulated evacuation of workers in Technical Area 21 and the canyons near LANSCE. Triad personnel are formally evaluating exercise performance with an emphasis on objectives related to corrective actions from previous exercises.

Plutonium Facility–Radiological Control: Last week, there were two skin contamination events in the same laboratory room. This room has a contamination control tent set up around a glovebox to support decontamination and decommissioning work. In the first event, a radiological control technician supporting a hot job in the tent surveyed out of the tent successfully but identified contamination on their hand during exit monitoring from the room at the hand and foot monitor. On the afternoon of the same day, a supervisor who was working outside of the same tent found contamination during a scan at the personnel contamination monitors on building exit after clearing the hand and foot monitors on room exit. Both individuals were successfully decontaminated, and there was no evidence of an airborne release in either event. While the exact source of the contamination for these events is indeterminate, facility personnel have several corrective actions to address potential causes. These include: modifying the process for doffing and surveying powered air purifying respirators, ensuring respirator storage cabinets are part of routine radiological monitoring, and evaluating personal protective equipment requirements for construction supervisors.

Plutonium Facility–Safety Basis: On Monday, the NNSA Field Office responded to Triad's request for concurrence on their latest revision of the atmospheric dispersion modeling protocol that will support the new safety basis for the Plutonium Facility (see 9/1/2023 report). The Field Office stated that Triad must revise the protocol within 45 days to address provided comments prior to obtaining concurrence. Key items the field office requested included: justification of the overall reduced conservatism in the proposed methodology from changes to plume meander, justification for not using the default dispersion parameter from DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, to calculate co-located worker dose consequences, and clarification on remote facilities using a distance greater than 100 m for co-located worker consequences.

Transuranic Waste Facility (TWF): Two Saturdays ago, TWF personnel completed all repairs to the damaged seismic power cutoff switch and performed the quarterly functional check from technical safety requirements surveillance (see 8/25/2023 report). Following the successful surveillance, the system was declared fully operable.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 3, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: A. Boussouf and D. Gutowski, Resident Inspectors
SUBJECT: Los Alamos Activity Report for the Week Ending November 3, 2023

Staff Activity: A. Boussouf completed his assignment as a Los Alamos resident inspector. He will remain in New Mexico, but report to DNFSB headquarters supporting fire protection engineering needs complex wide. D. Brown was on site to observe personnel from the Waste Isolation Pilot Plant perform a generator site technical review on transuranic waste practices at Area G. The review covered corrugated metal pipe (CMP) activities.

Plutonium Facility–Decontamination and Decommissioning (D&D): A room owner reviewing a D&D work package to sign off on a hold point noticed that not all previous hold points had been signed. The in-progress package supported removal of a glovebox, and the unsigned hold points related to criticality safety and radiological control. Work on this glovebox is currently paused while D&D personnel are reviewing active work packages to identify other missed hold points. They have found many missed signatures and are trying to determine whether actions for hold points have not been completed or whether this is largely an error in documentation. Once this extent of condition is completed, Plutonium Infrastructure management plans to develop improvements to their work planning and control processes.

Plutonium Facility–Radiological Control: On Tuesday, a glovebox worker performing container repackaging detected contamination on their personal protective equipment (PPE) during monitoring immediately after exiting their glovebox gloves. Radiological control technicians responded and found a tear on the right thumb of the glovebox glove. While there was no skin contamination, and appropriate operator actions helped prevent further spread, the level of PPE contamination was quite high. Facility personnel are developing several potential corrective actions including evaluating different tools in the cold lab to reduce pinch and sharps hazards when handling similar container types.

Area G–Operations: While N3B remains in the overall stop work for training issues, major operations at Area G have all been released by senior management (see 10/6/2023 report). Retrieval and cutting of CMPs are progressing with 13 CMPs being fully cut and packaged into standard waste boxes while one CMP is partially cut as of Thursday afternoon. N3B personnel are planning to increase throughput by adding a staggered shift to CMP cutting.

Federal Oversight: On Wednesday, the NNSA Field Office transmitted to Triad its completed assessment of nuclear criticality safety integration into fissile material handler training. One driver for performing this assessment was the large number of new employees going through fissile material handler training. The assessment team identified nine findings and eight observations. Many of the findings relate to traceability of training and retraining requirements. The Field Office requested that Triad perform an extent of condition review of past fissile material handler and supervisor training to identify any deficient training or certification. Within 60 days, Triad must respond to the Field Office with information describing how findings from the assessment and any discoveries from the extent of condition review have been documented in the issues management system.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 10, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending November 10, 2023

Plutonium Facility–Emergency Response: On Monday, there was a flash and a fire in a glovebox in the Plutonium Facility. Workers were pulverizing legacy material from 1983 for introduction into the aqueous chloride line. Upon activating the bonecrusher, there was a flash, followed by flames and smoke in the box. The workers immediately deactivated the equipment, activated dropbox fire alarms, and evacuated the room. All the continuous air monitors in the room alarmed, as did one in an adjacent room. Other workers in the facility performed a controlled egress to assembly areas outside the building. Los Alamos Fire Department personnel responded and found the fire was out when they made entry into the laboratory room where the event occurred. No workers were injured, contaminated, or showed any evidence of a radiological uptake. The likely cause of the energetic reaction was calcium metal contained in the feed material. Engineering personnel have determined that the glovebox is still maintaining negative pressure with respect to the laboratory room but have recommended replacing all filters and gloves as well as glovebox windows closest to the event. Access to the room is still restricted while Triad personnel develop a formal recovery plan. They also entered the New Information process to determine any safety basis implications from this event.

Plutonium Facility–Radiological Control: Management from operations, performance improvement, and radiological control organizations have started a new approach to learning from radiological events. While significant events will still be treated individually and have fact-finding meetings, the new approach involves management evaluating all radiological events over the past week and elevating topics to discuss further during fact-finding meetings, potentially with other similar events. This week, the first fact-finding meetings using this new approach were held. One covered a series of events during decontamination and decommissioning activities on a glovebox that had been used to process heat source plutonium in the past. Some of the events included continuous air monitor alarms, personal protective equipment contamination, and contamination found outside expected areas. Triad is planning to perform a causal analysis to evaluate this series of events to improved glovebox removal processes.

Transuranic Waste Management: This week and last week, Triad completed two mobile loading shipments from Technical Area 55. The shipments included several pipe overpack containers with large amounts of heat source plutonium. Personnel executed a series of moves in and out of the Plutonium Facility during packing these pipe overpacks into standard waste boxes and then into the TRUPACTs. This maintained compliance with all material at risk limits and avoided a repeat of the limit exceedance during the last mobile loading activity (8/25/2023). Longer term, safety basis personnel are developing a change to allow compliant shipping of higher material at risk items without resorting to a series of extra waste movements.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF): Workers completed repairs to the exterior stucco of WCRRF this week (see 10/13/2023 report). This repair does not address the fire rating of the exterior walls. Therefore, the plan to implement a compensatory measure of restricting vehicles with a physical barrier to keep them at least 10 feet from the exterior walls remains in place.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 17, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending November 17, 2023

Staff Activity: M. Bradisse was on site this week providing resident inspector support. A. Boussouf was on site Thursday supporting Mr. Bradisse's visit.

Plutonium Facility–Glovebox Safety: On Monday, workers were preparing to package materials in a glovebox in a laboratory room. While attempting to open an empty container in the glovebox, a worker lost control of the container, which impacted the window between the glovebox gloves they were using. The impact cracked the inner laminated safety glass confinement window and shattered the outer leaded glass window used as radiation shielding. Because of the presence of glass shards, the worker chose to remain in the gloves while another worker sought assistance from radiation control personnel. Upon arrival, radiation control personnel surveyed the cracked window and the glass shards and discovered contamination. Surveys of the surrounding area showed no contamination spread outside the immediate vicinity of the glovebox, so workers were able to package the contaminated shards, affix tape to the cracked glovebox window, and release the room for work later that day. Nasal swabs of the worker in question indicated potential radiological intake, and that individual was placed on special bioassay. At the fact-finding meeting, participants noted that the worker did not use a prying tool to assist with opening the container. Using this tool is an encouraged practice, which workers are trained on, but it is not required. Participants also noted that there is no standard response for a glovebox window breach, like there is for a glovebox glove breach. Potential corrective actions from this event include clarification of the guidance, requirements, and training for pry tools, and clarification and documentation of the expected response to glovebox window breaches.

Plutonium Facility–Safety Basis: On Tuesday, Triad safety basis personnel briefed NNSA Field Office management on the preliminary results of a parametric study of leak path factor during certain accident conditions. The leak path factor describes the amount of radioactive material that escapes the building during accidents and is one of the factors used to calculate the potential dose consequences to members of the public following hypothetical accident scenarios. Once finalized, the results of this report will be used to inform the selection of appropriate leak path factor values for the new documented safety analysis for the Plutonium Facility, which is being developed per DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*. For this study, Triad safety basis personnel created a computer model of the entire Plutonium Facility and simulated one of the current design basis accidents, a fire in a single laboratory room. They then perturbed several conditions, including: the specific room where the accident takes place, the amount of material at risk, the duration of material release, the cumulative time that outer confinement doors and inner laboratory room doors are open, the timing of when those doors are open, the activation of fire suppression systems, and the presence of active ventilation. Triad personnel stated that the preliminary values aligned with expectations and with leak path factor values used in the current documented safety analysis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 24, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending November 24, 2023

Staff Activity: D. Gutowski was offsite this week. M. Bradisse provided coverage remotely.

Area G–Stop Work: While performing an extent of condition review on operational record keeping practices for contact-handled transuranic waste operations at Area G, an N3B team discovered that records management was not in compliance with expectations laid out in the contractor’s policy. The team found that completed pre-job and post-job paperwork was of inconsistent quality and was not regularly undergoing a quality review process, that training and qualification paperwork for individuals performing work was difficult to trace, and that general understanding of expectations for records management was poor. Consequently, N3B management stopped work at Area G. This is the latest in a series of work stoppages at Area G related to deficiencies in paperwork, training, and qualification (see 11/4/2023 report). The team is finalizing a list of findings from the assessment and will develop corrective actions needed to resume work.

Plutonium Facility–Safety Basis: Last Wednesday, the NNSA Field Office approved the evaluation of the safety of the situation (ESS) pertaining to the positive unreviewed safety question for future mission work involving receipt and processing of large shipments of heat source plutonium (see 7/28, 9/1/2023 reports). However, the approval letter noted that the ESS’s operational restriction was vague since it did not clearly specify the affected area of the Plutonium Facility, or that Field Office concurrence would be required prior to introducing this heat source material into any glovebox. The approval therefore included one directed change to clarify these points.

The ESS resolves a discrepancy identified during readiness activities regarding the allowable material at risk (MAR) in a glovebox during these operations by proposing an operational restriction aligned with the lower of two potential MAR values. That lower MAR value corresponded to the dose consequences reported in the initial safety basis addendum. However, the ESS stated that a revised safety basis addendum would be submitted to allow the higher of the two MAR values. The revised addendum, submitted in early September, proposes a further increase in MAR, so it will also need to be approved by NNSA headquarters, as it will involve accepting additional risk to the public on top of the risk already accepted.

Plutonium Facility–Decontamination and Decommissioning: During a walkdown last week, the resident inspectors observed the conditions of an in-progress job to remove a large glovebox from the facility. This glovebox was large enough that it required multiple in-situ cuts to fit it through the laboratory doors. To perform this work, laboratory personnel erected a floor-to-ceiling contamination control tent, which allows the facility fire suppression system to maintain coverage within the tent. They performed the cuts with a method new to the Plutonium Facility. As of last week, the cuts have been performed, the portion of the glovebox to be removed has been wrapped and prepared for removal from the laboratory room, and the opening to the remaining glovebox line has been secured with a metal plate to maintain confinement. The resident inspectors also observed the condition of a smaller box in a different room that had recently been disconnected and was wrapped awaiting removal and identified a contamination control tent in the basement supporting a pump removal that was in disrepair.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 1, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending December 1, 2023

Staff Activity: D. Gutowski was virtually in Washington, DC for the biannual ingathering of the resident inspectors to DNFSB headquarters. A. Boussouf was on site Tuesday and Wednesday providing support.

Area G–Work Planning and Control: On Tuesday, Area G management stopped work on corrugated metal pipe (CMP) retrieval and size reduction due to the identification of an issue with a procedure revision that removed a critical lift plan. Work was already stopped due to the training documentation issues identified two Thursdays ago (see 11/17/2023 report). As loads during size reduction activities can exceed 75% of the maximum rated capacity of lifting equipment, a critical lift plan is required per N3B policy. Several evolutions were completed with the revised procedure, and therefore without an associated critical lift plan. To lift this stop work, N3B management is evaluating either restoring the critical lift plan to the procedure or performing engineering work to eliminate the requirement for a plan for this activity. They are also evaluating whether the procedure development process is adequate and how to improve its effective use.

Plutonium Facility–Safety Basis: Last Monday, Triad personnel concluded that the pyrophoric event in a glovebox constituted a potential inadequacy of the safety analysis (see 11/10/2023 report). While the safety basis includes deflagration events for other processes and gloveboxes, there is no scenario specific to the size reduction process where the flash and fire occurred. Controls for those energetic events in other activities may not apply to this process.

Transuranic Waste Facility–Fire Protection: In early November, fire protection fitters reported water dripping from the fire department connection to one of the waste storage buildings. Further investigation determined that two ball drip check valves on the drain lines for the fire department connection were in the incorrect position. Triad personnel entered the New Information process to evaluate the safety basis impacts on the safety-significant fire suppression system. This Wednesday, safety basis personnel concluded that there was no potential inadequacy of the safety analysis primarily because the drain lines are not part of the safety-significant pressure boundary for the system.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF): On Tuesday, the NNSA Field Office unconditionally approved a safety basis addendum to the current hazard category 2 WCRRF safety basis that supports activities to transition to a hazard category 3 facility. These activities include removal of existing contaminated equipment and practice evolutions for equipment downsizing. WCRRF will remain in cold standby for these activities and no new material at risk will be introduced. On Wednesday, the Field Office acknowledged Triad's plans for reconstituting the facility's code of record (see 10/13/2023 report).

Weather Impacts: A winter storm disrupted laboratory activities on Thursday and caused a delayed opening on Friday.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 8, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending December 8, 2023

Plutonium Facility–Radiological Control: Last Tuesday, a worker alarmed the final set of hand and foot monitors prior to exiting the facility. Responding radiological control personnel identified skin contamination on the individual’s hand and successfully decontaminated them. The contamination was a particle, which are difficult to detect. The worker, wearing a labcoat and booties as personal protective equipment (PPE), had not been performing hands on work but was acting as an escort for carpenters performing preparatory activities for decontamination and decommissioning (D&D) in a laboratory room. During active D&D in this room, additional PPE is required, and the room is subsequently decontaminated to allow labcoat access. The room has had several contamination spreads and PPE contamination events over the past several weeks during active D&D and was the most likely source of the contamination. During this week’s fact-finding for this event, participants identified a broader training concern not directly related to the event. Facility specific contamination monitoring training is not being assigned until personnel meet all security requirements for unescorted access to the facility. Management is evaluating this issue to determine if personnel should take this training while still under escort.

On Monday, there were two related contamination events in the low-level waste area of the basement. The first event involved discovery of contamination on one worker’s PPE. During the next shift a new crew, supported by a radiological control technician, inspected the waste bags that were the probable source of the first contamination. They were unable to find any damage to the bags or contamination; however, three workers discovered PPE contamination during full body surveys, and a continuous air monitor alarmed as they exited the basement. No other personnel in the basement had any contamination detected on their PPE, but there was contamination detected on the low-level waste staging bins. Low-level waste staging, labeling, and bagging practices are under evaluation to help prevent recurrence of this type of event.

Plutonium Facility–Safety Basis: Last week, Triad personnel submitted a revised atmospheric dispersion modeling protocol that will support the new Plutonium Facility safety basis. The new revision is intended to address NNSA Field Office comments (see 10/27/2023 report). The revised protocol asserted that other conservative portions of the dose calculation justify reducing the conservatism of the proposed dispersion calculation. Triad quoted DOE Standard 3009-2014 regarding the use of an alternate dispersion parameter for calculating the co-located worker doses. Additionally, Triad stated that calculating a co-located worker dose to a worker that is not physically at 100 meters is excessively conservative. However, the resident inspector notes that DOE Standard 3009-2014 requires evaluating the co-located worker dose to a receptor at 100 m, unless no viable control strategy exists. In the protocol, Triad did not state which facilities lack a viable control strategy for the co-located worker. Triad said it would provide technical justification, including information on the viability of its control strategy, in facility-specific safety bases.

Area G–Safety Basis: N3B hosted a series of meetings this week to support development of the new DOE Standard 3009-2014 compliant documented safety analysis for Area G (see 8/11/2023 report). Efforts this week focused on development of implementable technical safety requirements and engaging the DOE Office of Environmental Management’s safety basis review team on the same topic.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 15, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending December 15, 2023

Staff Activity: M. Bradisse and R. Wu were on site providing resident inspector support. M. Bradisse also attended the training course *Safety Culture for Front Line Leaders* at the NNSA Field Office.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF)–Radiological Control:

Last Wednesday, there was a skin contamination event at WCRRF. Personnel were working to remove legacy contaminated equipment from the glovebox enclosure, which is highly contaminated and has a legacy hydraulic oil spill. The workers were wearing two pairs of Tyvek coveralls and powered air purifying respirators. One of the workers who entered the enclosure alarmed monitoring equipment on exit after doffing his coveralls. Supporting radiological control technicians identified contamination on the individual's inner elbow. They were unable to successfully decontaminate the skin with the limited techniques allowed and available at WCRRF, so the worker was transported to Occupational Medicine where he was successfully decontaminated. Radiological control, operations, and industrial hygiene personnel plan to re-evaluate personal protective equipment requirements for this activity to better protect the workers from radiological hazards while avoiding heat stress issues.

Area G–Operations: Last week N3B lifted stop works specific to corrugated metal pipe activities and resumed those operations (see 12/1/2023 report).

N3B commenced a management self-assessment for startup of the Universal Drum Assay and Segregation System (UDASS). The UDASS is a new system under evaluation to obtain more accurate characterization of waste drums. As UDASS operations are largely similar to existing assay techniques, this is considered an expansion of existing capabilities, and no formal readiness assessment is planned. This week, the review team observed an operational demonstration and started interviews. The review is expected to conclude next week.

Plutonium Facility–Safety Basis: Last Wednesday, Triad personnel concluded that the energetic event in the bonecrusher constituted a positive unreviewed safety question (see 12/1/2023).

Chemistry and Metallurgy Research Building (CMR): Last Thursday, Triad submitted to the NNSA Field Office for approval a major modification determination for a potential new mission to size reduce mixed oxide fuel rods at CMR. These fuel rods have no defined use and are currently in shipping casks staged in the Plutonium Facility. The proposed project would be to ship the casks to CMR, open them, and size reduce the fuel rods in the Wing 9 Confinement Vessel Disposition enclosure prior to disposal as waste offsite. Triad concluded that this proposed mission would not constitute a major modification, but a safety basis addendum would be required.

Weather Impacts: A winter storm caused a laboratory closure on Thursday and a delayed opening on Friday.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 22, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending December 22, 2023

Waste Characterization, Reduction, and Repackaging Facility (WCRRF)–Emergency

Preparedness: On Tuesday, Emergency Operations Center and WCRRF personnel performed an emergency preparedness drill. As WCRRF is undergoing preparations to restart as a hazard category 3 nuclear facility, the drill used the new emergency planning documents that are still under review by the NNSA Field Office as those reflect the hazards of the facility for its future mission. The scenario was a fire in a storage container adjacent to WCRRF. This event was then complicated by a personal medical condition at a shelter-in-place location and a contaminated individual.

Plutonium Facility–Emergency Response: Last Tuesday, a hazardous material (HAZMAT) team responded to the Plutonium Facility due to a low oxygen alarm. A portable oxygen meter was being used in a laboratory room to support functional testing of a newly installed glovebox. The glovebox is not yet fully connected to radiologically contaminated systems including ventilation and other gloveboxes. The glovebox contains an engineered fluid and a nitrogen powered pump. While the crew was working with the nitrogen system, the oxygen monitor alarmed. The crew exited the area and informed the Operations Center. HAZMAT personnel responded and measured unexpectedly high levels of volatile organic compounds and backed out. After replanning their entry to account for this additional hazard, the HAZMAT personnel reentered and closed all engineered fluid containers in the box. Work in the impacted wing of the facility was placed in a safe configuration, and personnel exited that wing until additional monitoring determined it was safe to return. The impacted box is currently cordoned off while recovery plans are in progress. Facility personnel are planning on improving communication regarding the location of portable monitoring equipment and revising the work document for functional testing of this glovebox to improve industrial hygiene controls.

Plutonium Facility–Emergency Preparedness: On Thursday, the NNSA Field Office conditionally approved a revised addendum to the Plutonium Facility Emergency Planning Hazards Assessment. This document supports the receipt and repackaging of large quantities of heat source plutonium. The addendum accounts for additional material at risk and this revision resolves a discrepancy in allowable material at risk values identified during readiness reviews (see 6/30/2023 report). The safety basis addendum revision supporting this larger material at risk limit is currently under review by a team led by NNSA Headquarters (see 9/8/2023 report).

Legacy Facilities–Safety Basis: On Monday, N3B resubmitted the safety basis for Technical Area 21 to the Environmental Management Field Office for approval. N3B withdrew its previous submittal (see 9/29/2023 report) to improve the documents. The revised submittal does not change the limited scope of work or the two specific administrative controls proposed in the original document.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 29, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending December 29, 2023

Year in Review: A summary of the key developments of 2023.

- A parallel federal and contractor readiness review took place to support the receipt and repackaging of large quantities of heat source plutonium in the Plutonium Facility. These reviews discovered discrepancies in the safety basis and emergency hazards planning assessment regarding the total amount of material at risk allowed. NNSA headquarters is evaluating a revised safety basis addendum that includes a higher amount of material.
- Triad continued to make upgrades at the Plutonium Facility. Major accomplishments this year included the commissioning of two new safety-class diesel fire pumps, commencement of the project to provide a separate fire water supply to non-seismically qualified buildings adjacent to the Plutonium Facility, and replacement of aging air compressors to support the safety-significant instrument air system.
- N3B identified a programmatic breakdown in their training program and instituted a stop work at Area G and Technical Area 21. Senior management has individually released the vast majority of individual work activities, but the training stop work remains in place.
- Corrugated metal pipe size reduction at Area G went through contractor and federal readiness assessments and commenced operations.
- N3B developed and the Environmental Management field office approved a new site-specific atmospheric dispersion protocol to support development of a safety basis compliant with the most current DOE standards for Area G. Triad has also developed an atmospheric dispersion protocol to support a modern safety basis for the Plutonium Facility. The NNSA Field Office is still reviewing Triad's proposed approach and has requested several modifications.
- The Radiological Laboratory Utility Office Building completed the transition to a Hazard Category 3 nuclear facility known as PF-400.
- Preparations to restart the Waste Characterization, Reduction, and Repacking Facility as a hazard category 3 nuclear facility continue. Workers have started entries into the highly contaminated glovebox enclosure to prepare it for future missions. The NNSA Field Office conditionally approved the new hazard category 3 safety basis. Readiness activities are planned for next year.
- DOE's Criticality Safety Support Group performed an assist visit in response to the NNSA Field Office's request to review Triad's criticality safety program. Triad has restructured its criticality safety division under new leadership in response to recommendations from the review.
- The Flanged Tritium Waste Containers stored at Area G are still awaiting venting. Updated pressure calculations and standoff distances have been developed to account for the steadily increasing internal pressures. These will be used to revise the safety basis addenda that will support venting.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 5, 2024

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending January 5, 2024

Area G–Safety Basis: On Tuesday, the Environmental Management Field Office and Headquarters approved the annual update to the Area G Basis for Interim Operations. Additionally, N3B submitted an extension request for the five Justifications for Continued Operations (JCOs) to February 28, 2025, which is currently undergoing DOE review for approval. The five JCOs have been in place since 2021 and cover a variety of topics from the numerous potential inadequacies of the safety analysis identified that year (see 9/3, 10/5, 10/29/2021 reports). DOE guidance recommends JCOs last no longer than 12 months, at which point they should be incorporated into the permanent facility safety basis. These JCO's have been extended to focus efforts on developing a modern documented safety analysis to serve as the safety basis for Area G. DOE's letter states that they are receptive to another extension on the condition that the JCOs will be incorporated into this new safety basis. The new safety basis is expected to be submitted for approval in March of this year with a goal of full implementation before the end of the fiscal year.

Plutonium Facility–Safety Basis: On Thursday, Triad safety basis personnel resubmitted a safety basis page change that would expand the types of allowable activities during limited operations mode at the Plutonium Facility. The driver for this change is to allow more flexibility for removing or installing equipment. Entry into limited operations mode is usually driven by incomplete functionality of credited safety systems (whether planned or unplanned) as defined in the facility's limiting conditions for operations. Therefore, only activities with limited risk are allowed. The NNSA Field Office did not approve the first version of this change last November. The Field Office expressed concerns in its response that there was not adequate detail regarding the justification for new types of activities and the specifics defining the risk threshold for those activities. The new submittal is intended to address these concerns.

Plutonium Facility–Readiness: At the end of last month, Triad requested the NNSA Field Office approve its corrective action plan from the contractor readiness assessment for resumption of aqueous nitrate operations (see 5/5/2023 report). Triad personnel performed causal analyses for each of the five pre-start and three post-start findings from the assessment to develop the suite of corrective actions. Actions affiliated with pre-start findings are either complete or scheduled for completion next week. NNSA personnel are reviewing these submittals and plan to start a federal readiness assessment at the end of January.

Continuous Improvement: The resident inspector met with the Triad Operational Performance Assurance manager to discuss initiatives to improve operations in the Weapons Production and Plutonium Infrastructure directorates.

Weather Impacts: A winter storm impacted laboratory operations with delayed openings on Thursday and Friday.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 12, 2024

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending January 12, 2024

Staff Activity: Staff members P. Migliorini, S. Seprish, and S. Sircar were on site this week providing resident inspector augmentation and gaining perspective on plutonium operations to support design reviews of the Savannah River Plutonium Processing Facility. A. Boussof was on site Wednesday to support their visit.

Plutonium Facility–Radiological Protection: There were two skin contamination events in the Plutonium Facility last week. In one, an individual alarmed hand monitoring equipment while exiting a laboratory room. Follow-up surveys of this room discovered the likely source, a contaminated telephone. The other event involved a hot particle from a heat source room. Follow-up surveys of that room did not discover any contamination. Both individuals were successfully decontaminated. These events along with earlier lower magnitude contamination events are being looked at together to improve processes with the intent of reducing contamination events. Actions in progress include: additional surveys of items, such as telephones, that can be touched without gloves in radiological buffer areas; focused observations in the field by radiological control personnel to observe worker compliance with the facility radiation protection program; evaluating changes to that program especially for personal protective equipment requirements based on observations; and a common cause analysis for recent contamination events.

Plutonium Facility–Safety Basis: The resident inspector and a staff member joined two NNSA facility representatives to walk down the laboratory rooms that will be used for receipt and repackaging of large quantities of heat source plutonium (see 9/8/2023 report). The primary purpose was to provide the NNSA personnel with perspective and background on the safety improvement suggestions included in the Board's letter of August 11, 2022.

Plutonium Facility–Decontamination and Decommissioning (D&D): As part of the Los Alamos Plutonium Pit Production Project D&D efforts, Triad is draining and removing pencil tanks from the facility (see 12/9/2022 report). In December 2023, after installing a hot tap on a pencil tank, operations personnel noticed a small leak on the laboratory room floor. Operators adjusted the hot tap valve and installed a one gallon catch bag over the valve to prevent contamination spread. Criticality safety personnel were alerted and observed that the bag did not contain liquid, but the size exceeded the requirements in what they believed to be the criticality safety posting for the tank. Further investigation of this event determined that the hot tap installation noted above was performed on a tank that did not have an active criticality safety posting. This week, facility personnel held a fact-finding meeting to evaluate these events. Proposed corrective actions include performing fissile material operations reviews for all operations associated with tank removals and better contingency planning for hot tap leaks.

Area G–Operations: On Tuesday, N3B personnel identified that a corrugated metal pipe (CMP) evolution had been completed last week under an expired critical lift plan. Management paused CMP excavation. Workers must check this plan and other command media are valid before performing operations. In this instance, that check did not identify that the plan was expired. N3B plans to perform an extent of condition evaluation on lift plans and other documents to review expiration dates, revise their policy on developing critical lift plans, and evaluate whether this event has overlap with a previous critical lift plan issue (see 12/1/2023 report).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 19, 2024

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending January 19, 2024

Staff Activity: The Board's Executive Director of Operations, M. Buhler, accompanied by staff member P. Migliorini, was on site Tuesday and Wednesday for a familiarization visit. The visit started at the Chemistry and Metallurgy Research Building where Triad personnel led her through Wings 3, 5, and 9 while discussing current missions and risk reduction efforts. Senior leadership from the Environmental Management field office and N3B then led a tour of Area G which primarily covered the corrugated metal pipe excavation site and cutting activities in Dome 375. They also discussed organizational interfaces in the transuranic waste mission and the recent progress involving N3B training issues. Next was a visit to Triad's RANT Shipping Facility where Triad and N3B personnel discussed waste shipments and how they share the facility's capabilities. On Wednesday, Ms. Buhler went to Technical Area 55. Triad personnel discussed safe glovebox operations and training for the growing workforce in a cold lab. An exterior walk around the Plutonium Facility pointed out key safety systems such as fire pumps, instrument air, and the uninterruptible power supply. In the Plutonium Facility, the tour included entries into rooms associated with pit production, an overview of the heat source and plutonium disposition missions, and a visit to the basement focused on safety systems like the ventilation system. Ms. Buhler also met with both the NNSA and Environmental Management field office managers.

Plutonium Facility–Safety Basis: On Tuesday, the NNSA Field Office provided Triad with formal comments on a safety basis submittal that proposed limitations on fires inside certain gloveboxes to avoid the scenario where an internal glovebox fire actuates the fire suppression system, and damage to the glovebox allows water ingress and potential moderation of fissile material. This is a long-standing issue (see 3/21/2014 report) as many gloveboxes do not have criticality safety evaluations that account for flooding of the glovebox. These boxes must either be analyzed to show they are safe if moderated by flooding or flooding must be incredible.

Seismic Hazard Analysis: On Thursday, Triad personnel briefed NNSA Field Office and DOE headquarters subject matter experts on progress collecting data to support the new site probabilistic seismic hazard analysis.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 26, 2024

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending January 26, 2024

Staff Activity: On Tuesday, the Board's staff held a remote factual accuracy meeting for a complex-wide review of electrical cable maintenance (see 6/23/2023 report).

Plutonium Facility–Infrastructure: At the end of last year, Triad issued the annual revision of the TA-55 Project Execution Strategy (PES) (see 1/6/2023 report). Key accomplishments in the last fiscal year highlighted in the latest PES include: completion of phase 2 seismic testing of cast-iron fire suppression system fittings, completion of six seismic cluster analyses for gloveboxes, and completion and commissioning of the new Facility Control System. Major activities planned for this fiscal year include: completing the construction of a new high pressure fire water feed for the non-seismic building separation project, completing the design for fan replacements for Zone 1 exhaust and Zone 2 bleed-off, completing six more seismic cluster analyses for gloveboxes, and completing the construction and commissioning of two instrument air system compressors.

Plutonium Facility–Safety Basis: This week, the NNSA Field Office transmitted to Triad its response on the leak path factor and atmospheric dispersion methodology. The field office did not concur with the revised methodology and directed Triad to use the currently approved one. The field office previously submitted comments regarding the justification for the overall reduced conservatism in the proposed calculation (see 10/27/2023 and 12/8/2023 report).

Plutonium Facility–Readiness: On Thursday, the NNSA Field Office approved the corrective action plan from the contractor readiness assessment for resumption of aqueous nitrate operations (see 1/5/2024 report). The federal readiness has been postponed due to an equipment issue identified this week.

Transuranic Waste Facility (TWF)–Criticality Safety: On Tuesday, Central Characterization Project (CCP) personnel were performing drum measurements at the High Efficiency Neutron Counter at TWF. Their initial measurements exceeded the 200 fissile gram equivalent criticality safety limit for three 55 gallon drums at TWF. Under their normal practice, CCP tags these drums to note the high initial reading, but does not report the values until they are validated through expert analysis and adjusted to account for instrument uncertainties. TWF operations personnel noted the tags and entered their criticality response process. The final validated value on all of these drums was below the 200 gram limit. Waste generator data from when the drums were originally received at TWF from Technical Area 55 also showed they were below the limit. Triad and CCP personnel plan to ensure that there is a consistent understanding of which types of data are appropriate to use for criticality safety compliance at TWF. There is an existing memorandum from the Nuclear Criticality Safety Division from 2011 that is referenced in the TWF criticality safety evaluation. This memorandum recommends using waste generator data for criticality safety compliance for transuranic waste operations in Area G as opposed to the practice at the time that initially used waste generator data then flipped to validated assay data from CCP.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 2, 2024

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending February 2, 2024

Staff Activity: M. Sautman was on site to evaluate resident inspector performance.

Plutonium Facility–Safety Basis: Last week, an NNSA facility representative questioned whether damage ratios were being appropriately applied when SAVY containers for nuclear material have hermetically sealed caps over their vents. These caps can be used to keep an inert environment in the container to protect the contents. SAVY containers have been tested in the uncapped configuration to provide a 1% damage ratio in specified fire and drop accident scenarios. However, the capped configuration has not been tested, and thus no damage ratio can be applied to a capped container. In many situations, these capped containers are being improperly credited with a damage ratio. Facility personnel entered the limiting condition for operations pertaining to container configuration in the room this was discovered in. Following resolution there, an extent of condition review found additional problems in other rooms leading to limiting condition for operations entries. All containers with caps are currently being evaluated to determine how they have been listed in the software that tracks nuclear material. In the long term, Triad is planning to implement software changes to ensure these types of containers are tracked properly and are not credited with damage ratios. Existing plans to test SAVY containers in the capped configuration to see if a damage ratio can be applied are on hold pending resource availability.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF): Workers performing HEPA filter changes for the confinement ventilation system in WCRRF discovered that they were using the wrong model of filter. The new filters were not fitting properly into the housings, and after using more force than expected on several installs, the workers noted the discrepancy. Engineering personnel are evaluating whether the filter housings were damaged by the process of forcing in the incorrect filter model. The confinement ventilation system is credited as a safety-significant system in the current hazard category 2 safety basis, but is not required to be operational in cold standby mode, which is the current facility condition. The safety basis currently in development for the upcoming transition to hazard category 3 operation does not credit this system.

Area G–Operations: On Wednesday, the resident inspector and visiting staff member observed corrugated metal pipe size reduction activities in the Dome 375 Permacon. While performing rounds within the Permacon, a worker identified that one of the portable HEPA filter units was not operational. An examination of the power supply discovered a tripped breaker and thermal damage to a power cord. The work team appropriately paused work and made notifications.

Federal Oversight: Two individuals from the NNSA project management office went through final senior technical safety manager qualifications this week. Personnel from the NNSA field office acted as the qualifying officials. The field office has recently started developing alternative approaches to the traditional formal oral board approach for final qualifications. These involve a combination of discussion and field walkdown with more emphasis on the candidates volunteering knowledge rather than answering specific questions. The resident inspector and visiting staff member provided feedback on improving this approach.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 9, 2024

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending February 9, 2024

Staff Activity: M. Bradisse was on site providing resident inspector support. While on site, he attended fact-finding meetings, toured the Weapons Engineering Tritium Facility to discuss the safety implications of an upcoming mission, and made several entries into the Plutonium Facility.

Plutonium Facility–Decontamination and Decommissioning (D&D): Last Wednesday, Plutonium Infrastructure personnel discovered several issues in a room undergoing D&D activities. This room contains legacy gloveboxes, which workers are cleaning and preparing for eventual removal. Workers discovered that while some gloveboxes in the room had the correct version of the required criticality safety posting, other gloveboxes had a previous version that should have been replaced. Additionally, the workers discovered that two drums in the room had separate issues. The first drum had a specific criticality safety posting that meant it was not allowed in this room. The second drum had conflicting labels, such that it was marked as both as “empty” and “in progress” despite containing nuclear material. The workers also discovered discrepancies with material inventory printouts on several pencil tanks, which are staged for size reduction. At the fact finding, workers stated that, during one work evolution, they were running low on battery power for their respiratory equipment, which caused them to exit rapidly and miss the conflicting labels on the second drum. Corrective actions for this event include developing a lessons-learned document, and evaluating techniques for displaying criticality safety posting techniques to ensure such postings are replaced with current versions when necessary and avoid inadvertently introducing disallowed items into areas.

Last week in a different room, there was a continuous air monitor alarm in a contamination control tent supporting D&D work. There was no active D&D work occurring at the time; rather, personnel were smoke testing the tent to test for adequate ventilation flow. All personnel in the tent evacuated. Personnel in the laboratory room, but outside of the tent, also evacuated due to an announcement from the operations center. Further airflow measurements concluded that for large tents like this one, there can be a stagnant air layer that allows contamination to collect on elevated surfaces which can then be mobilized when the airflow changes. Additional filtered vents added near the top of this tent resolved this issue without the need for an additional air mover. This approach will be applied to future large tent installations. Another corrective action is to improve communications regarding the location of alarms to avoid unnecessary evacuations without radiological survey for personnel who are already one airspace away from the alarm. Unrelated to the airborne event, a management walkdown of this tent last week identified several housekeeping issues that were promptly resolved.

Federal Oversight: Last week, the NNSA Field Office transmitted to Triad an assessment of nuclear safety issues at the laboratory from the DOE Office of Enterprise Assessments (DOE-EA). The letter requested that Triad address the findings, deficiencies, and opportunities for improvement from the report. The report noted considerable improvement in issues management since the last DOE-EA assessment in 2019. It identified two findings related to persisting weaknesses: that Triad does not adequately identify items that do not meet requirements or need improvement, and that Triad does not adequately train and qualify its workforce on identifying and resolving issues. There were also several deficiencies and opportunities for improvement identified for Triad and one deficiency for the NNSA Field Office: that the field office has not performed assessments of the contractor assurance system.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 16, 2024

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending February 16, 2024

Staff Activity: M. Bradisse was on site providing resident inspector support. E. McCullough was on site for familiarization with transuranic waste activities to support her role as the Board's cognizant engineer for the Waste Isolation Pilot Plant. This included visits to Area G, the RANT Shipping Facility, and the Plutonium Facility.

Plutonium Facility–Radiological Control: Last Wednesday, two workers were cleaning out containers used for ball-milled heat source plutonium. The process involves emptying the bulk contents into a catch pan and then using a wire brush to scrub out the remaining material from the inside. The first worker entered the gloves to demonstrate an action (without manipulating actual objects in the box) and then exited the gloves. That worker then performed a routine glove examination to check for damage and surveyed their hands for contamination on a nearby monitor. The second worker then entered the gloves and performed cleaning actions. When finished, they also performed the routine glove examination, did not note any issues, and exited. This time, however, the worker alarmed the hand monitor at the glovebox and called for radiological control personnel. The worker had contamination on the personal protective equipment on both hands and forearms but was successfully decontaminated. There was no skin contamination. Radiological control personnel later determined that the breach was due to cracking on the tip of the right thumb, which was the hand the employee used to hold the wire brush during cleaning. The glove will be sent for forensic analysis to help determine the cause of the breach. Photographs of the glove breach shared at the fact-finding meeting showed significant blackening, embrittlement, and some visible cracking, despite the glove being installed last November and having not been used for work until last week.

Plutonium Facility–Safety Basis: On Monday, the NNSA field office transmitted a letter to Triad that did not approve the revised safety basis addendum supporting receipt and repackaging of large quantities of heat source plutonium (see 10/6/2023 report). The field office provided a set of comments on the addendum and requested that Triad resubmit the addendum within 30 calendar days to address these comments. One key comment from NNSA stated that Triad should refine its safety analysis to better demonstrate the efficacy of its safety control strategy for glovebox fires.

Area G–Emergency Response: Last Friday, a worker in Dome 375 at Area G smelled and then saw smoke coming from an electrical outlet. They immediately notified the operations center who called the fire department and the Emergency Operations Support Center. The worker used a dry chemical extinguisher on the outlet before evacuating with other personnel to the assembly area. The fire department confirmed that there were no active heat sources. The cause of the event was a single circuit with two space heaters plugged in. The breaker did trip. N3B personnel are performing an extent of condition on space heater usage in domes. Heaters are used in winter to protect fire protection systems from freezing and to provide warming stations for workers.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 23, 2024

TO: Katherine R. Herrera, Acting Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending February 23, 2024

Staff Activity: On Tuesday, a staff team held a remote interaction with personnel from both the NNSA Field and Project Management Offices to discuss federal review and approval of limited procurement and construction activities requests. This is part of a staff review that also includes capital asset projects at other NNSA sites.

Plutonium Facility–Readiness: A federal team commenced a readiness assessment to evaluate the aqueous nitrate process in the Plutonium Facility (see 1/26/2024 report). This process has been shut down since 2013 and is the last major processing operation in the facility that has not resumed since the 2013 director’s pause. A vigorous readiness assessment for the aqueous nitrate process is particularly important as the nature of aqueous processes presents criticality safety challenges that operations with primarily solid materials do not. This week, the team observed simulated field demonstrations of the ion exchange and calcination processes. They also performed numerous personnel interviews. The assessment will continue next week with additional field demonstrations and interviews.

Legacy Facilities: On Tuesday, the Environmental Management field office and headquarters conditionally approved the new hazard category 2 safety basis for 21-257 and the industrial waste lines in Technical Area 21 (see 12/22/2023 report). The one condition of approval was to ensure that the first annual update of the safety basis include a description of any industrial waste lines remaining east of 21-257. In August 2020, N3B declared a potential inadequacy of the safety analysis following sampling results that indicated that these facilities, which were being prepared for decontamination and decommissioning as radiological facilities, may have enough material at risk present to be nuclear facilities that need coverage by a documented safety analysis. The newly approved safety basis authorizes non-destructive assay, sampling, debris removal, surveillance, and maintenance. Further decontamination and decommissioning activities will be covered under a new safety basis to be developed based on sampling data obtained under this safety basis.

Area G–Criticality Safety: On Tuesday, N3B management paused corrugated metal pipe size reduction activities following a question as to whether use of water in a sprayer bottle was evaluated in the nuclear criticality safety evaluation. The criticality safety evaluation for this process evaluates a fully flooded condition, but there is no specific analysis of use of a spray bottle. The water spray is used to help control airborne radioactive contamination generated during the cutting process. Management released the pause on Thursday following an initial assessment from criticality safety personnel stating that use of water spray was acceptable. Longer term, criticality safety personnel are revising the criticality safety evaluation to include contamination control methods using water and proposed future usage of water with fixative. Criticality safety personnel will also perform the annual fissile material operations review of this process early.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 1, 2024

TO: Timothy J. Dwyer, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending March 1, 2024

Staff Activity: On Wednesday, a staff team held a remote interaction with personnel from Triad and the NNSA Field Office to discuss maintenance of safety related batteries. This is part of a multi-site staff review that also includes Lawrence Livermore National Laboratory and the Savannah River Site.

Plutonium Facility–Readiness: The federal readiness assessment for aqueous nitrate operations continued this week (see 2/23/2024 report). The team conducted additional personnel interviews and observed simulated evolutions for oxalate precipitation, evaporator operations, and dissolution. The oxalate precipitation demonstration included an operational drill involving a line plugged with solid oxalic acid. The one major sub-process not fully demonstrated during this assessment is the cementation process which creates cemented transuranic waste drums. That was included in the contractor readiness assessment last year and three waste drums were produced in 2018 under a limited safe and stable campaign (see 11/9/2018 report).

Plutonium Facility–Glovebox Safety: Two weeks ago, workers reported unusual degradation of their glovebox gloves; the gloves appear blistered. After further investigation, it appears that the degradation was caused by soft plastic tubing from recent procurements coming into contact with the gloves. Glovebox gloves are secured outside of boxes when not in use with clamps or are tied together to reduce time spent in the more degrading glovebox environment. Short segments of tubing are placed over the arms of the clamps to reduce the possibility of the metal clamps pinching and damaging the gloves. This technique has been in widespread use for years with no identified issues. Facility personnel are ensuring that all plastic tubes from recent batches are being removed from contact with glovebox gloves. Tubing from old procurements, where no issues have been identified, is still allowed, as is tying off the gloves. Chemical analysis is in progress to better determine what is causing this degradation. Personnel are also analyzing whether there is an impact to plastic waste bags.

Waste Characterization, Reduction, and Repackaging Facility (WCRRF): Last week, facility personnel completed the removal of the lift table from the glovebox enclosure in WCRRF. This was a challenging, high-hazard activity in an airborne radioactivity area/high contamination area. Following the skin contamination event in December (see 12/15/2023 report), the outer layer of personal protective equipment was changed to a less permeable product. While this increased the heat stress challenges of the job, no other major radiological control events occurred during completion of the lift table removal. Personnel are continuing to clean the glovebox enclosure. They are also evaluating the best way to size reduce gloveboxes in the enclosure once WCRRF is restarted as a hazard category 3 facility.

PF-400: The resident inspector joined management on a routine safety walkdown of laboratory spaces in PF-400. Housekeeping and combustible control remain excellent in this facility compared to older nuclear facilities on site.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 8, 2024

TO: Timothy J. Dwyer, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending March 8, 2024

Staff Activity: M. Bradisse and M. Dunlevy were onsite providing resident inspector support. While onsite they met with safety basis personnel regarding proposed changes to allowable operations during limited operations mode at the Plutonium Facility, and with transuranic waste personnel to discuss changes to the enhanced chemical compatibility evaluation process. A staff team provided an outbrief to Triad and NNSA Field Office Personnel regarding the results of their review of the overall health of nuclear criticality safety programs at Los Alamos National Laboratory, the Savannah River Site, and the Y-12 National Security Complex.

Plutonium Facility–Readiness: Last Friday, the federal readiness assessment team reviewing restart of aqueous nitrate operations concluded its assessment activities and provided a briefing to site personnel regarding their preliminary conclusions (see 3/1/2024 report). They identified six prestart and eight poststart findings. The prestart findings related to criticality safety postings, approved waste processes for nitrated materials, and fire protection.

Area G–Radiological Control: On Wednesday, a radiological control technician identified contamination on a standard waste box (SWB) that had recently been moved into Dome 153. The SWB originated in the Dome 375 Permacon as part of corrugated metal pipe size reduction operations. Workers had not performed the required radiological surveys upon removing the SWB from the contamination area in the Permacon. The informal communications methods used during shift turnover appear to have been a major contributor to this omission. Facility personnel posted Dome 153 as a contamination area and performed additional surveys of that dome and other SWBs coming from Dome 375. They identified no additional contamination. As an immediate corrective action, radiological control personnel implemented a logbook to track surveys out of the contamination area.

Emergency Management: On Thursday, site personnel conducted an emergency preparedness drill at the Emergency Operations Center. The scenario was a lightning induced wildfire starting in Technical Area 14 near a high explosive firing site. Simulated meteorological conditions had the fire traveling north near underground potential release sites on a path leading to eventual collision with the high density of personnel and nuclear facilities in and around Technical Area 55. Key aspects of the drill included evaluating optimum evacuation timing for different parts of the laboratory, coordinating airspace usage for simulated airborne firefighting assets, and evaluating hazards from potential release sites for local and supplemental fire-fighting personnel.

Weapons Engineering Tritium Facility: On Tuesday, a valve failed to close during maintenance on a non-safety related air drier system. This led to a brief loss of operability of the safety-significant Tritium Monitoring System. Facility personnel entered the appropriate limiting condition for operation and performed all surveillances to confirm system operability and exit the condition. No personnel were performing tritium operations while the system was inoperable. Safety basis personnel entered the new information process for this event.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 15, 2024

TO: Timothy J. Dwyer, Technical Director
FROM: D. Gutowski, Resident Inspector
SUBJECT: Los Alamos Activity Report for the Week Ending March 15, 2024

Plutonium Facility–Operations: Last Thursday, workers accidentally placed a piece of equipment that had been removed from a laboratory room on the pressure plate for a decontamination shower. The shower actuated and water flowed until it overflowed the shower berm, migrated into a contaminated pump room, and started seeping through the walls and floors into adjacent rooms and the basement. The impacted locations were posted as contamination areas and are being decontaminated. There have been several other high impact inadvertent water flow events in the Plutonium Facility over the past few years (see 3/17/2023, 7/23/2021, 4/2/2021, 11/30/2018, 3/16/2018 reports).

Facility personnel determined that the newly installed glovebox that contains high levels of volatile organic compounds may be a flammability concern (see 12/22/2023 report). The box has been isolated since the hazardous materials response last year and may contain levels of organic vapors that would create a flammable atmosphere if mixed with air. Facility personnel are developing a recovery plan to safely connect the box to the ventilation system and purge the organic vapors. Meanwhile, safety basis personnel have entered the new information process to determine whether this condition is covered in the facility's safety basis.

Area G: Last Thursday, a radiological control technician (RCT) inadvertently removed radioactive survey smears from site. The smears were bagged, and the outer bags were surveyed prior to removal from the contamination area in the Dome 375 Permacon. Last Friday, another RCT called the first one to locate these smears for counting. They then realized the smears had been left in a vest pocket and removed from the site in a personally owned vehicle. DOE's Radiological Assistance Program team was activated to recover the material from offsite. They found that the smears remained in the bags and found no evidence of any contamination spread.

N3B personnel reviewing potentially energetic containers to support the new safety basis discovered that a standard waste box had been moved from Dome 33, where potentially reactive drums are segregated, to Dome 232 in April 2023. This standard waste box is listed in the Justification for Continued Operations (JCO) as requiring additional controls as it contains potentially reactive drums. N3B personnel determined that the move in April 2023 was done without complying with the additional controls in the JCO for moving potentially reactive containers. They have developed a plan to return the drum to Dome 33 using all required controls as soon as possible.

Plutonium Facility–Safety Basis: On Thursday, Triad submitted a revised safety basis addendum supporting receipt and packaging of large quantities of heat source plutonium to the NNSA Field Office. This revised addendum is intended to address recent comments from the field office (see 2/16/2024 report). If approved, this addendum will close out the current evaluation of the safety of the situation in place for these heat source rooms and support the planned receipt and repackaging activity.