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Special Report

NNSA's Management of the \$245 Million Nuclear Materials Safeguards and Security Upgrades Project Phase II

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MEMORANDUM FOR THE SECRETARY

FROM: 
Gregory H. Friedman
Inspector General

SUBJECT: INFORMATION: Special Report on "NNSA's Management of the \$245 million Nuclear Materials Safeguards and Security Upgrades Project Phase II at Los Alamos National Laboratory"

BACKGROUND

The National Nuclear Security Administration's Los Alamos National Laboratory (LANL) is responsible for the protection and control of a significant portion of the Nation's special nuclear materials. Los Alamos National Security, LLC (LANS) is the management and operating contractor for the Laboratory. To address aging security infrastructure, NNSA is now in the final phase of a project to upgrade security at the Laboratory's Technical Area-55, a facility that houses high-security plutonium assets and operations. These upgrades, known collectively as the Nuclear Materials Safeguards and Security Upgrades Project - Phase II (NMSSUP), began in 2009. While LANL retained the option to perform some work, it divided the bulk of the project into five firm-fixed price subcontracts that were awarded to one design company and three construction contractors. Due to favorable contract bids in April 2011, NNSA reduced the estimated total project cost from \$245 million to \$213 million. The project, which consisted of more than 2,200 scheduled activities, was expected to be completed in January 2013.

In September 2012, LANL issued stop work orders to contractors due to ongoing quality concerns with construction, and on October 23, 2012, suspended work on the project due to its inability to complete it within budget. In January 2013, LANL submitted a revised estimate to NNSA that increased the total project cost to \$254 million and extended project completion to December 2013. Subsequent to its submission of the revised estimate, and as part of a settlement agreement, LANS agreed to reimburse NNSA \$10 million in unallowable project costs. NNSA approved the incremental funding required to complete the project in January 2013, and work resumed.

Because of the importance of NMSSUP to the security of LANL's nuclear materials and the significant cost involved, we conducted a special review to determine the underlying reasons that the project was not completed within cost and schedule.

RESULTS OF AUDIT

Our review revealed that the NMSSUP suffered from a number of project management weaknesses. These issues ultimately resulted in cost increases of as much as \$41 million and

delayed completion of the project by nearly a year. Specifically, neither NNSA nor LANL had ensured that:

- Work scope was fully and accurately planned. In particular, LANL contracted for construction work based on designs that either did not reflect actual site conditions or were incomplete. For example, LANL awarded a contract in 2010 to construct a North Security Fence without ensuring that the design reflected up-to-date site conditions. A 2007 site survey determined that there was sufficient supporting soil to construct the fence. However, the land subsequently eroded due to environmental conditions after the completion of the survey and LANL had not updated the subcontracted design. To address this issue, LANL authorized the construction of a retaining wall. After construction began, project officials discovered that they had failed to identify that the retaining wall foundations were in the path of an existing radioactive liquid waste line. As a result, an additional retaining wall was required. The additional, unplanned retaining wall increased project costs by \$11.7 million.
- Construction contractors were required to promptly correct inferior work. During our review we observed and learned from LANL officials of many examples of substandard work performed by construction contractors. These deficiencies included the failure to install rebar dowels that tie one section of poured concrete to the next and several quality problems related to fencing. Fencing problems included problems related to post spacing, post alignment, post-hole centering, height of concrete crowns, and grading for drainage.
- Management systems provided a transparent, clear and consistent view of the project's schedule and cost performance. LANL's schedule was not accurate or fully integrated and as a result, the schedule masked the impact of project delays by assuming unrealistic future performance. For example, the project's December 2011 schedule reported that it would complete the remaining scope of work in 47 percent less time than the original timeline. Given that the project had already experienced a negative schedule performance trend, this level of performance appeared to be highly unlikely and should not have been relied upon. In fact, it was not sustained. Similarly, the project's Earned Value Management System (EVMS) cost and schedule performance metrics consistently reported satisfactory performance and showed no indication that the project would exceed its authorized schedule and budget.

In addition, management information systems failed to provide accurate and complete information about the funds available to complete the remaining work scope. For example, although Los Alamos Field Office officials were aware of the large potential liabilities and cost overruns that were likely to require contingency funds, action was not taken to report the combined impact to the NNSA Administrator in a timely manner. NNSA stated that the amount of contingency reported to the Administrator was based on automatically generated approved baseline changes that could take several months to be reflected in the reporting system. We found that approved baseline changes did not include potential liabilities and cost overruns, and as such, were not reflected in reported amounts of available contingency funds.

According to a Department subject matter expert on contingency, the actual amount of available contingency should have been adjusted to reflect potential liabilities and cost overruns. Such

adjustments to contingency funds ensure that sufficient contingency funds are available to avoid exceeding project funding levels. Further, NNSA stated that the Administrator was informed about additional costs projected from trends and project risks that were not reflected in contingency. However, we found that periodic briefings to the Administrator had not disclosed that there was a potential funding shortfall until May 2012, 4 months before LANL issued a stop work order. If information on the effect of potential liabilities and cost overruns had been disclosed earlier, NNSA may have been able to take action to avoid the project shutdown a year later.

Project Management

Project management weaknesses occurred or continued to exist despite being identified at several levels because: (1) key management officials were not qualified or authorized to take prompt action; (2) the Los Alamos Field Office and LANL failed to take effective corrective actions to address numerous assessment findings; (3) LANL failed to hold its contractors accountable; and (4) NNSA and LANL did not have accurate management reporting systems.

Project Staffing and Authorities

The Los Alamos Field Office did not staff the NMSSUP for successful project execution and did not provide sufficient authority to the Federal Project Director to correct LANL performance concerns. Specifically, NMSSUP's \$245 million total project cost required that the Federal Project Director have a Level-3 certification in project management; however, the Los Alamos Field Office assignee lacked the necessary certifications to manage a project of NMSSUP's size. Since 2008, several project reviews and management reports identified this as a concern. Although NNSA stated it expected appropriate certification by June 2011, it did not occur.

In addition, the Federal Project Director did not possess the Contracting Officer's Representative authority necessary to direct LANL to take corrective actions. This was based on a local Los Alamos Field Office practice to limit the number of Federal employees providing official direction to LANL. Without contractual authority, the Federal Project Director was unable to direct LANL to correct problems, such as those related to quality, without enlisting the help of other NNSA officials. Moreover, several NNSA reviews as early as September 2009, identified this lack of authority as adversely impacting the Federal Project Director's ability to direct LANL in project performance.

Instead of the Federal Project Director, Contracting Officer authority was assigned to a senior Los Alamos Field Office official, who was not in a position to effectively monitor the project. As the NMSSUP Contracting Officer's Representative, it was the senior Los Alamos Field Office official's responsibility to provide written direction to LANL to correct problems, such as those related to quality. However, the senior official provided us with only one written memorandum to LANL that formally communicated performance issues. In fact, a March 2012 Peer Review observed that the senior official did not appear to be actively engaged with the day-to-day activities of the project. The senior official had numerous other responsibilities in addition to NMSSUP and could not redelegate his authority. He told us he relied on the Federal Project Director to provide the LANL performance concerns requiring his attention. According to NNSA management, problems with the Federal Project Director authority and certification continued until a high-level organizational realignment reassigned the Federal Project Directors

to NNSA's Office of Acquisition and Project Management (APM). Upon enactment of the reorganization, APM immediately appointed a properly certified Federal Project Director with formal Contracting Officer's Representative authority and more direct access to both NNSA management and the NMSSUP Contracting Officer.

Contractor Assurance

We also found that LANL's Contractor Assurance System (CAS) failed to provide management with an accurate report on the NMSSUP project. Specifically, the CAS consistently reflected satisfactory project performance, contrary to the actual project performance and project assessments by Department personnel. This was directly analogous to the situation we observed during our review of the security breach at the Y-12 National Security Complex, *Inquiry into the Security Breach at the National Nuclear Security Administration's Y-12 National Security Complex* (DOE/IG-0868, August 2012). In that instance, we observed that Y-12 National Security Complex provided similar positive CAS reports preceding the security incident at that site. As we noted in our review on contractor governance, *Audit Report on the National Nuclear Security Administration Contractor Governance* (DOE/IG-0881, February 2013), weaknesses in the application of NNSA's chosen contractor governance model created an environment in which contractor problems identified at the site level were not effectively communicated to senior management officials. Federal officials came to understand that they were permitted to observe but not direct, the so-called "eyes on, hands off" approach, and could not require contractors to correct known security deficiencies. In this case, we observed that while LANL developed a CAS process, the target metrics selected for cost, schedule, risk and quality failed to provide proactive indicators of risks in these areas. In fact, an August 2012 Los Alamos Field Office CAS Project Execution assessment stated there was not a clear consensus on how the targets for each criterion were developed.

Corrective Actions

The lack of proper staffing, clear lines of authority and engagement of Federal officials contributed to an environment in which effective correction of disclosed problems could not be ensured or validated. Consistent with this environment, we noted that effective corrective actions had not been taken by the Los Alamos Field Office and LANL to address project management issues identified in numerous independent assessments. For example, the Office of Defense Nuclear Security sent a May 2010 memorandum that raised concerns to the Los Alamos Field Office regarding the project. The memorandum expressed concern that the Federal Project Director had brought the issue of design deficiencies, among other things, to the attention of the NMSSUP project team; however, effective resolution had not been achieved. The Office of Defense Nuclear Security stated that it was relying on the Los Alamos Field Office to support the Federal Project Director. Although LANL prepared a corrective action plan to address the concerns of the Office of Defense Nuclear Security, we question the effectiveness of the planned corrective actions and the Los Alamos Field Office's oversight activities given the overwhelming evidence that the problems outlined in the May 2010 memorandum were not adequately addressed.

For its part, LANL also failed to adequately respond to identified findings and concerns about the project. For example, LANL did not adequately address NNSA Headquarters and independent review concerns regarding the lack of an integrated construction schedule necessary

to coordinate work between the various design and construction contractors. As early as May 2010, NNSA Headquarters officials expressed concern regarding the lack of proper construction sequence planning that was impacting construction and other activities. LANL expressed the belief that its summary schedule of the contractors' individual schedules achieved the purposes of an integrated schedule. Yet, we found that the summary failed to identify the cascading effects of delays between contractors as would have been revealed by a fully integrated schedule. As of July 2013, NNSA officials told us LANL still did not have an accurate, resource-loaded, fully integrated schedule.

Similarly, LANL failed to address independent review findings that it approved baseline change control proposals without a definitive scope, budget and schedule. According to a January 2011 peer review, multiple proposals had no supporting documentation, loosely defined scopes of work, and that they were inappropriately used by project officials to expedite the authorization of new work. The review also noted these baseline change proposals were not processed in a timely manner and were rarely seen or approved by the Los Alamos Field Office.

Contractor Accountability

Additionally, we found that LANL had not taken appropriate actions to hold subcontractors accountable for substandard work. Although LANL Subcontractor Technical Representatives, security officials, quality assurance personnel and inspectors reported quality problems to management and the contracting administrator, we were unable to find any evidence that payment was withheld based on quality issues. According to a LANL Contract Administrator, LANL did not withhold payments for quality issues and did not have a policy or procedure for withholding payment for non-conformance with quality standards beyond the standard 10 percent retention clause included in subcontracts.

Management Reporting

Finally, LANL's CAS consistently reported satisfactory project performance even though NNSA's and the Department's assessments indicated that the project was in jeopardy. We found that this inconsistency was directly tied to LANL's choice of using performance targets that were easily achievable and/or did not predict or satisfactorily address emerging problems. NNSA officials told us they were aware of the inconsistencies in the project performance reports; however, data inaccuracies prevented them from knowing the extent of the problems. Several NNSA assessments identified issues with the accuracy schedule data throughout the project and concluded that LANL's system to measure project performance was suspected and as such, may not have been a good indicator of project performance. In fact, a June 2013 EVMS Review concluded that LANL did not maintain and implement its approved EVMS as required by Department Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*. The report stated that due to lack of data quality, LANL's EVMS data should not be relied upon to make meaningful management decisions.

Project Impacts

These project management issues created a series of problems that collectively resulted in significant unanticipated cost and schedule impacts. LANL estimated that project management,

suspension, compensatory security measures, and additional contingency costs would exceed the project's approved budget. As a result, the project will be delayed approximately 1 year and will require an additional \$41 million more than anticipated to complete.

Although it failed to take effective action to address project management weaknesses in NMSSUP, the Department implemented detective controls that identified many of the issues in this report and are key tools for holding Department contractors accountable for their performance. Specifically, the Department implemented the Project Assessment and Reporting System (PARS II), which is the Department's official "System of Record" for capital asset project performance information. PARS II includes analytical tools such as the schedule dashboard and the duration index. This index actually identified the unrealistic future schedule performance required to meet NMSSUP schedule milestones. Furthermore, the Department's Office of Acquisition and Project Management, NNSA's APM, and the Los Alamos Field Office conducted over 10 Project, EVMS and CAS reviews on NMSSUP since 2008. These reviews along with PARS II assessments consistently identified project management concerns regarding cost, schedule and EVMS reporting, as well as project staffing concerns. NNSA officials acknowledged that, even though they received output from these systems, adequate action was not taken to resolve the issues identified over the project's life cycle.

NNSA had taken a number of positive actions to hold LANS accountable for lack of performance. For example, from 2010 to 2012, NNSA reduced LANS' at-risk fee by \$22 million. Also, shortly after the project was suspended, NNSA took action to hold LANS responsible for the cost overruns and other project management shortcomings. In October 2012, NNSA's APM chartered a cross-functional NNSA team that led to a negotiated settlement with LANS of \$10 million toward unallowable project costs. NNSA's APM also made changes to the project team lead Federal Project Director as part of a broader reorganization within NNSA to provide greater oversight and control over major construction projects. The new Federal Project Director was appropriately certified and assigned Contracting Officer's Representative authority for LANL under the NMSSUP project. In addition, NNSA's APM implemented weekly "Tag Up" meetings to provide greater oversight and established new performance measures for contingency that include the impact of cost overruns and potential liabilities. NNSA also requested and received authority to reprogram \$31 million to fund the remaining project cost overruns; funds that could have been used for other high-priority NNSA mission needs. Finally, NNSA has aligned management responsibilities and authorities throughout the organization and implemented additional project management controls.

Despite these actions, project management concerns remain following the suspension period. A May 2013 peer review and June 2013 EVMS review continued to cite data quality concerns, concluding that project data should not be relied upon to make meaningful management decisions. Both reviews determined that the LANL schedule was unrealistic and/or unexecutable, and that officials continued to forecast optimistic future schedule performance despite repeated and significant delays. In fact, in a September 2013 weekly status report, NNSA forecasted that NMSSUP would not meet the December 2013, Critical Decision-4 completion date and revised completion to February 2014. Therefore, continued, sustained effort is necessary to address the project management weaknesses that exist within NNSA. As such, we made recommendations to further improve project management.

MANAGEMENT REACTION AND AUDITOR COMMENTS

NNSA management concurred with the report's recommendations and acknowledged the problems that previously plagued the project. Management also indicated that, in some cases, it had already taken actions to address specific weaknesses identified in our report. For example, management installed a new Federal Project Director with the appropriate certification and full Contracting Officer's Representative authority. Management disagreed with our description of the evolution of NMSSUP's cost baseline and our conclusion that the project's costs exceeded its approved budget by \$41 million. Specifically, management stated that it would be more appropriate to compare the original baseline total project cost of \$245 million and exclude LANL's payment of \$10 million from the \$254 million currently estimated to be spent. With this exclusion, management concluded that the project's current total project cost of \$244 million was \$1 million below the original baseline plan.

We consider management's comments and planned corrective actions to be fully responsive to our findings and recommendations. While we acknowledge that the current estimated cost to complete the project, less LANL's contribution of \$10 million, is \$1 million less than the original baseline plan, we noted that the current project will deliver only the scope contained in the \$213 million estimate.

Management's comments are included in Appendix 4.

Attachment

cc: Deputy Secretary
Acting Administrator, National Nuclear Security Administration
Chief of Staff

SPECIAL REPORT ON NNSA'S MANAGEMENT OF THE \$245 MILLION NUCLEAR MATERIALS SAFEGUARDS AND SECURITY UPGRADES PROJECT PHASE II AT LOS ALAMOS NATIONAL LABORATORY

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NNSA'S MANAGEMENT OF THE \$245 MILLION NUCLEAR MATERIALS SAFEGUARDS AND SECURITY UPGRADES PROJECT PHASE II AT LOS ALAMOS NATIONAL LABORATORY

Background

Phase II of the Nuclear Materials Safeguards and Security Upgrades Project (NMSSUP) at Los Alamos National Laboratory (LANL) was designed to replace the existing exterior physical security systems at the Laboratory's Technical Area-55. The upgrade was to provide for entry controls as well as infrastructure upgrades. Technical Area-55 houses LANL's high security plutonium assets and operations area. The current phase of the project also includes enhanced systems to support the centralized security control infrastructure. Los Alamos National Security, LLC (LANS) manages and operates the Laboratory for the National Nuclear Security Administration (NNSA).

NMSSUP was initially planned as a project to be completed under one contract awarded to a single contractor. However, because proposals received exceeded Government estimates for total project costs, LANL was directed to divide the project into five separate subcontracts. According to the Los Alamos Field Office, this action was taken after significant analysis and lessons learned from the initial procurement experience on the project when it was bid as a single contract. The subprojects included the West Vehicle Access, Entry Control Facility, South Security Fence, North Security Fence and Utility Building/Utility Trunk.¹ Each subproject had characteristics unique to its purpose or, in the case of the North and South Security Fences, topography differences that required varied solutions. The installation of physical barriers such as fencing, detection equipment and alarms, was common to all subprojects.

Implementation of the revised acquisition strategy resulted in favorable bids, a factor that caused the NNSA to reduce the total project cost from \$245 million to \$213 million. Construction completion was scheduled for September 2012, with systems testing and verification to be completed by January 2013. However, during startup testing of a completed portion of the security alarm system in September 2012, LANL discovered an error in the installation of the duct bank, which housed various cabling needed for alarms and other systems. This error led to the erroneous co-location of security alarm fiber optic cables and a lack of required system redundancy, a problem that impacted all subprojects.

The discovery of the duct bank related problems, along with various quality issues, prompted LANL's suspension of project work and eventual determination that NMSSUP required additional funding and time to complete the project. In January 2013, LANL submitted a revised estimate that increased the total project cost to \$254 million and extended project completion to December 2013. NNSA approved the additional funding needed, less a \$10 million settlement from LANS, and work resumed on the project in January 2013.

Project Management and Reporting

During the course of our review, we identified issues with the construction project management of NMSSUP, including work planning deficiencies, substandard construction work and management systems that failed to provide a clear and consistent view of the project's schedule and cost performance.

¹ North and South Security Fences consist of security fencing with detection sensors, video assessment systems, barriers and a patrol/maintenance road.

Work Planning Deficiencies

NNSA and LANL did not ensure that work scope was fully and accurately planned before entering into construction contracts. Specifically, LANL made scope changes and authorized work with incomplete designs and cost estimates. For example, LANL awarded a contract in 2010 to construct the North Security Fence without ensuring that the design adequately considered up-to-date site conditions. A 2007 site survey determined that there was sufficient supporting soil available to construct the North Security Fence. However, the land eroded due to environmental conditions after the completion of the survey and LANL did not update the contracted design to reflect that there was no longer sufficient support for the North Security Fence. To address this issue, LANL authorized the construction of a retaining wall, again without updating designs or developing a complete cost estimate.

After construction began, project officials discovered that they had failed to identify that the retaining wall foundations were in the path of an existing radioactive liquid waste line. As a result, an additional retaining wall was required. During a project cost review performed in November 2012, NNSA determined the additional, unplanned retaining wall increased project costs by \$11.7 million. An estimated \$8.9 million of the total \$11.7 million retaining wall costs were the result of cost impacts or delays to other subcontracts. For example, cost impacts included \$4.2 million in additional security costs and \$1.7 million to a construction contractor unable to proceed with improvements in the North Security Fence area until the additional retaining wall was complete.

In another case, LANL contracted for construction of the West Vehicle Access without ensuring that the design included all security requirements. For example, enhancements to detection and assessment capabilities necessary to complete the security portion of the West Vehicle Access were not included. Additionally, road modifications necessary to prevent drivers from unsafely crossing outgoing traffic to access the West Vehicle Access facility badge reader had not been addressed in the overall design. The required changes resulted in an increase in project cost of \$2.6 million and contributed to the West Vehicle Access facility not being substantially completed until July 2012, 16 months behind schedule. The scope changes to the North Security Fence and West Vehicle Access added a total of \$14.3 million to NMSSUP project costs.

Design and Construction Quality

Similarly, NNSA and LANL did not ensure that construction contractors performed quality work. For example, a contractor incorrectly installed a duct bank, which led to the co-location of alarm fiber optic cables because design drawings contained conflicting instructions. Security system cabling for the protection of special nuclear materials must be redundant and physically separated to avoid a single-point failure within the system. However, construction contractors co-located cables from different security systems, thereby creating a single-point of failure within the security system. Although LANL identified and had the contractor correct the co-location of fiber optic cables in one section of the project during 2011, LANL did not determine whether an adjoining section had similar errors of co-located fiber optic cables. The extent of this problem affected the entire project and was not identified until mid-September 2012, during startup and testing of the security systems. Furthermore, during our examination of completed work, LANL Security officials pointed out many examples of substandard work performed by the construction subcontractors, including a concrete section that had missing dowels for the connecting concrete pour and several quality problems related to fencing. As to fencing, we observed problems related to post spacing, post plumbness,

post-hole centering, height of concrete crowns, and grading for drainage. Similarly, LANL Security officials showed us pictures of fence posts installed with improper drainage due to pole foundations being installed 6 inches below grade (Picture 1); and the lack of crowning of concrete to facilitate water drainage away from the fence posts (Picture 2). LANL Security officials explained to us that as the organization responsible for operation of NMSSUP following project completion, they were concerned with the quality problems they witnessed during construction, but did not have authority to direct the subcontractors to correct observed quality problems. Instead, security officials reported identified problems to the NMSSUP project team.

Picture 1:
Pole Foundations Installed 6 Inches Below Grade



Picture 2:
Lack of Water Drainage from Fence Posts



In February 2013, we accompanied LANL security officials on a tour of the construction site and found that these issues had not been corrected.

Management Information Systems

LANL and the Los Alamos Field Office did not ensure that management information systems provided complete and accurate information necessary to manage the work of multiple contractors and to apprise senior NNSA management as to the cost and schedule status of the project. In fact, a June 2013 Earned Value Management System (EVMS) review concluded that LANL did not maintain and implement its approved EVMS as required by Department Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*. The review raised serious concerns regarding LANL's implementation of its EVMS and its ability to use this valuable tool to monitor and control project performance. In addition, the reviewers concluded that due to the lack of data quality, LANL's EVMS data should not be relied upon for independent assessment of project performance or to make meaningful management decisions.

Project Schedule Management

LANL did not have an accurate and fully integrated schedule to manage the project. Although LANL officials stated that they had an approved integrated schedule as far back as June 2009, the schedule as executed contained accuracy and integration concerns between the subprojects as identified in several reviews from 2010 to 2013. For example, a January 2011 peer review reported the combined project critical path was not clear because links did not exist to measure the impact of new activities and interface impacts across subprojects. A former Chief of Defense Nuclear Security expressed his concern that LANL was unable to produce an integrated schedule in 2011. In fact, he reported to have felt "blind" to the schedule. In 2012, a follow-up peer review determined that the summary working schedule used to manage the construction activities had not been fully integrated, resulting in a less than adequate schedule for determining the remaining work effort. The review identified hundreds of construction activities that were not logically tied to preceding or succeeding activities or were out of sequence.

Finally, a May 2013 peer review and a June 2013 LANL EVMS review concluded that similar schedule issues remained after the project restarted following the suspension period. The peer review determined that the schedule was incomplete and was missing activities, some of which were near critical path work. For example, the schedule did not include rework of the North Fence and engineering, procurement and installation of the engineered road section over the manholes. The EVMS review issued 52 Corrective Action Requests and determined that LANL's EVMS did not comply with 23 of 32 American National Standards Institute guidelines.

The review also identified critical path issues for each of the four subprojects, and the deficiencies identified made the schedules unreliable for managing the project. According to the NMSSUP Project Execution Plan, the EVMS monitors the project's achievement of, or deviation from, established cost and schedule goals. EVMS cost and schedule metrics rely on the input of accurate and up-to-date schedule data because metric calculations are based on a comparison of schedule and cost performance against actual work accomplished and its associated cost.

Therefore, the reviews concluded that the NMSSUP schedule and EVMS were unrealistic and should not be relied upon to make meaningful management decisions or forecasting performance. NNSA's position as of July 2013, confirmed that LANL did not have an accurate, fully integrated schedule. According to NNSA officials, the schedule was not loaded with the resources needed to perform the work scope and it was not fully integrated between the subcontractors.

Project Activity Reporting

LANL did not accurately report schedule and cost performance, in its EVMS, nor to the Department of Energy's (Department) Project Assessment and Reporting System (PARS II), key systems designed to alert LANL and NNSA senior managers about the status of the project. Several NNSA assessments throughout the project found that schedule data in those systems was inaccurate. As such, the assessors concluded that LANL's EVMS performance measures were unreliable. In April 2012, a Department's PARS II assessment reported that the lack of an accurate integrated, resource-loaded schedule for a period of approximately 10 months resulted in reporting inaccuracies of project performance. The assessment further noted that without an updated schedule, EVMS data was suspect and may not have been a good indicator of project performance.

LANL also inaccurately reported schedule performance, which masked the impact of project delays by assuming unrealistic future performance. LANL uploaded project schedule data into the PARS II. Our review of the data revealed that LANL reported wide fluctuations in schedule delays. As shown in Table 1, in January 2011, the PARS II reported that no activities were 90 days late; however, in the following month, nearly 800 activities were reported as more than 90 days late. In January 2012, no activities were reported as more than 90 days late. In February 2012, the number of activities in excess of 90 days increased to nearly 1,300 activities, similar to the trend reported in December 2011. LANL project management officials were unable to explain the inconsistency in data. In addition, we noticed that PARS II also provides a Duration Index to indicate how quickly the remaining activities must be completed for the contractor to remain on schedule. For example, the 1.47 Duration Index for both December 2011, and February 2012, indicated that LANL planned to perform the remaining scope of work in 47 percent less time than originally scheduled. Given the past negative schedule performance trends, this level of performance appeared to be highly unlikely, should not have been relied on, and in fact, was not sustained.

Table 1:
PARS II Schedule Dashboard

	NMSUPP II End Date Slips (Days)				Duration
	< 30	> 30	> 60	> 90	Index
Aug-10	1,217	80	47	91	1.13
Sep-10	500	155	162	458	1.36
Dec-10	802	246	167	683	1.42
Jan-11	1,943	2			1.00
Feb-11	874	205	155	790	1.45
Dec-11	890	248	171	1,254	1.47
Jan-12	2,712	1			1.00
Feb-12	919	260	169	1,269	1.47
Apr-12	847	288	25	25	1.09
May-12	767	326	59	28	1.2

The May 2013 Peer Review cited similar concerns with the project schedule since the restart of the project. The review stated that the project schedule was theoretically sound and reasonable. However, it also pointed out that due to lack of performance and critical path delays, the schedule was not achievable. Specifically, no activities were completed on schedule after the restart, yet the optimistic bias of project team showed that going forward all activities will not only complete on

time but early. The peer review estimated the project had experienced a schedule delay of at least 6 weeks and determined that it would likely encounter additional schedule delays. As a result, the review concluded that LANL did not have a realistic schedule for project completion.

Project Cost Reporting

LANL's and NNSA's management systems failed to provide a clear and consistent view of the project's cost performance. Specifically, we determined that information provided by the NMSSUP project team was used as a basis to brief the Administrator of the NNSA did not disclose the full impact to contingency of forecasted or potential liabilities and cost overruns. The project liability impacts, however, were disclosed to a former Chief of Defense Nuclear Security in separate briefings. We found that the reported contingency varied by nearly \$30 million between the two briefings. For example, as shown in Table 2 (page 7), September 2011 data in project briefings to the NNSA Administrator reported nearly \$37 million in remaining contingency funds, yet the last monthly report using August 2011 data to the Office of Defense Nuclear Security disclosed that only \$7 million was available due to forecasted liabilities associated with unapproved work. NNSA stated that since early 2012, narrative briefings informed the Administrator that the project was in danger of exhausting the approved funds based on potential liabilities. However, we reviewed the Administrator briefing documents for February through May that showed there was sufficient contingency to address the potential liabilities. For example, the February 2012 briefing document stated total contingency of \$28.9 million and total potential liabilities of \$13 million. Only the May 2012 narrative contained information that the project had exhausted its funding. Specifically, the briefing document indicated a potential funding shortfall of \$4.6 million based on the estimated total project costs of \$217.6 million compared to the approved funding of \$213 million. The disclosure of a potential funding shortfall, however, was inconsistent with other information presented in the briefing that stated total contingency of \$24.7 million was available, which was more than sufficient to cover total potential liabilities of about \$5 million.

In addition to project liabilities, the Los Alamos Field Office did not fully report the amount of contingency funds required to cover cost overruns to NNSA's management. The Chief of Defense Nuclear Security stated that although he was informed of the potential liabilities, he was not informed of the magnitude of the project cost overrun that would require contingency funds. Further, NNSA officials told us they were aware of the inconsistencies in the project performance reports; however, data inaccuracies prevented them knowing the extent of the problems. By the time August/September 2012 contingency data was reported, the NMSSUP team reported \$22.7 million of contingency funds available to the Administrator; however, according to our calculations, unreported liabilities and cost overruns that totaled more than \$44 million resulted in an actual contingency shortfall of \$21.6 million. As shown in Table 2, a smaller contingency shortfall was evident as early as September 2011. According to a Department official who NNSA referred us to as a subject matter expert on contingency, project contingency should have been adjusted to reflect the amount of potential liabilities and cost overruns. Such adjustments to contingency funds ensures that sufficient contingency funds are available to avoid exceeding project funding levels. If this information had been disclosed, NNSA may have been able to take action to avoid the project shutdown a year later.

Table 2:
Effect of Liabilities and Cost Overruns on Contingency Fund Reports

Data Date Presented Month/Year	Reports to NNSA Administrator (PARS II)	Reports to Defense Nuclear Security NA-70 Net of Liabilities	Total Impact of Liabilities & Cost Overruns	Contingency Shortfall Compared to Reports to NNSA Administrator
Sep - 11	\$36,852,000	\$7,356,088	(\$38,129,912)	(\$1,277,912)
Aug/Sep - 12	\$22,661,550	(\$1,452,000)*	(\$44,294,625)	(\$21,633,075)

* The last report to Defense Nuclear Security before the shutdown contained August 2012 data.

Also, had a thorough analysis been completed to determine the extent of the cost, scope and budget variances, NNSA would have been better positioned to improve management of the NMSSUP project at both the Federal and LANL levels. According to NNSA, contingency funds reported to the NNSA Administrator were automatically generated in the PARS II system based on approved baseline changes, which could take several months to be reflected in the reporting system. In addition, LANL stated contingency funds did not reflect cost overruns because baseline changes could not be processed for cost overruns. We believe that reporting contingency funds based only on approved baseline changes is a lagging indicator of available project funding because it lacks two major elements effecting contingency funds – potential liabilities and cost overruns. Finally, our review of PARS II contradicted the automated constraints cited by NNSA and LANL. The Federal Project Director manually enters remaining contingency funds into the system on a monthly basis. Therefore, the Department could broaden the definition to potential liabilities and cost overruns as recommended by the Department's contingency subject matter expert.

NNSA and LANL Management

Project management weaknesses existed or continued to exist despite being identified because: (1) key management officials were not qualified or authorized to take prompt action; (2) the Los Alamos Field Office and LANL did not implement effective corrective actions to address numerous assessments findings; (3) LANL failed to hold its contractors accountable; and (4) NNSA and LANL did not have accurate management reporting systems.

Federal Project Staffing and Authorities

The Los Alamos Field Office did not staff the NMSSUP for successful project execution and did not provide sufficient authority to the Federal Project Director to correct LANL performance concerns. NMSSUP's \$245 million total project cost required the Federal Project Director to have Level-3 certification in project management. However, contrary to Department Order 361.1B, *Acquisition Career Management Program*, the Los Alamos Field Office assigned a Federal Project Director without the necessary certifications to manage a project of NMSSUP's size.

Project reviews identified this as a concern as early as 2008. One review recommended that the Los Alamos Field Office identify an appropriately certified Federal Project Director or authorize the

existing Federal Project Director to obtain Level-3 certification within a year of appointment and monitor his performance regularly. The lack of appropriate certification continued to be a concern and was highlighted in NMSSUP Red/Yellow Reports. In fact, NNSA stated it expected the NMSSUP Federal Project Director to receive appropriate certification by June 2011 in its Fiscal Year 2012 Congressional Budget Request, but that did not occur.

In addition, the Federal Project Director overseeing the NMSSUP was not granted the authority needed to direct the project. Specifically, Department Order 413.3B recommends appointing the Federal Project Director as the Contracting Officer's Representative (COR). The Order does not require COR authority for Federal Project Directors. Further, Los Alamos Field Office officials told us they were following a local practice, which limits the number of Federal employees providing official direction to LANL. Without contractual authority, the Federal Project Director was unable to direct LANL to correct problems, such as those related to quality, without enlisting the help of other NNSA officials. However, he was also held accountable for successful execution of the project. Moreover, several NNSA reviews as early as September 2009, identified the lack of COR authority as adversely impacting the Federal Project Director's ability to acquire information timely or direct LANL in project performance. The reviews recommended that the Los Alamos Field Office authorize the Federal Project Director to complete COR certification requirements and delegate COR authority to him.

Despite project review recommendations, a senior Los Alamos Field Office official was appointed as the COR, but he was not in a position to effectively monitor the project. As the appointed COR, it was the senior level official's responsibility to direct LANL to correct problems, such as those related to quality. Specifically, the NMSSUP COR oversight responsibilities, which cannot be redelegated, included redirecting project effort and work emphasis, providing written technical and performance direction, and providing written notice to the Contracting Officer of significant contractual performance failure and if the project would not be completed according to schedule, and/or estimated cost. However, the senior official provided us with only one written memorandum to LANL that formally communicated performance issues. Although the Federal Project Director identified the majority of these issues in the middle of 2010, formal written communication was not done until April 2011. A March 2012 Peer Review observed that the senior level official did not appear to be actively engaged with the day-to-day activities of the project. The senior official told us he had numerous other responsibilities in addition to NMSSUP COR and was relying on the Federal Project Director to provide with the LANL performance concerns requiring his attention. According to NNSA management, problems with the Federal Project Director's authority and certification continued until a high level organizational realignment reassigned the Federal Project Directors to NNSA's Office of Acquisition and Project Management (APM). Upon enactment of the reorganization, APM immediately appointed a properly certified Federal Project Director with formal COR authority and more direct access to both NNSA management and the NMSSUP Contracting Officer.

Corrective Actions

The lack of proper staffing and clear lines of Federal authorities, in turn, contributed to a lack of effective corrective action on the part Los Alamos Field Office and LANL to address project management issues identified in numerous independent assessments and reiterated in the Office of Defense Nuclear Security's May 2010 memorandum. Specifically, in May 2010, the Chief of Defense Nuclear Security sent a memorandum to the Los Alamos Field Office expressing concern

over issues associated with security interfaces, design insufficiencies and construction scheduling. The memorandum stated that the Federal Project Director had repeatedly brought these and other issues to the attention of the NMSSUP project team; however, effective resolution by LANL had not been achieved. The Office of Defense Nuclear Security stated that it was relying upon the Los Alamos Field Office to support the Federal Project Director and address the aforementioned problems outlined in the memorandum. Despite numerous reports and communications citing LANL project management concerns and the Federal Project Director's certification and authority, the Los Alamos Field Office failed to correct the deficiencies with more active engagement of the senior official.

We noted that LANL developed a corrective action plan to address the concerns expressed by the Office of Defense Nuclear Security. The Los Alamos Field Office followed up on LANL's actions through the oversight activities performed by the Federal Project Director and monthly project review meetings. However, we question the effectiveness of LANL's corrective actions and the Los Alamos Field Office's oversight activities given the overwhelming evidence that the problems outlined in the May 2010 memorandum continued throughout project execution.

For its part, LANL also failed to adequately respond to identified findings and concerns about the project. For example, LANL did not adequately respond to independent review concerns about the lack of an integrated construction schedule necessary to coordinate work between the various design and construction contractors. As early as May 2010, the Office of Defense Nuclear Security expressed concern regarding the lack of proper construction sequence planning that was impacting construction and other activities. Although LANL officials believed that the summary schedule of the contractors' individual schedules achieved the purposes of an integrated schedule, the summary schedule failed to identify the cascading effects of schedule delays of one contractor on another as would have been shown in a fully integrated schedule. As of July 2013, these schedule concerns had not been corrected.

Similarly, LANL did not correct weaknesses identified in its baseline change control process that adversely affected its reporting of project cost and scheduled performance to management. Specifically, in January 2011, a peer review reported that LANL approved some Baseline Change Proposals (BCPs) without a definitive scope, budget and schedule. These BCPs had no supporting documentation, contained a loosely defined scope of work, and were used by the project to expedite the authorization of new work. This is not a proper use of the baseline change process because it allows the use of project funds without a proper definition of the work scope and a valid cost estimate for performing the work. The January 2011 review also noted that these BCPs were not processed in a timely manner and were rarely seen or approved by the Los Alamos Field Office. For example, in July 2010, LANL directed a subcontractor to build a retaining wall under a series of change requests without a completed engineered solution and construction estimate; however, a BCP was not approved until almost a year following the first submission. To address this issue, the peer review recommended that LANL properly process BCPs as quickly as possible.

In response, rather than improving the timeliness of BCPs, LANL implemented an "Express BCP" process, which allowed LANL to authorize critical new work without cost estimates and NNSA approval when stopping work to process a BCP would negatively impact cost and schedule. Express BCPs were required to be followed by an approved BCP within 60 days of signature of the Express BCP. However, during the course of our review, we identified an Express BCP authorized by LANL in March 2012 for payment to a construction contractor to cover the additional cost of work

performed. The follow-on BCP, which should have occurred by May 2012, was never approved. LANL stated that NNSA incorporated approval of this BCP when NNSA approved additional funding in January 2013, 10 months after its submission.

Without timely processing of baseline change documents, the impact of the changes was not visible in the systems used by NNSA to manage the project. Without current schedule and cost data, NNSA's ability to identify and mitigate potential problems was hindered.

Contractor Accountability

Additionally, we found that LANL had not taken appropriate actions to hold subcontractors accountable for substandard work. In particular, although LANL's Subcontractor Technical Representatives, quality assurance personnel and inspectors reported quality problems to management and the contract administrator, we were unable to find any evidence that payment was withheld based upon quality issues. According to a LANL Contract Administrator, LANL did not have a policy or procedure for withholding payment for non-conformance with quality standards beyond the 10 percent retention in the subcontracts.

LANL's Contractor Assurance System Reporting

LANL's Contractor Assurance System (CAS) failed to provide management with an accurate report on the NMSSUP project. Specifically, the CAS consistently reflected satisfactory project performance, contrary to the actual project performance and project assessments by Department personnel (Appendix 1). During our review of the security breach at the Y-12 National Security Complex, *Inquiry into the Security Breach at the National Nuclear Security Administration's Y-12 National Security Complex* (DOE/IG-0868, August 2012), we observed that the Y-12 National Security Complex provided similar positive CAS reports preceding the security incident at that site. For example, we identified that the CAS and local Federal oversight contributed to an atmosphere in which three trespassers gained access to the protected security area directly adjacent to one of the Nation's most critically important and highly secured weapons-related facilities. Specifically, we found that, since 2010, the CAS reports and Federal oversight efforts indicated to senior NNSA officials that the site's physical security systems were functioning as intended. Similarly, LANL's CAS reported the NMSSUP project was proceeding as planned for schedule and cost, even in the months immediately preceding the project shutdown.

Like other NNSA sites, LANL is contractually required to develop a CAS that incorporates the principles of the sites quality assurance program. The purpose of the CAS is to ensure that products or services meet customer expectations, report comprehensive operational and other data, including subcontractor performance, and identify and correct negative performance trends before these trends become significant issues. In our 2013 review of NNSA contractor governance, *Audit Report on the National Nuclear Security Administration Contractor Governance* (DOE/IG-0881, February 2013), we reported weaknesses in NNSA's approach to ensuring that assurance systems were effectively implemented by the contractors. In particular, we found that Federal officials had not provided effective oversight of contractor operations as part of the governance approach. In fact, Federal officials at one NNSA site told us that with the advent of NNSA's CAS they perceived that they were no longer permitted to intervene in addressing identified problems. While LANL developed a CAS process, the target metrics selected for cost, schedule, risk and quality failed to provide proactive indicators of risks in these areas. In fact, an August 2012 Los Alamos Field Office CAS Project

Execution Assessment stated there was not a clear consensus on how the targets for each criterion were developed. The targets for cost, schedule, risk and quality were typically set at the lowest value of the green performance range.

Our review of CAS data revealed that performance metrics were generally reported as green; thereby indicating that project execution was occurring as planned. One of the metrics, CAS Risk, measured the ratio of available contingency funds compared to the current estimated cost to complete the project. For example, the CAS risk score of 4.76 reported in September 2012, (Appendix 1) indicated that the project had more available contingency funds than was needed to complete the project, when in fact, as previously discussed, this was not accurate. Further, LANL's CAS cost and schedule performance indicators showed that NMSSUP's cost and schedule performance was expected to meet its performance baseline as of September 2012 (reported as green). In contrast, NNSA and Departmental officials who provided monthly project status commentary assessed project performance as red, indicating concern that NMSSUP was not being completed as planned. NNSA's concerns were realized when LANL notified the Los Alamos Field Office in an October 2012 memo that NMSSUP would not be completed within the congressional approved funding. In January 2013, LANL revised its CAS reporting data to include the formulas for metric calculation, details of performance ranges and target, and commentary for performance reporting as yellow or red, an indicator that the subject of an assessment is in jeopardy of meeting established goals.

Impact on Security and Project Costs

In addition to contributing to the need to suspend NMSSUP, the project management issues presented herein resulted in increased costs and schedule delays. In particular, in January 2013, LANL extended project completion to December 2013, nearly 1 year beyond the original completion date. The project is also likely to incur an additional \$14.4 million in overhead costs associated with extending the project schedule. LANL estimated \$5 million in additional security costs to ensure adequate protection of the Technical Area-55 facility during the extended construction phase, \$6.8 million in project management oversight costs, and \$2.6 million for suspension costs associated with the extended project duration until project completion. In total, NMSSUP will require an additional \$41 million more than anticipated to complete. To cover the increased costs, NNSA requested authorization from the Department to use \$31 million in funding originally planned to cover potential fee earned by LANL and other contractors for management of Department sites during Fiscal Year 2012.

Although it failed to take effective action to address project management weaknesses in NMSSUP, the Department had implemented detective controls that identified many of the issues in this report and are critical to holding Department contractors accountable for their performance. Specifically, the Department implemented the PARS II, which is the Department's official "System of Record" to track the progress of major construction projects. Because PARS II uses the same data as maintained in our contractors' project management systems, everyone from the Federal Project Director's staff to the Secretary of Energy has access to the same data.

PARS II includes analytical tools such as the schedule dashboard and the duration index, which identified the unrealistic future schedule performance required to meet schedule milestones.

Furthermore, the Department's Office of Acquisition and Project Management, NNSA's APM, and the Los Alamos Field Office performed over 10 project, EVMS and CAS Reviews on NMSSUP since 2008. These reviews along with PARS II assessments identified many of the project management concerns regarding cost, schedule, and EVMS reporting as well as project staffing concerns identified in this report and are key tools for holding Department contractors accountable. NNSA officials acknowledged that, even though they received the output from these systems, adequate action to resolve the issues identified over the project's life cycle were not taken.

NNSA took a number of positive actions to hold LANS accountable for lack of performance. For example from 2010 to 2012, NNSA reduced LANS' at-risk fee by \$22 million. In October 2012, NNSA's APM chartered a cross-functional team that led to a negotiated settlement with LANS of \$10 million toward unallowable project costs. In addition, LANL required changes to improve the construction contractors' quality control programs prior to restarting project work, increased engineering oversight at the design firm and on the project work site, and has begun a process for determining culpability for poor workmanship. Finally, NNSA's APM plans to ensure that corrective actions are taken to address independent assessment findings prior to attaining the next critical decision.

To improve Federal oversight, NNSA has aligned management responsibilities and authorities throughout the organization and implemented additional project management controls. In particular, NNSA's APM has line authority to provide greater control over major projects such as NMSSUP, and has established weekly "Tag Up" meetings as well as monthly and quarterly briefs to include construction work details and performance measures for contingency and management reserve to include potential liabilities and spending variances. Changes were also made to the project team lead Federal Project Director. The new Federal Project Director was appropriately certified and designated as a COR for LANL under the NMSSUP project. Additionally, BCP scope modifications now require approval by both the Program Office and NNSA's APM, the Federal Project Director reports to NNSA's APM, and contingency funds will be managed by the Los Alamos Field Office.

Despite these actions, project management concerns remain following the suspension period. A May 2013 peer review and June 2013 EVMS review continued to cite data quality concerns and that project data should not be relied upon to make meaningful management decisions. The EVMS review reported serious concerns regarding LANL's implementation of its EVMS and its ability to use earned value to manage project performance. Major areas of concern included lack of cost, schedule and scope integration, lack of schedule integrity and inadequate estimate at completion implementation. The project experienced a schedule delay of at least 6 weeks and the May 2013 review concluded that the project was not properly positioned to meet the Critical Decision-4 date, and would likely exceed the \$244.2 million total project costs without senior management focus. In fact, in a September 2013 weekly status report, NNSA forecasted that NMSSUP would not meet the December 2013 Critical Decision-4 completion date and revised the completion date to February 2014. Continued management focus and sustained effort is necessary to address the project management weaknesses that exist within NNSA.

RECOMMENDATIONS

To improve the effectiveness of construction project management, we recommend that the Associate Administrator for Acquisition and Project Management, NNSA ensure that:

-
1. Construction performance measures are consistently reported to all levels of NNSA management;
 2. Reported performance metrics for contingency funds include potential liabilities and spending variances;
 3. Reported performance metrics include the magnitude of cost and schedule variances; and
 4. Effective corrective actions are taken to address independent assessment findings regarding the NMSSUP project.

To promote CAS effectiveness, we recommend that the Acting Manager, Los Alamos Field Office direct LANL to:

5. Ensure that its subcontracts contain adequate clauses and provisions and that these clauses and provisions are enforced to hold subcontractors accountable for substandard work;
6. Establish performance metrics for construction that measure contractor performance and identify and correct negative performance trends before they become significant issues; and
7. Effectively correct EVMS deficiencies.

MANAGEMENT REACTION

NNSA management concurred with the report's findings and recommendations and provided corrective actions that have been taken or are planned to address the issues identified in this report. For example, management provided the new Federal Project Director a new, highly qualified contractor project manager, additional federal and contractor support as well as enlisted the support of the Army Corps of Engineers. Management plans to ensure that LANL fulfills its responsibility to fully assess all construction contractor claims and reject those that are unallowable. Finally, management committed to perform a follow-up EVMS review currently scheduled for the third quarter of FY 2014. Management agreed that additional improvements and continued focus on the remaining challenges is critical to ensure effective correction of the underlying management issues.

Management disagreed with our description of the evolution of NMSSUP's cost baseline and our conclusion that the project exceeded its estimate by \$41 million. NMSSUP's original total project cost baseline was \$245 million. Management stated that in April 2010, the project reduced the estimated cost to \$213 million without a thorough understanding of the risks and based on unreliable EVMS data. LANL proposed increasing the total project cost to \$254 million in January 2013, but management rejected that proposal and reached an agreement wherein the contractor would absorb \$10 million and set the new total project cost at \$244 million. Therefore, management concluded that the current total project cost of \$244 million is \$1 million below the original \$245 million baseline plan.

AUDITOR COMMENTS

We consider management's comments and planned corrective actions to be fully responsive to our findings and recommendations. While we acknowledge that the current estimated cost to complete the project is \$1 million less than the original baseline plan, less LANL's contribution of \$10 million, we noted that the current project will only deliver the scope contained in the \$213 million estimate.

Management's comments are included in Appendix 4.

COMPARISON OF ASSESSMENTS

LANL Assessments				PARS II Assessments		
CAS CPI	CAS SPI	CAS (Risk (Contingency))	LASO FPD	DOE MA- 63	NNSA APM-20, 22	
Sep-11	0.95	0.91	2.37			
Feb-12	0.92	0.89	2.64			
May-12	0.91	0.95	2.91			
Jul-12	0.92	0.95	3.35			
Sep-12	0.91	1.01	4.76			

- CPI – (Cost Performance Indicator) is an index showing the efficiency of the utilization of the resources on the project.
- SPI – (Schedule Performance Indicator) is an index showing the efficiency of the time utilized on the project.

OBJECTIVE, SCOPE AND METHODOLOGY

OBJECTIVE

The objective of this review was to determine the underlying reasons why the Nuclear Materials Safeguards and Security Upgrades Project Phase II (NMSSUP) was not completed within cost and schedule.

SCOPE

We conducted the review from October 2012 to September 2013, at Los Alamos National Laboratory (LANL) in Los Alamos, New Mexico; the National Nuclear Security Administration (NNSA) Albuquerque Complex, in Albuquerque, New Mexico; and NNSA Headquarters in Washington, DC.

METHODOLOGY

To accomplish the objective, we:

- Reviewed earned value and contractor assurance systems and oversight, and guidance and policies and procedures applicable to project management;
- Reviewed NMSSUP peer reviews and quality assessments, as well as Laboratory Contractor Assurance System and Earned Value Management System evaluations from the Department of Energy, NNSA, and the Los Alamos Field Office;
- Interviewed key Federal and contractor personnel associated with the NMSSUP and oversight responsibilities;
- Toured the project site multiple times to include testing a sample of construction activities to observe whether construction quality issues identified in July 2012, had been addressed as of February 2013;
- Reviewed documents related to the project budget, subcontract execution and management, design, construction activities, quality assurance and inspections activities, work stoppage, and project work restart activities; and
- Reviewed various project status reports, including the Project Assessment Reporting System, LANL's Contractor Assurance System and monthly project status reports.

Management waived an exit conference.

RELATED REPORTS

Office of Inspector General Reports

- [*Audit Report on National Nuclear Security Administration Contractor Governance*](#) (DOE/IG-0881, February 2013). The audit was initiated to evaluate the development of contractor assurance systems by the National Nuclear Security Administration (NNSA) and its contractors. The audit identified significant implementation issues that adversely affected NNSA's ability to deploy an effective contractor governance system. The contractor governance system was rendered ineffective by what Federal site-level officials referred to as an "eyes on, hands off" approach to contract management. Most troubling, while Federal employees knew of problems at the contractor level, they perceived that the contractor governance approach prohibited them from intervening in contractor activities. Contractor weaknesses identified at the site level were not effectively communicated to senior management officials.
- [*Special Report on Inquiry into the Security Breach at the National Nuclear Security Administration's Y-12 National Security Complex*](#) (DOE/IG-0868, August 2012). This review was initiated to examine the circumstances surrounding the July 28, 2012, security breach at Y-12 National Security Complex (Y-12). We found that the Y-12 security incident represented multiple systems failures on several levels. For example, we identified troubling displays of ineptitude in responding to alarms, failures to maintain critical security equipment, over reliance on compensatory measures, misunderstanding of security protocols, poor communications, and weaknesses in contract and resource management. In addition, we determined that contractor governance and Federal oversight failed to identify and correct early indicators of these multiple system breakdowns. We made several recommendations to further enhance security at Y-12 and across the complex. In response, management identified corrective actions it had initiated or completed.
- [*Special Report on Management Challenges at the Department of Energy*](#) (DOE/IG-0858, November 2011). This annual report identified eight management challenges and placed four areas on our "watchlist" for Fiscal Year 2012. Specifically, the report identified contract management as a management challenge and safeguards and security as a "watchlist" area that warrants special attention by Department officials. The report also noted as a management initiative that the Department is committed to such actions as realigning roles and responsibilities and improving contract and project management.

Government Accountability Office Reports

- [*National Nuclear Security Administration's Plans for Its Uranium Processing Facility Should Better Reflect Funding Estimates and Technology Readiness*](#) (GAO-11-103, November 2010). The audit was initiated, in part, to assess the NNSA's estimated cost and schedule for constructing the Uranium Processing Facility (UPF) at the Y-12 National Security Complex in Oak Ridge, Tennessee and determine the extent to which the UPF will use new, experimental technologies and any risks to the project's cost and schedule of

replacing the existing, proven technologies. Specifically, the U.S. Government Accountability Office found that UPF project costs more than doubled since NNSA's initial estimates in 2004 and construction may be delayed due to funding shortfalls. As of October 2010, the project's schedule was estimated to be completed as early as 2018, and as late as 2022. However, due to a funding shortfall in Fiscal Year 2011, NNSA officials expected the UPF not to be completed before 2020, which could result in additional costs.

- [*NNSA Needs More Comprehensive Infrastructure and Workforce Data to Improve Enterprise Decision-Making*](#) (GAO-11-188, February 2011). The audit was initiated to assess the extent to which NNSA has the data necessary to make informed, enterprise-wide decisions. Specifically, NNSA identified 15 ongoing capital improvement projects to replace or improve existing infrastructure, however, NNSA does not have key information for a number of these projects, including initial estimates for cost, amount of remaining funding needed to complete the project, or completion dates. Additionally, an NNSA official explained that changes in project scope and unforeseen complications have hindered the agency's ability to estimate costs and completion dates for some projects. It was noted that prior audit work identified persistent problems at NNSA with cost overruns and schedule delays for capital improvement projects.

MANAGEMENT COMMENTS



Department of Energy
National Nuclear Security Administration
Washington, DC 20585
November 27, 2013



MEMORANDUM FOR RICKEY R. HASS

DEPUTY INSPECTOR GENERAL
FOR AUDITS AND INSPECTIONS
OFFICE OF INSPECTOR GENERAL

FROM:

CYNTHIA A. LERSTEN *Cynthia A. Lersten*
ASSOCIATE ADMINISTRATOR
FOR MANAGEMENT AND BUDGET

SUBJECT:

Comments on the Office of Inspector General Draft Report Titled
*“Management of the \$245 Million Nuclear Materials Safeguards and
Security Upgrades Project Phase II at Los Alamos National
Laboratory”* (A13LA002 / 2013-02544)

Thank you for the opportunity to review and comment on the subject draft Inspector General (IG) report. The report highlights a number of the well known core issues which National Nuclear Security Administration (NNSA) previously identified and which led to the projects stop work order in September 2012. NNSA acknowledges the problems which previously plagued the project, and has already taken steps to address the issues and set a more effective path for the successful achievement of Critical Decision 4 (CD-4). Some of the most significant corrective actions taken included:

- Installing a new Federal Project Director (FPD) with Level 3 certification and providing the FPD with full Contracting Officer’s Representative authority
- Providing the FPD with additional federal and contractor support
- Enlisting the support of the Army Corps of Engineers to provide additional expertise in support of the project
- Installing a new, highly qualified contractor project manager
- Instituting weekly reporting by the FPD to the Office of Acquisition and Project Management (APM) to enhance corporate oversight and accountability for project performance
- Ensuring that the Management and Operating (M&O) contractor fulfills its responsibility to fully assess all construction contractor claims and reject those that are unallowable.

We agree that additional improvements and continued focus on the remaining challenges is critical to ensure the effective and sustained correction of the underlying management issues. NNSA is committed, as evidenced in the report, to ensuring all of our projects are effectively managed and to holding project managers and contractor personnel accountable for the performance delivered. In addition, APM is in the process of implementing broader reforms to ensure consistent quality for projects across the NNSA enterprise.



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NNSA would, however, like to clarify the evolution of the cost baseline. As currently stated, the report is inaccurate regarding the project cost growing significantly against the original project plans. The original Total Project Cost (TPC) for NMSSUP was \$245 million. In April 2010, the estimated cost was reduced to \$213 without a thorough understanding of the risks and based on unreliable Earned Value Management System data. While Los Alamos National Laboratory did propose increasing the TPC to \$254 million in January 2013, APM rejected that proposal and instead reached an agreement wherein the contractor would absorb \$10 million and set the new TPC at \$244 million. The current TPC is therefore one million below the original plan.

The report provides seven recommendations for management action to further advance improvement efforts in areas including ensuring effective correction of findings from independent assessments; accurate and complete reporting of performance; and enhanced requirements and accountability for subcontract performance. NNSA concurs with the recommendations, and the attachment to this memorandum provides the specific actions taken and planned to address each, as well as timelines for completion. In addition, we have separately provided technical and general comments to further enhance the factual accuracy and clarity of the report. This includes suggested changes we believe should be made to more clearly differentiate between earlier project issues, actions taken for improvement, and the challenges ahead. We appreciate the IG's consideration of these additional comments as deemed appropriate.

Should you have any questions regarding this response, please contact Dean Childs, Director, Audit Coordination and Internal Affairs, at (301) 903-1341.

Attachment

Response to the Inspector General Draft Inspection Report Titled
“Management of the \$245 Million Nuclear Materials Safeguards and Security Upgrades Project
Phase II at Los Alamos National Laboratory”
(A13LA002 / 2013-02544)

Response to Report Recommendations

The Inspector General (IG) recommended the National Nuclear Security Administration:

Recommendations 1 through 3: 1) Ensure construction performance measures are consistently reported to all NNSA management; 2) Ensure reported performance metrics for contingency funds include potential liabilities and spending variances; and 3) Ensure reported performance metrics include the magnitude of cost and schedule variances.

Management Response: Concur

NNSA has instituted weekly reporting by the Federal Project Director (FPD) to the Office of Acquisition and Project Management (APM) to enhance corporate oversight and accountability for project performance reporting on NMSSUP. This supplemental reporting will be continued until CD-4 to ensure full compliance with the IG’s recommendations.

In view of the broader issues with the Los Alamos National Security, LLC (LANS) Earned Value Management (EVM) system that were revealed by the Review for Cause, we are also requiring a higher level of supplemental reporting on other projects. This higher level reporting will be continued until formal closure of the Review for Cause corrective actions which is expected by September 30, 2014. The IG will be kept informed of the status of both NMSSUP and Review for Cause corrective actions via NNSA’s quarterly DARTS reports.

Recommendation 4: Ensure effective corrective actions are taken to address independent assessment findings regarding the NMSSUP project.

Management Response: Concur

APM has already initiated a number of changes to ensure that independent assessment recommendations are fully understood by the project teams and appropriately implemented in a timely manner. Responsibility for reaching agreement with the reviewers on the specific action to be taken, and the expected closure date, has been transferred to the FPD who will also submit updates on the status of each action in conjunction with project reports. These responsibilities are being codified in APM’s new Functions, Responsibilities, and Authority document together with their accompanying oversight requirements. The initial estimated completion date for completing all corrective actions is September 30, 2014, recognizing that actions critical for ensuring NMSSUP is positioned to effectively meet Critical Decision 4 (CD-4) requirements will be taken prior to project completion.

Recommendation 5: Direct LANL to ensure that its subcontracts contain adequate clauses and provisions, and are enforced to hold subcontractors accountable for substandard work.

Management Response: Concur

To date, Los Alamos National Security LLC (LANS) has updated the subcontract terms in the construction pro forma template to ensure performance to the standards described in the subcontract. Currently, subcontractor enforcement language is contained in the following General Clauses and Special Clauses inserted into each construction subcontract:

- GC-39 WARRANTY, to enforce subcontractor performance to standards or correct deficiencies as required.
- GC-40 BACKCHARGES, to charge subcontractors to pay for corrective actions taken by LANS or other LANS subcontractors.
- SC-16 PERFORMANCE BONDS, to produce sureties of performance.
- SC-106 LIQUIDATED DAMAGES, when used, to enforce adherence to schedule.

LANS has and continues to strengthen the shortcomings associated with Subcontract Administrators and Subcontract Technical Representatives (STRs) knowledge on the use of enforcement terms available in construction subcontracts. In fiscal year (FY) 2014 LANS will:

- Assess the need for additional information and training to subcontract administrators and STRs on the subjects of what tools are available to enforce subcontractor performance and how to use them.
- Evaluate the Acquisition Practice and associated processes which address the graduated approach to corrective actions for poor subcontractor performance. These documents outline the processes and tools administrators can use to correct poor performance, including the use of Letters of Concern, Cure Notices and Terminations.
- Increase knowledge on proper use of back charging, bonds, and damages.

We believe the combination of actions taken and planned for FY 2014 will address this recommendation. The estimated closure date for this action is September 30, 2014.

Recommendation 6: Direct Los Alamos National Laboratory (LANL) to establish performance metrics for construction that measure contractor performance and identify and correct negative performance trends before they become significant issues.

Management Response: Concur

In April 2013, the Department of Energy (DOE), the Earned Value Management System (EVMS) certifying agency, conducted a Review for Cause of the LANS EVMS. During the review, 52 Corrective Action Requests (CARs) and 7 Continuous Improvement Opportunity (CIOs) were found. Of the 52 CARs, several specify deficiencies with accurate performance metrics and timely accounting of negative trends. As such, LANS is in the process of revising their EVMS System Description, instituting new policies and procedures, implementing new project control tools, and training project management and project control staff to address the Review for Cause findings. The Review for Cause process requires that a follow-up review be

Attachment

conducted to ensure CARs can be closed. The follow-up review is presently scheduled to occur in the third quarter of FY 2014, depending on LANS' progress. The evidence of completion for this recommendation will be in the implementation of revised and updated monthly performance reporting. The estimated closure date for this action is September 30, 2014.

Recommendation 7: Direct LANL to effectively correct EVMS deficiencies.

Management Response: Concur

In April 2013 the Department of Energy (DOE), the EVMS certifying agency, conducted a Review for Cause of the LANS EVMS. During the review, 52 Corrective Action Requests (CARs) and 7 Continuous Improvement Opportunity (CIOs) were found. As such, LANS is in the process of revising their EVMS System Description, instituting new policies and procedures, implementing new project controls tools, and training project management and project control staff to address the Review for Cause findings. The Review for Cause process requires that a follow-up review be conducted to ensure CARs can be closed. The follow-up review is presently scheduled to occur in the third quarter of FY 2014 depending on LANS' progress. The results of that review will inform the decision on whether to close this recommendation. The estimated closure date for this action is September 30, 2014.

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