



National Nuclear
Security Administration

FY 2013 Performance
Evaluation Report

FOR

Sandia Corporation

Sandia Field Office
Sandia National Laboratories

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Executive Summary

This Performance Evaluation Report (PER) represents the Department of Energy/National Nuclear Security Administration's (DOE/NNSA) evaluation of Sandia Corporation's (Sandia) performance for fiscal year (FY) 2013, against the FY 2013 Strategic Performance Evaluation Plan (PEP) under Contract Number DE-AC04-94AL85000. The Strategic PEP sets forth the criteria to which Sandia's performance will be evaluated and promotes a strategic Governance and Oversight framework based on results tempered by prudent management of risk, accountability, and renewed trust.

Sandia's performance was assessed against the applicable evaluation criteria using a variety of different approaches including, but not limited to, peer reviews, external reviews, achievement of milestones relevant to targets, customer feedback, program reviews, and consideration of the self-assessment provided by Sandia. Overall Sandia provided a more self-critical and comprehensive self-assessment, compared to past self-assessments. The adjectival ratings set forth and defined in Federal Acquisition Regulation Subpart 16.4, Table 16-1 were utilized for each of the Performance Objectives (POs) based on the performance against Contributing Factors, Site Specific Outcomes, and other criteria as set forth in the Strategic PEP.

Sandia's overall performance in the Mission-related POs is Excellent. Sandia effectively managed Directed Stockpile Work (DSW), Campaigns, and Readiness in Technical Basis and Facilities (RTBF) programs, and executed the Science and Inertial Confinement Fusion Programs, while upgrading key capabilities of Z Machine. Sandia met programmatic outcomes, and was able to successfully execute all programs, exceeding expectations on almost all milestones. Sandia continued to excel in executing their non-nuclear weapons missions, delivering quality research results and technology deployments to DOE/NNSA, other government agencies, and non-federal entities. Sandia's achievements were reached through: active management; developing, monitoring, and executing programs/projects; meeting customer goals and objectives in a timely manner; and continually working to improve its business acumen and relationships with customers. Lastly, Sandia exceeded expectations sustaining and further strengthening the science, technology and engineering base of the laboratory through strategic investments in multidisciplinary research foundations, development of capabilities roadmap, discretionary research and technology development, and effective technology transfer of licensed technologies. This multidisciplinary approach to solving complex scientific and technical problems has built strong technical capabilities and competencies that enable mission success across a broad spectrum of mission areas.

Sandia's overall performance in Operations and Institutional Management is Very Good. Sandia exceeded many of the significant performance expectations, and effectively and efficiently managed operations over the past fiscal year. Sandia demonstrated enterprise-wide leadership and program performance while effectively addressing the continuing resolution, sequestration, and NNSA-directed Defense Programs pass back with minimal mission impact. In addition, Sandia delivered responsive management systems ensuring personnel, facilities, capability, and resources were available to meet the DOE/NNSA mission under those same constraints. Underpinning all operations, Sandia maintained effective safety and security programs and exceeded site specific expectations.

However, while Work Planning and Control (WP&C) continues to mature, safety-related events/indicators continue to be observed in WP&C. These indicators relate to understanding operational limits, prompt notifications, and organizational response to incidents and other than

normal operations. Engineered Safety is also continuing to mature. Sandia devoted management attention and resources toward improving safety culture and trending analysis, which has led to improved efforts to review safety related data and events for learning opportunities. The results of the increased management attention towards improving safety culture was demonstrated at the working level when Sandia self-identified a potentially serious issue where Line-led construction contracts lacked effective flowdown of safety requirements which could enable unauthorized work. Sandia's self-recognition of this issue and the associated corporate corrective actions demonstrate management attention toward improving safety culture. Overall, despite federal budget constraints, uncertainties, and changing customer requirements, Sandia continues to meet and exceed performance, cost, and schedule expectations in all POs.

Performance Objective 1: Nuclear Weapons Mission

Narrative Summary

Sandia successfully managed the Science Campaign, Inertial Confinement Fusion (ICF) Campaign, and other National Security shots on Z Machine in an uncertain, constrained, and fiscally challenging environment. Sandia was able to successfully execute the Science and ICF Programs, while upgrading key capabilities of Z Machine. The pulsed power center at Sandia National Laboratories performed outstanding work supporting material Equation of State (EOS) studies in relevant regimes. In addition, the radiography support has been a key component of the success of Pollux and supports decisions regarding future capability. Sandia provided very good support to the Advanced Simulation and Computing (ASC) Program including standing up and operating special computing resources for the tri-laboratories and other government customers. Their flexibility and responsiveness in pioneering a joint procurement process with the Lawrence Berkley National Laboratory (LBNL), including a joint Lehman review, is noteworthy.

EOY Adjectival

Excellent

Sandia met expectations for the production and shipment of quantities of neutron generators (NG) in the Limited Life Component (LLC) Program Control Document (PCD), except for the W87 Qualification Evaluation (QE) builds. While Sandia produced a War Reserve (WR) W87 NG First Production Unit (FPU) one month earlier than planned and delivered the first shipment of NGs to the Pantex Plant (Pantex) earlier than required, this effort was enabled by a DOE/NNSA driven recovery schedule. In addition, Sandia did not meet the W87 QE build requirements established in the LLC PCD and the new Neutron Generator Integrated Project Plan (NIPP). The acceleration of the W87 schedule was due to Sandia personnel's dedication to problem solving and Small Ferroelectric Neutron Generator (SFENG) production improvements. However, DOE/NNSA drove Sandia to improve the NG program, to finally determine the root cause and produce a recovery plan and the NIPP.

Sandia exceeded expectations on the W76-1 program by delivering three scheduled lots of MC4682 Dual Capacitors above build requirements and ahead of schedule; completing the MC4682A Dual Capacitor Process Prove-In build on time; and passing the MC4682A 'Producibility Review'. Sandia met most Level 2 milestones for the W76-1, W76-0, W78, W87, W88, B61, B83 and W80 stockpile systems and component characterization and component disposition in accordance with directive documents and within site budget allotments.

Sandia met and in some cases exceeded the deliverables for the B61-12 Life Extension Program (LEP), W78/88-1 LEP Study, and the W88 ALT 370 activities, which were within budget profile, scope, and schedule. Sandia performed above expectations in a number of areas, including their work to overcome challenges in the NG production, the successful execution of the radar test drop for the B61-12 allowing the cancellation of follow-on tests, and completion of modal testing for the first B61-12 development test asset (ME1a). Also of note was Sandia's ability to leverage costs between the B61-12 and W88 ALT 370 radar assembly and Electrical Contact Stronglink (ECSL).

Despite significant budget constraints (e.g. sequestration, continuing resolution, pension holdbacks), uncertainties, and changing scope, Sandia met programmatic outcomes and internally resolved multiple funding issues. The Sandia Silicon Fabrication Recapitalization (SSiFR) realized a cost

reduction of \$14.5M (54%) by purchasing a refurbished photolithography system production tool in order to mitigate the highest-risk single point of failure element and keep the project within budget and schedule. Sandia exceeded expectations by characterizing 22,000 parts in the Stockpile Dismantlement Database, 46% above of the original 15,000 parts planned for FY 2013. Sandia achieved SFENG tube yields greater than 70% with a peak of 87%, well above the 40% goal plan. Because of this increase in tube yields, Sandia was able to reduce the number of SFENG tubes being produced from 32 per week to 24 per week resulting in a significant cost savings during the last half of FY 2013. Sandia met expectations by completing all NA-15 Sandia Projects, with the Mechanical and Electronic Fleet Maintenance standing out with the best evaluation rating.

Sandia contributed significantly to increasing the knowledge of the state of the stockpile, resulting in successful execution of the surveillance program in addition to completing all associated milestones within budget and on schedule. This has been demonstrated by the excellent progress Sandia continues to make in conducting Z Machine experiments to support the stockpile, as well as the year's resolution of key long-standing uncertainties about mixture equation of state, accomplishments in measuring high pressure properties of plutonium, and development of a platform for studies of boost physics, which were all noteworthy. The refurbished Cygnus dual axis accelerator produced extremely high-quality radiographs for the Pollux sub-critical experiment at the U1a Facility, exceeding the timing requirement by an order of magnitude, and supporting DOE/NNSA radiographic capability decisions. Sandia developed and applied new x-ray sources for radiation effects testing on Z Machine with record above ground x-ray production, which has helped qualify non-nuclear weapon components for limited lifetime exchange and advanced scientific understanding for the annual stockpile assessment. Sandia also validated a data set characterizing pressurization and breach approaching qualification-level fidelity in support of stockpile assessment activities. Sandia met expectations by completing all the requirements for Cycle 18 of the Annual Assessment process, ensuring the Laboratory Cycle 18 Annual Assessment Reports and Laboratory Director letter were completed and distributed to DOE/NNSA and the Department of Defense (DoD), and by completing all the various activities to support Directed Stockpile Work (DSW) Research and Development, and Engineering programs for the enduring and future LEPs. Lastly, Sandia developed, validated, and deployed improved predictive capabilities to assess performance and lifetime for nuclear and non-nuclear materials as well as met all Level 2 surveillance milestones for the W76-1, W76-0, W78, W87, W88, B61, B83 and W80 stockpile, which led to accomplishing lifetime estimates and assessments for future LEPs.

Sandia met expectations by contributing to the various reporting requirements and numerous data calls throughout the year, including the program and component requirement documents, Selected Acquisition Reports, schedule and risk information for the Integrated Master Schedule, Cost Assessment Program Evaluation (CAPE) reviews, cost and study information associated with the option development and feasibility studies, Quarterly Program Reviews, and monthly reporting, which included Earned Value Management Systems (EVMS) data.

Sandia successfully executed product development and deliveries in the LEPs, Alterations (ALT), and LLC exchanges. Sandia demonstrated great vision in devising solutions to future weapons challenges and validated a data set characterizing pressurization and breach approaching qualification-level fidelity in direct support of the B61-3/4/10, B61-12 LEP, W88-ALT, and W78-1/W88-1 LEP. Sandia completed the planned B61-12 development, characterization, and model validation activities, including developing analysis/test methodology to support B61-12 qualification and assessment activities, producing data sets that validate computer code used in qualification and assessment

activities, and characterization of material response to normal and abnormal environments, that will impact B61-12 design and performance. Sandia also performed upgrades and modifications to the B61/B83 common tester at the Weapons Evaluation Test Laboratory (WETL) and enhanced the development of component material evaluation knowledge and capabilities for selected non-nuclear components. Sandia also developed experimental platforms and capabilities needed to address Radiation Effects Sciences missions.

Sandia sustained and strengthened unique science and engineering capabilities, facilities and essential skills by demonstrating the operation of a linear transformer driver (LTD) cavity using newly developed 5 gigawatt 100 nanosecond LTD bricks, conducting >2000 shots without a pre-fire, and achieving a power density that supports development of a next generation 300-terawatt LTD-powered accelerator. Additionally, radiation test results identified that the new Heterojunction Bipolar Transistor (HBT) design was five times harder to radiation environments than the older design and poses fewer manufacturing issues. Sandia also demonstrated integration of a predictive physics model with thermal battery design activities, reducing the battery development build-test cycle iterations and associated development duration and cost.

Sandia demonstrated the application of new strategies, technologies, and scientific understanding in anticipation of future stockpile needs by commissioning two new significant Z Machine capabilities: (1) the X-ray Thomson Scattering diagnostic that supports high energy density physics experiments, which are critical to the development and validation of advanced models and codes used to characterize weapon component performance by measuring variables in dense plasmas; and, (2) the Photonic Doppler Velocimetry on-axis diagnostic that supports higher pressure experiments supporting stockpile stewardship. In addition, Sandia demonstrated the initial capability for magnetized and pre-heated fusion experiments and commissioned the applied magnetic field capability on Z Machine to enable the Magnetically Applied Pressure Shear strength measurement technique. Challenges in laser pre-heat system accuracy are being addressed through a Final Optics Assembly redesign. Sandia also provided engineering and physics-based lifetime estimates and aging assessments on nuclear explosive package components and materials for weapon refurbishment/replacement.

Sandia conducted 138 impactful shots on the Z Machine, including three plutonium experiments, despite austere funding. Sandia has been operating under Direct Release for the Missile Defense Agency (MDA) with no transmissibility issues. Sandia exceeded expectations within the Kansas City Responsive Infrastructure, Manufacturing and Sourcing (KCRIMS) Weapons Quality Assurance (WQA) requalification program with all requalification activities on schedule and \$2.4M under the FY 2013 estimated budget. Sandia demonstrated the capability to handle more than two Nuclear Explosive Studies (NES) evaluations concurrently; ensured effective contractor-related investigations, material analyses, and management of product-related documentation updates; and provided value added group facilitation during WQA workshop. However, Sandia did not meet quality assurance expectations, based on the inadequate analysis to identify and address systemic WQA issues, resulting in repeat non-conformances and re-work. Sandia completed all of the milestones in the FY 2013 Nuclear Weapon Quality Improvement Plan, which is the first time Sandia has achieved all milestones in this area within a single year. Sandia provided noteworthy assistance to the DOE/NNSA Federal Program Manager by providing technical subject matter experts (SMEs) and content writers, posting content to shared space for team use, processing the gate and site impact analysis packages, ensuring all finally released content was mapped to parent and associated content, and

providing additional logistics. As a result, Sandia helped drive completion of DOE/NNSA gated process requirements in support of LEPs.

Sandia executed key experiments at Z Machine, met all associated milestones, and developed and employed predictive simulations in support of Stockpile Stewardship. Additionally, Sandia contributed significantly to advancing surety technologies using Z Machine. Sandia met expectations with regard to the FY 2013 ASC Level 2 milestones, as all milestones have been completed (all subprograms) with one milestone re-baselined to FY 2014. Sandia expanded the frequency analysis capability for electromagnetic response coupling in support of stockpile needs and significantly improved the analytical capability for aerodynamics. The improved analytical capability has been used to run unprecedented scale problems up to 9 billion elements on Cielo, the scalability has been improved dramatically, and performance on large scale production test cases of 140 million elements has been improved by 30%. These calculations are allowing improved validation of abnormal thermal capability for stockpile analysis. Additionally, simulations of a supersonic over-expanded jet issuing into a transonic crossflow have been carried out using the SIERRA/GasDyn (Conchas) code and an unsteady turbulence model. This represents a sub-system level validation problem for the prediction of spin-to-arm performance for stockpile gravity bombs. However, issues with the current model have been identified and are being resolved.

Sandia successfully used the Predictive Capability Measurement Model (PCMM) to assess four ASC Verification and Validation Focus Area projects. As a stretch goal, in addition to the milestone requirements, Sandia updated the current PCMM table to a fourth generation to address gaps. Sandia exceeded expectations in supporting the Trinity procurement for the computing side of ASC, particularly in their leadership (along with LANL) in this joint procurement with the DOE Office of Science. Sandia's contributions led to a successful evaluation of the Trinity/NERSC-8 proposals in September 2013. Work performed through completion of the Tri-Lab L2 Milestone "Tri-Lab Data Backup and Recovery" milestone 4698 is significant for the ASC Program as it has strengthened capabilities for facilities to support both recovery of applications and relocation of operations in the event of a disaster. For the first time, LANL, LLNL and Sandia have developed and exercised their Tri-Lab Disaster Recovery plans, verifying the ability of each laboratory to backup/recover a weapons code application at a remote site and demonstrating professionalism of the laboratory in an era of increased risks to DOE/NNSA operations. Sandia provided exceptional support in collaborations between DOE/NNSA/ASC and DOE Office of Science/Advanced Scientific Computing Research (ASCR) in computing research, which was demonstrated by Sandia's excellent preparations for meetings and their helpful dialogues within ASC/ASCR in the areas of co-design and software environment research. In these areas, Sandia should also be commended for winning the 2013 R&D 100 Award for the Mantevo project.

Sandia completed noteworthy achievements in maturing the component technologies for the B61-12 LEP. This was demonstrated by implementing a new P6 site schedule and a Hardware Needs Matrix to enhance provisioning, as well as keeping the Federal Program Manager informed of technical basis, test and qualification activities. Additionally, the large amount of successful component level testing conducted by Sandia facilitates the success of the B61-12 development schedule. Lastly, Sandia was successful in creation of an Integrated Master Schedule (IMS) summary tool for an application of new risk management software to assess uncertainty associated with the FY 2019 FPU.

Sandia exceeded expectations in developing enhanced surety technologies to support future LEP initiatives. This was demonstrated by completing the high priority component device development and

Integrated Surety Solution (ISS) implementation for Reentry Vehicle/Reentry Body (RV/RB) ahead of schedule, and in collaborating with the Kansas City Plant to standardize the development of the hardware in support of future LEP initiatives. Lastly, Sandia exceeded expectations by completing the high priority Joint Integrated Lifecycle Surety (JILS) Phase 1 requirements that have informed and directed national surety decisions through unprecedented multi-agency teamwork.

Performance Objective 2: Broader National Security Mission

Narrative Summary

Sandia continues to excel in executing their non-nuclear weapons missions by delivering technology options to a broad range of customers. Sandia's achievements were reached through: active management; developing, monitoring, and executing programs/projects; meeting customer goals and objectives in a timely manner; ensuring appropriate resources are available; ensuring policies and procedures are followed; and continually working to improve its business acumen and relationships with customers. Sandia continually exceeds customer expectations by providing unique, superior solutions to current and anticipated national security threats. Sandia was able to maintain their funding levels for all customers despite federal budget uncertainties. Sponsors time and again concluded that the unique capabilities, resources, and ingenuity available at Sandia are critical to the success of their programs and mission.

EOY Adjectival

Excellent

Sandia accomplished the work under this Performance Objective within budget, scope, schedule, and negotiated risks, exceeding the expected level of quality. Sandia continued to meet or exceed customer requirements despite significant federal budget constraints, achieved cost savings, and met stretch goals on many projects, delivering critical technology to support the national security mission. Sandia continued to improve their customer satisfaction as evidenced by high marks (4.75 out of 5) from their Customer SATisfaction (CSAT) surveys and in maintaining \$896M in interagency work revenue during a difficult budgetary fiscal year. Sandia also continued to improve their management review process providing transparency into the operations and management of programs to the DOE/NNSA.

Sandia exceeded expectations for the Global Threat Reduction Initiative (GTRI) by improving their contracting schedule performance for the Domestic Material Protection Program and, domestic physical security upgrades and sustainment efforts, allowing them to surpass established metrics. Sandia improved their project controls for the GTRI International Program, thereby minimizing carryover for the program while exceeding established metrics. Additionally, Sandia's management of the In-Device Delay (IDD) Program, for the GTRI Protect Integration function, allowed consistent and superior technical performance reducing the risk that radiological sources could be used in a Radiological Dispersal Devices (RDD). However, while Sandia exceeded many budget, scope, and schedule goals, improvement could be shown in their programmatic support and timeliness on international procurements.

Sandia exceeded almost all of the requirements for the Office of Nuclear Safeguards and Security, and in the satellite-based and ground-based nuclear detonation detection arenas. They also provided exceptional project oversight for Office of Nuclear Warhead Protection (ONWP) through effective communications with Russian prime contractors. Ensuring a positive dialog between DOE/NNSA and Russian counterparts has been key to the program's continued success. Additionally, the Second Line of Defense Program continued working within budget, scope, cost, and schedule.

Sandia provided very good to excellent support for several programs in the Office of Nuclear Verification. Sandia's extensive experience and expertise in the contracting and management of the

removal of radiological sources and their technical management of the program tamper indicating devices (seals) for the Highly Enriched Uranium (HEU) Transparency Program were critical to the successful conduct of special monitoring visits to Russian nuclear facilities and equipment decommissioning. Sandia also performed excellent work for the Warhead and Fissile Material Transparency Program (WFMT), which was demonstrated by Sandia's New START implementation, both in Washington, D.C. and in Geneva, Switzerland. However, while Sandia generally had good results from the Nuclear Testing Limitations work, there is a perceived lack of follow-through when tracking/following activities through the approval process.

Sandia pursued and performed high impact work that leveraged, sustained and strengthened the unique science and engineering capabilities, facilities and essential skills to ensure the ability to meet current and future national security mission requirements. This was demonstrated by providing key services, unique technology, and science, technology and engineering development for projects such as: Nuclear Nonproliferation; Cyber Flag; Emergency Responder Training; Space Mission Support; Cyber Countermeasures; and Hurricane Sandy.

Sandia demonstrated quality in its support of nonproliferation and treaty verification work at the National Center for Nuclear Security, especially in Chain-of-Custody, Source Physics Experiments, and forensics. Sandia served as the lead laboratory for engagement in South Asia and select countries in the Middle East, leading the Weapons of Mass Destruction (WMD) Commodity Identification Training (CIT) workshop and assisted in the Malaysian pilot CIT for International Nonproliferation Export Control Program (INECP). Additionally, Sandia led a joint DOE/NNSA, United Nations Office of Drugs and Crime, and World Customs Organization WMD Advanced Interdiction Training and also conducted export control technical review and sister courses with the Kansas City Plant on missile technology export controls and proliferation.

Sandia provided new technology to support space missions that harness state-of-the-art remote sensing capabilities, exceeding customer expectations. Sandia also deployed a defensive cyber operations team and developed tools to support force-on-force exercises demonstrating the ability to prevent and remediate offensive activity.

Sandia transitioned the Standard Unified Modeling Mapping and Integration Toolkit to the Federal Emergency Management Agency (FEMA) which was then used in the FEMA's multi-billion dollar grants process for preparedness funding. Sandia also designed, implemented, and tested cyber countermeasures against sophisticated threats for a commercial security service provider, and conducted vulnerability assessments of sites and systems that store and process sensitive government information, thereby enhancing Sandia's capabilities across the Nuclear Security Enterprise. Sandia provided real-time analytical support in partnership with Los Alamos National Laboratories, to recovery efforts in the wake of Hurricane Sandy by assessing petroleum supplies, prioritizing restoration of electrical and communication facilities, and general recovery effort planning that positively impacted the recovery effort.

Sandia continues to meet customer needs in advancing technologies, countering WMD, and providing technology to warfighters to advance key national security goals, while enhancing capabilities that support the core mission of the laboratory. For example, Sandia expanded their improvised explosive device (IED) defeat technology, thereby protecting the warfighter and further enhancing capabilities to support a complex radar system for nuclear weapons. Additionally, in partnership with the Air Force Research Laboratory and industry, Sandia demonstrated a first of its kind directed energy capability that advances technology bases in radiation effects, to support nuclear

weapons development. Sandia also conducted an Aegis Flight Test demonstrating the ability of space-based assets to provide mid-course fire control quality data and helped maintain capabilities in hypersonic modeling that support nuclear weapons development. Lastly, Sandia achieved breakthrough improvement to an advanced shock physics code (ALEGRA) to design Army armor protective systems.

Sandia's non-nuclear weapons organizations established a long term vision of needed capabilities to enhance national security. These organizations are actively pursuing this vision through partnerships with other federal agencies and industry, the Laboratory Directed Research and Development program, and internal program direction funds to further the laboratories capabilities to prepare the laboratory for the future.

Sandia is improving their effective operations and implementation of policy for mission success; however, safety-related events/indicators continue to be observed. DOE/NNSA shares Sandia's determination to improve Work Planning and Control (WP&C), understand operational limits with respect to Homemade Explosives, reduce time intervals to conduct/complete event reviews and return assets to operational status, and quickly respond to incidents. Continued attention to this area is needed to realize improvement. Additionally, Sandia's management assurance system for Division 5000 is not designed to clearly articulate or provide the necessary transparency for DOE/NNSA to evaluate programs and how they enhance the DOE/NNSA capabilities to address national security challenges. Continued attention to transparency is needed to enhance communication between Sandia and DOE/NNSA.

Sandia contributed to the tri-Lab Nuclear Counterterrorism (NCT) High Explosive (HE) roadmap to guide a cohesive national program and demonstrated outstanding performance in executing the International Radiological Assistance Program Training for Emergency Response (IRAPTER) program. Sandia also developed a modular, multi-purpose, energetic tool that significantly extends the National Mission Force (NMF) operations envelope and transitioned a portable ion mass spectrometer for explosives identification and characterization to customer use. Sandia also demonstrated outstanding performance in executing emergency response operations and missions, supporting exercises and completing deliveries for Render Safe research and development (R&D) products. Additionally, Sandia maintained operational readiness in support of the DOE/NNSA Radiological Assistance Program, Consequence Management Response Team (CMRT) program, and the Pre-Detonation program.

Sandia performed significant and impactful applied energy technology deployments in support of the DOE's sponsored energy and science programs providing credible and transformative energy, climate, and infrastructure solutions for various energy security challenges. Sandia achieved significant scientific breakthroughs based on Predictive Simulation for Internal Combustion Engines that is providing the basis for advancing the next generation of vehicle technologies and combustion engines, promoting global environmental security, and directly supporting the U.S. energy security goals. Sandia installed a third DOE Office of Science sponsored Atmospheric Radiation Measurement (ARM) mobile facility in Oliktok Point, AK, equipped with climate predictive capabilities and integrated measurement technologies for Arctic atmospheric measurements and model development research. Sandia was designated by DOE as the lead laboratory to apply energy infrastructure and resiliency expertise for Smart Power Infrastructure Demonstration addressing energy security at three military installations.

Sandia developed a cheaper, more efficient, and accurate method for measuring irradiance from photovoltaic solar panel reflections for solar power installations and completed the DOE-sponsored Scaled Wind Farm Technology (SWiFT) facility, providing the first-of-kind ability to analyze complex wind flows and turbine to turbine interactions to better optimize power generation at large scale wind plants. Sandia also advanced nuclear energy production technologies by building the largest proof-of-principle recompression closed Brayton cycle test loop using supercritical CO₂ (s-CO₂), a concept that holds promise to improve energy conversion efficiency with less capital cost. Sandia discovered a highly efficient process for ionic liquid pretreatment and saccharification of switchgrass that significantly drives down biofuel production costs. Lastly, Sandia responded to national emergencies and high consequence incidents, such as unique geoscience characterization modeling and expertise in salt domes following sink holes in Louisiana and providing analytical support to Hurricane Sandy recovery efforts for critical infrastructures.

Sandia exceeded most cost, schedule, and technical requirements in meeting its space-based nuclear detonation detection targets, delivering a Global Burst Detector Payload per the Air Force schedule under significant funding constraints, and effectively reducing the size of the program. Additionally, Sandia achieved AS9100C certification from the National Quality Association for the Space Nuclear Detonation Detection (SNDD) program, with mostly internal funds, which helped enable the downsizing of the SNDD program with better documentation and improved quality control yet maintaining the capabilities and expertise to complete the mission in the out years. Lastly, Sandia developed and executed a Foreign Nuclear Weapons Assessment/Capabilities for the Nuclear Intelligence Program Plan within budget and either on-time or ahead of schedule, established an effective governance for the Dark Bridge Sensitive Compartmented Information (SCI) computing platform, and has supported DOE/NNSA in recent interactions with the JASON group.

Performance Objective 3: Science, Technology & Engineering (ST&E) Mission

Narrative Summary

Sandia exceeded expectations in this performance objective as research investments to sustain a strong science, technology and engineering base for science-based nuclear stockpile stewardship are providing the technical basis for annual stockpile assessment and enable mission success. Moreover, these strategic research investments are being leveraged to develop additional capabilities and competencies that enable science and engineering solutions for DOE/NNSA missions, other federal agencies, and industrial partners.

EOY Adjectival

Excellent

Sandia continues to strategically reinvest its discretionary resources in science-based research foundations to further strengthen its science, engineering and technology base to enable mission success for stockpile modernization and across a broad spectrum of other mission areas. A new and comprehensive portfolio of established capabilities has been defined to address multidisciplinary research challenges that directly support science-based nuclear stockpile stewardship and broader national security missions. Additionally, Sandia's success in numerous science and engineering breakthroughs helps to attract and retain a skilled workforce and continues to be recognized through numerous commendations and awards.

Sandia implemented a laboratory-wide research strategy that is directly aligned with discretionary investments and research foundation strategies that support DOE/NNSA priorities. Sandia demonstrated this by promoting mission integration, hosting a series of sessions to inform Sandia researchers of the strategy and challenges to more clearly define/guide research priorities, and also by providing the basis for scientists and engineers to work collaboratively on research challenges that enable DOE/NNSA mission success. The implementation of the multidisciplinary research strategies also provided the basis for the annual stockpile assessment, the confidence for future stockpile stewardship, and the delivery of other national security technical products and solutions. Additionally, Sandia managed a diverse portfolio of over 400 Laboratory Directed Research and Development (LDRD) projects, all of which aligned with DOE/NNSA strategic objectives, and achieved groundbreaking interdisciplinary technical solutions that are transformational, differentiating, and impactful to national security.

Sandia managed research priorities and strategic directions during federal budget uncertainties, diminishing research funding, and changing customer requirements. As a result of Sandia's successful research strategy implementation, Sandia enabled the capability for computational materials synthesis and processing and high-impact codes for parallel computing to enable predictive simulation of physical systems through the Computational and Informational Science Research Strategy. Sandia also enabled unique capabilities to advance the designs of molecular-capture cages for nonproliferation and ultraportable multi-function sensor systems to enable radioactive material detection through the Integrated Nanodevices and Microsystems and Microelectronics Research Strategy. In the areas of Advanced Materials Sciences and Sciences and Nanodevices and Microsystems Research Strategy, Sandia enabled the development of devices and tools advancing the understanding, creation, and application of fielded radiation hardened microelectronics that are impervious to subversion. Lastly, for the High Energy Density Sciences (HEDS) Research Strategy,

Sandia enabled the understanding of special nuclear materials and dynamic material properties and provided unprecedented physical simulation capabilities to assure non-nuclear components for nuclear weapons perform reliably in hostile environments through integrated radiation effects.

The strategic investments Sandia made in science and engineering are relevant to the mission, provide the basis for technology development across broader national security areas, and benefit the DOE/NNSA and the nation. This was demonstrated by integrating nanodevices and microsystems capabilities, providing impactful technical solutions for various national security applications as well as integrated radiation effects science (RES) and HEDS capabilities that strengthen the competencies needed to validate the physical models used to certify the stockpile. Sandia also integrated theory, computational simulation, and experimental discovery and validation to understand and predict the behavior of complex physical phenomena and systems. Lastly, Sandia developed the shock multi-physics code ALEGRA-MHD (magnetohydrodynamic) that allows for greater confidence in design margin and reduction in uncertainty and also developed a new source inversion capability for fully coupled structural acoustic interactions that is designed to reduce the number of flight tests and costs for nuclear weapon systems validation.

Sandia sponsored research continues to be transformative, innovative, leading-edge, high quality and advances the frontiers of science and engineering. This was demonstrated by the numerous commendations and awards across all mission elements and confirmed by results of external peer reviews across all research foundations. For example, Sandia was awarded four "R&D 100" awards (Membrane Projection Lithography, Mantevo Suite 1.0, Solar Glare Hazard Analysis Tool, and ADIOS software) and also earned five regional awards from the Federal Laboratory Consortium (FLC) for work to develop and commercialize innovative technologies. Sandia also regularly communicates their research results with the scientific community through highly cited peer-reviewed research publications, which continues to enhance their credibility.

Sandia continues to foster and maintain a healthy a vibrant research environment that enhances technical workforce competencies and research capabilities. This has been demonstrated by the critical-skills attracted through University Partnerships and collaborative research in academia, the engagement with scientific and engineering communities, and the access provided to state-of-the-art facilities and equipment, all which has helped to strengthen capabilities and core competencies to assure strong workforce management. Sandia has also encouraged and supported national and global engagement with scientific and engineering communities, providing numerous science forums and symposia.

Sandia continues to perform research to accomplish the high priority, multi-year research objectives, advance ST&E and develop technologies for the public good through technology transfer. Sandia provided innovative results through the deployment of technologies that directly enable scientific discovery, economic competitiveness, and promoted innovations in science and engineering. This was demonstrated by the deployment of the Solar Glare Hazard Analysis Tool to assist the Federal Aviation Administration (FAA) Civil Aerospace Medical Institute to minimize solar glare hazards for national air transportation safety and in the development of specialized radar systems in collaboration with General Atomics Aeronautical Systems that enables air surveillance using an operational fleet of over 200 radar systems. Sandia also commercialized coated thermal battery technology with Advanced Thermal Battery, Inc. that allows coating of active battery materials to enable a thermal battery to be shaped to nearly any geometry. Sandia provided advanced product engineering to assist Caterpillar, Inc. with the development of predictive modeling and simulation systems. Additionally, in collaboration with Hewlett-Packard Laboratories, Sandia developed the first memristor

test chip wafers fabricated using the CMOS compatible memristor process. Lastly, the Sandia Science and Technology Park continues to serve as gateway to industrial partnerships that enable technology transfer and local economic development.

Sandia developed a Future Capabilities roadmap that enables Stockpile Stewardship and Modernization and other National Security Objectives. The Sandia National Laboratories Director and Leadership Team championed this effort to identify and define nine critical capabilities (high-reliability engineering; sensors and sensing systems; cyber technologies; reverse engineering; micro- and nano-electronics and systems; modeling and simulation and experiment; natural and engineered materials; pathfinders; and safety, risk, and vulnerability analysis). These new capabilities are being used to define new research investments to meet future DOE/NNSA nuclear security mission needs, and the broader mission needs of DOE/NNSA and other federal agencies, such as cyber security technologies. Sandia also coupled this new framework to a new portfolio of interdisciplinary capabilities, aligned to each laboratory mission area, while also developing multidisciplinary research challenges that provide additional framework for addressing future mission challenges.

Performance Objective 4: Security, Infrastructure, Environmental Stewardship & Institutional Management

Narrative Summary

Sandia exceeded many of the significant performance expectations, and effectively and efficiently managed operations over the past fiscal year. Sandia demonstrated enterprise-wide leadership and program performance while effectively addressing the continuing resolution, sequestration, and NNSA-directed Defense Programs pass back with minimal mission impact. In addition, Sandia delivered responsive management systems ensuring personnel, facilities, capability, and resources were available to meet the DOE/NNSA mission under those same constraints. Underpinning all operations, Sandia maintained effective safety and security programs and exceeded site specific expectations.

EOY Adjectival

Very Good

Sandia accomplished the safeguards and security (S&S) and emergency management mission and successfully managed the impacts of sequestration, while continuing to achieve reductions in the security footprint, improve system performance and also realize operational and process efficiencies through innovative efforts. Although there are some opportunities for improvement, overall these improvement opportunities are not detrimental to the overall effectiveness of the security program. Sandia met expectations in managing the Emergency Management program by performing and evaluating the response capabilities through successful performance of the annual exercise, and by maintaining capability through the drill and training programs. Sandia exceeded expectations in the Emergency Management program by implementing the 4DX process.

Sandia exceeded expectations for managing and sustaining an effective and efficient S&S program. This was demonstrated by resolving physical security-related issues, deploying security system enhancements that increased in the overall reliability of the Diamond II security system and implementing an innovative risk-based Technical Surveillance Countermeasure program. Sandia also implemented a safe, effective, comprehensive and integrated “no notice testing” program for the evaluation of alarm system performance and protective force assessment and response; established processes and procedures to restore classified destruction capability; and mapped and scanned approximately 70 years’ worth of paper-based documentation resulting in a notable security footprint reduction. Sandia was recognized and awarded for their outstanding management of various S&S programs including Materials Control & Accountability Inventory and Reconciliation, Classification and Security Awareness, and Sandia’s formality of operations during shift muster and weapons handling activities was recognized by DOE/NNSA as a National Security Enterprise best practice.

In response to a self-identified issue, Sandia developed a model program to ensure security oversight is provided to tiered subcontractors and that security requirements are flowed down to applicable contracts through a formalized Security Requirements Plan. Sandia created efficiencies that enabled the security program to address new requirements and \$2.7M of unplanned impacts due to sequestration and reprogramming with no adverse impacts to the security program. However, a system of controls and procedures has not been implemented, enforced, and maintained to ensure the timely closure of incidents of security concern. Additionally, the security performance level across the laboratory remains an area of concern based upon reportable security incidents and increases in

the level of severity (i.e., two IMI-1 and five IMI-2 type incidents). Specifically, "Classification Guidance" warrants management attention because three of the five IMI-2 incidents involved classification issues.

Sandia accomplished line item construction projects in accordance with the negotiated budget profile, scope, cost, schedule, and risk. This was demonstrated by Sandia's noteworthy management of the TCR II project, which resulted in the project being on-schedule; the ability to add \$4M in scope that was removed in previous years thereby further enabling the mission; and utilizing \$2.5M of capital line item funds for other means within DOE/NNSA.

Sandia delivered efficient, effective and responsive business operations and systems. This was demonstrated by the Sandia business team, including human resources, finance, and supply chain management, effectively managing through the continuing resolution, sequestration, and DOE/NNSA directed Defense Programs pass back while minimizing and mitigating impacts to personnel and critical programs. In human resources, Sandia implemented multiple workforce strategies to attract and retain talent to maintain future capability, resulting in nine benchmark metrics rating as excellent including two above the national averages by approximately 10% and 14%. Financially, Sandia achieved costs savings and avoidances during this fiscally challenging year through healthcare cost savings, educating the workforce on becoming better healthcare consumers, implementing a cost savings tool achieving \$13.6M in federally validated process savings to invest in future mission capability, and passed back \$27.5M in indirect and programmatic funding to support DOE's environmental management program. However, further reduction in total indirect costs and rates would create more available funds to meet mission objectives. Additionally, Sandia earned DOE/NNSA's highest quarterly ratings for accounting and finance areas, successfully completed the DOE/NNSA directed recast with limited resources, and implemented additional internal controls ensuring integrity in cost transfer data.

Sandia exceeded their Supply Chain Management Center eSourcing Activities goal, with their contribution representing 49% of the entire DOE/NNSA recorded actuals. Although Sandia also exceeded its overall small business subcontracting goal, Sandia did not meet three of its socioeconomic goals: Woman-Owned Small Business, HUBZone, and Service Disabled Veteran-Owned Business. Sandia's subcontract management weaknesses were evident in the areas of consultant agreements (questionable costs and services), Electronic Subcontracting Reporting System administration and reporting, outdated policies and procedures, and have yet to provide transparency into how all contractual requirements are being met. Additionally, DOE/NNSA performed a review of Sandia's characterization of projects greater than \$500k and identified inconsistencies and mischaracterizations issues. Many of the subcontracts that require DOE/NNSA Head of Contracting approval are being submitted with an "urgent" request which negatively impacts the ability for a thoughtful review. However, DOE/NNSA recognized Sandia as having an excellent subcontract audit practice, which has been shared with other DOE/NNSA sites, is continuing to improve purchase card reviews and reporting ensuring accountability in this high visibility program, and was recognized once again by Government Fleet Magazine as a "Top 100 Fleet".

Lastly, Sandia's Freedom of Information Act submissions continue to fall short of required quality, specifically noted was the lack of documentation for Sandia analysis of exemptions, leading to unacceptable delays in responses. Additionally, Sandia's Organizational Conflict of Interest (OCI) Management Plan needs substantial improvement to assure that all types of OCI are addressed for each of Sandia's areas of potential risk, and responsive and effective strategies and processes are developed and implemented.

Sandia delivered efficient, effective, and secure networks and information systems. Effectiveness was demonstrated through the high marks earned on DOE/NNSA inspections and through the award of nine Excellent ratings and one Very Good rating on the 10 Communications Security program accounts inspected by DOE Office of Health, Safety and Security. Efficiencies were demonstrated through a data center consolidation strategy that avoided \$1.1M in unnecessary costs and implementation of standardized earned value and project management tools to better integrate earned value management, and corporate financial and human resource systems information into all levels of project management.

Sandia actively led and supported DOE/NNSA “cloud-based” network initiatives and continues to be a national leader in cyber security forensics, analysis, incident remediation and response, providing invaluable information and direct assistance to numerous federal agencies in the form of indicators of compromise and attack methodologies related to a sophisticated attack on two of their external servers. Sandia proactively shared information about upgraded incident response tools and capabilities with cyber security personnel from other DOE/NNSA sites and DOE/NNSA. Finally, they significantly enhanced the portability and effectiveness of information system security plans by migrating all classified and unclassified security plans and control libraries to federal standards and further integrating risk analysis into the security control selection process.

As a result of a sequestration budget cut, Sandia made minimal progress this year on implementing continuous monitoring, a key risk-based capability. Additionally, the National Archives and Records Administration identified numerous deficiencies with Sandia’s Record Management Program that warrants increased focus in 2014. Lastly, Sandia needs to achieve in the coming year the same level of assurance for the Field Intelligence Element Telecommunications Security Program as is currently provided for collateral facilities.

Sandia delivered efficient and effective facility and infrastructure portfolio management. Sandia's performance has provided positive contributions to complex wide initiatives, improved site Facility Information Management System (FIMS) performance metrics, and exceeded targets for fleet fuel, energy, and water intensity reduction. Sandia also made significant improvement with facility inspections going from red to green in one year on the FIMS validation, conducted community outreach activities, develop a benchmarking tool to be used by the government and private industry to compare key energy performance measures with the Association of Energy Engineers, and created an Institutional Transformation project that will inform funding decisions (to reduce energy) across sites, building types and time.

Sandia continues to make improvements in delivering efficient, effective, and responsive environment, safety and health management and processes. While Work Planning and Control (WP&C) continues to mature, safety-related events/indicators continue to be observed in WP&C. These indicators relate to understanding operational limits, prompt notifications, and organizational response to incidents and other than normal operations. Engineered Safety is also continuing to mature. Sandia conducted ‘roll-out’ meetings to explain Engineered Safety to their workforce, developed implementation plans in every division and a corporate training course, and trained approximately 200 work planners. Sandia has devoted management attention and resources toward improving safety culture and trending analysis, which has led to improved efforts to review safety related data and events for learning opportunities. The results of the increased management attention towards improving safety culture was demonstrated at the working level when Sandia self-identified a potentially serious issue where Line-led construction contracts lacked effective flowdown of safety requirements which could enable unauthorized work. Sandia's self-recognition of this issue and the

associated corporate corrective actions demonstrate management attention toward improving safety culture.

Sandia's National Environmental Policy Act (NEPA) organization provided effective management of required process activities despite Sandia's internal review and approval process that has resulted in lengthy delays in document handling. However, opportunities to improve line management's recognition of the need to engage with the NEPA organization earlier in the decision process exist (e.g., BSL-3). Sandia utilized the Joint Operating Requirements Review Board process to identify potential enterprise-wide impacts related to the order and standards implemented in DOE Order 420.1C, which have been shared through the Energy Facility Contractors Group, and is developing an implementation plan to address the impacts. Lastly, Sandia maintained compliance with environmental regulatory requirements in the air and water quality areas with the following exceptions: deficiencies in the storm water area; inadequate scoping resulted in initiating a construction project without first obtaining two required environmental permits; and a required emergency diesel test was not performed on schedule, resulting in a Notice of Violation from the City of Albuquerque.

Sandia exceeded expectations in the delivery of effective and efficient management of legal risk and implementation of best practices as demonstrated by the fact that no new significant litigation cases were filed against Sandia, the number of overall cases remains at a sustained low level, and outside counsel litigation costs are significantly below costs incurred by comparable organizations. Based upon litigation lessons learned, Sandia revised specific corporate policies, processes, and procedures, and using in-house legal resources provided training to targeted sectors of the organization and legal support to the Laboratories' standing committees and councils, to effectively mitigate legal risk to Sandia and DOE/NNSA. At the request of DOE/NNSA, Sandia's Chief Privacy Officer led a DOE/NNSA working group to address agency-wide Personally Identifiable Information issues. Of particular note, Sandia also provided outstanding support to the federal government in U.S. v. BP (Deepwater Horizon), U.S. v. Huang (criminal case), and U.S. v. 9.345 Acres of Land (Strategic Petroleum Reserve Bayou Choctaw condemnation).

Sandia continues to improve the delivery of efficient and effective management of a quality assurance system and decision-making model framework. Sandia achieved or sustained third-party quality certifications in over 15 areas. However, actions to verify and validate necessary Corporate Quality Assurance (QA) improvements remain incomplete. For example, Sandia has had difficulty demonstrating QA requirements are properly implemented across the laboratory and that implementation results in systemic improvements. While evidence suggests isolated examples of QA improvements during FY 2013, these examples appear to be driven by localized need rather than by corporate performance assurance.

Sandia continues to improve the utilization of a comprehensive, transparent, and integrated Contractor Assurance System (CAS) and continues to mature contractor assurance across Sandia. Several areas at Sandia that effectively utilize the CAS such as S&S, Technical Area 5 (TA-V), and Business, but effective utilization and integration across all organizations (e.g., credible self-assessments, effectiveness and efficiency measures/indicators, issues management, and lessons learned) has yet to be fully demonstrated. While positive efforts have been shown such as increased assessment outreach, training, sharing best practices, and development and use of metrics have contributed to improvement, Sandia continued focus is needed in order to demonstrate effective utilization of CAS across all Sandia organizations. However, Sandia exceeded expectations through increased assurance mentoring, coaching, training and discussions through the Assurance

Communities of Practice, which are very positive methods of improving assurance awareness and use across Sandia. In addition, the Assurance Maturity Assessment process has been institutionalized and is a good tool for measuring assurance implementation across all entities. It is being used as a model for the Quality Maturity Assessment.

Sandia reduced the nuclear footprint to TA-V. Sandia coordinated with the Waste Isolation Pilot Plant and Idaho National Laboratory to establish pathways offsite for no-defined-use material; implemented the NA-1 SD Guide 1027 Supplemental Guidance expediting their ability to perform movements of Hazard Category 3 (HC3) material in support of nuclear footprint reduction; relocated all HC3 material to TA-V, eliminating the requirement for onsite HC3 transportation and Manzano Nuclear Facilities to remain categorized as nuclear facilities; and established the capability for Sandia to re-categorize the Auxiliary Hot Cell Facility one year ahead of the planned completion date.

Sandia reduced the quantity of legacy chemicals, energetic material, rocket motors, and explosives. Specifically, Sandia safely disposed 53,000 lbs of rocket motors; removed ~47,000 lbs of chemicals, 16% of which were 10 years old, or older; and disposed over 37,000 lbs of explosives. Sandia also implemented processes to efficiently reduce the quantity of legacy material onsite and completed the shipment of eight expended plutonium isentropic compression experiments shots offsite.

Sandia implemented the Long-Term Monitoring and Maintenance Plan (LTMMP) requirements for the Mixed Waste Landfill within the agreed upon schedule negotiated with the New Mexico Environment Department. In doing so, Sandia exceeded expectations by preparing the installation plan for the remaining components of the monitoring system and put contracts in place to allow for rapid execution of the LTMMP requirements well in advance of the anticipated LTMMP approval date. Also, Sandia prepared NEPA documentation for implementing the LTMMP, and went beyond expectations by including the next three years of routine activities to be conducted under the entire Long-Term Stewardship Program, maximizing the effectiveness of the NEPA review process.

Performance Objective 5: Contractor Leadership

Narrative Summary

Sandia demonstrated leadership across the National Security Enterprise (NSE) in their support of the DOE/NNSA mission. Sandia led teams and councils, collaborated on critical issue solutions, and implemented best practices and industry standards where applicable. Throughout FY 2013 Sandia underpinned DOE/NNSA critical capability with world class research and development for the interagency work. Evidence of Sandia's success is evident in the awards and benchmarked activity across the NSE. There was responsiveness of the leadership team to issues and opportunities for continuous improvement internally and across the Enterprise, though some of this was externally (DOE/NNSA) influenced. Parent company involvement to support the overall success of the Laboratories was noted, though the impact of that engagement on the Enterprise is not evident.

EOY Adjectival

Very Good

Considering Strategic Vision, Sandia co-led, with the DOE/NNSA Sandia Field Office, the development of a dry run self-assessment process for the FY 2013 Strategic Performance Evaluation Plan. Sandia conducted a complex-wide Management and Operating (M&O) contractor lessons learned of the DOE/NNSA Mid-Year Dry Run process and identified best practices which refined the end-of-year process.

Sandia aligned their five-year Strategic Objectives with the Key Goals from the DOE/NNSA Strategic Plan to provide a stronger link with their day-to-day activities. Sandia delivered national leadership to evaluate strategic direction for national security efforts. Sandia provided engagement in advisory bodies such as the Department of Defense's (DoD) Threat Reduction Advisory Committee, offering independent advice and recommendations related to combating Weapons of Mass Destruction, National Academy of Science, U.S. STRATCOM Strategic Advisory Group Science and Technology Panel.

In recognition of Sandia's capabilities in Enterprise leadership and at the request of the DOE General Counsel, Sandia's E-Discovery Team led a DOE-wide working group to develop Departmental capability complying with the e-discovery requirements of the Federal Rules of Civil Procedure.

Sandia assumed the Executive Director role of the DOE Contractor Financial Management Alliance from Idaho National Laboratory enabling Sandia to lead best practices and benchmarking activity for the Enterprise. Additionally, Sandia assumed leadership roles in the Supply Chain Management Council, in concert with the Kansas City Plant, and several integrated contractor purchasing teams.

Sandia mitigated the national trend of rising healthcare costs by \$700K through innovative wellness programs and program redesigns, sharing these program approaches across the NSE. Additionally, in the benefits area, Sandia continued implementation of the Total Compensation system to align Sandia with industry comparators and ensure an equity-based, performance-focused compensation system.

Sandia fostered Long Term Partnerships by achieving Critical Decision 0 approval for the Collaboration in Research and Engineering Advanced Technology and Education (CREATE) Project reinforcing the Sandia and Lawrence Livermore National Laboratory (LLNL) partnership through the Livermore Valley Open Campus (LVOC) master planning effort. Sandia also enhanced Laboratory partnership by increasing private sector and broader scientific community engagement at LVOC while maintaining compliant security performance.

Sandia developed a new licensing process that streamlines interactions with industrial partners to promote licensing of technologies to help launch technology transfer and commercialization. This process has been made available to the Enterprise. Sandia served as the lead DOE Laboratory to facilitate Multi-Lab Licensing Administrator Working Group for Industrial Partnerships to discuss issues dealing with the administration aspect of licensing, processes, due diligence, training and education, data collection and archiving, and networking amongst the other 18 DOE laboratories. In addition, Sandia developed a new partnership administrative tool to expedite processing, administration, and archiving of Cooperative Research and Development Agreements (CRADAs) by integrating Sandia user groups (legal, licensing, processing, and CRADAs). Sandia established an MOU with the University of Illinois at Urbana Champaign creating a strategic partnership in computer, information and nanosciences, cyber security, and complex systems.

Sandia increased the level of interactions with the United Kingdom for Nuclear Weapon support and the review between the two programs. This effort has led to a more robust peer review program and increased communication on lessons learned that has been beneficial to both sides.

With respect to Accountability and Responsibility, Sandia encouraged improvements to the Laboratories performance culture (e.g., promoted Engineered Safety and the Safety Conscious Work Environment training across Sandia). However, these efforts are still maturing and significant changes in these areas have not yet been realized. Sandia is making headway in the areas of “Just Culture”, behavioral expectations, and human performance indicators (HPI) through training, multi-method laboratories communications (e.g., all hands, laboratory-wide e-mails, video streaming, etc.). There is a noted improvement in line management ownership.

Sandia continues to lead in the area of Interagency Integration. Sandia has advanced the U.S. goal to deploy a Conventional Prompt Global Strike system while enhancing Sandia National Laboratories' core capabilities, including briefings to the Congress and the White House on these capabilities. In an austere and uncertain budget environment, Sandia excelled in leveraging and integrating interagency work to support the DOE/NNSA core mission areas, while also meeting the critical needs of non-DOE organizations to ensure advance technologies are used and developed to counter emerging threats and support the warfighter.

In the area of creating a Work Environment for effective safety and security, Sandia has provided Enterprise support in some key areas. Sandia has maintained portions of the Technical Area V to serve as a training platform to foreign nationals in support of NA-20 and to enhance nuclear material security throughout the NSE and abroad. The Sandia Pulsed Reactor/Critical Experiments (SPR/CX)

is used to support hands-on training in Criticality Safety for the DOE Enterprise and foreign nationals – unique in all of DOE.

Sandia worked selflessly to achieve Enterprise Solutions in a number of areas, in particular, in business systems. Sandia developed a gross receipts tax strategy, and met with the DOE/NNSA, Los Alamos National Laboratory (LANL), and Kansas City Plant to share Sandia's strategy for complying with the New Mexico Gross Receipts Tax system. This approach has recovered \$19M in tax overpayment in the last two years. Sandia achieved validated cost savings and efficiencies of \$79M, exceeding the FY 2013 target milestone of \$15M. Lastly, Sandia led the NSE pension fund management by improving the funded status of its Defined Benefit plan and keeping costs low. Sandia shared its best practices with the Contractor Financial Management Alliance (CFMA), and engaged with LANL and LLNL retirement administrators regarding plan operations.

Sandia demonstrated Professional Excellence as indicated by some notable awards. The Sandia Laboratories Director was awarded the Laboratory Director of the Year by the Federal Laboratory Consortium for support of Sandia's technology transfer activities and for maintaining a strong technology partnerships program with industry, academia and other national laboratories. Sandia earned several awards including four "R&D 100" awards, a Secretary of Energy Achievement award, the DOE Classifier of the Year award, a Federal Laboratory Consortium Award for Excellence in Technology Transfer, multiple Engineer-of-the-Year awards, and awards for outstanding scientific achievement.

Sandia maintained a high level of communication with DOE/NNSA Leadership which was demonstrated when they formally identified the unacceptable risks associated with projected sequestration cuts to FY 2013 cyber security budget. In response, DOE/NNSA conducted an NSE review of impacts that resulted in reduced cuts to cyber security budgets at all sites. However, there were communication challenges with regards to programmatic direction and Freedom of Information Act requests, which negatively impacted the relationship between DOE/NNSA and Sandia. While the Sandia Laboratories Leadership Team was supportive in implementing the Earned Value Management System for the B61-12 Life Extension Program (LEP) at the Federal Program Managers direction, Sandia did not provide the corporate tools and leadership necessary to adequately fulfill their role as LEP integrator in the NSE. Sandia did not meet expectations regarding the release of Issues G and H due to communication issues with DOE/NNSA, Los Alamos National Laboratory (LANL), and the Project Team regarding the technical content identified in Issues G and H. Sandia released Issue H to resolve several safety enhancements that arose during the Issue G Peer Review. However, the miscommunication regarding the technical content identified in Issues G and H between DOE/NNSA, Pantex, LANL, and the Project Team initiated a Code Blue and the duration of the resolution caused a delayed resumption of W76 operations at Pantex. Lastly, there was a lack of Sandia leadership in subcontract management, specifically consultant agreements. Overall, Sandia has a very capable leadership team, but improvement is needed in the development, maintenance, and sustainment of the relationship between Sandia and DOE/NNSA as well as in the review of subcontract management practices.

Sandia continues to Leverage Management Assurance Systems for the benefit of the Institution. Sandia implemented a parent company best practice to achieve not only better space utilization but significant energy cost avoidance. Sandia leveraged a Lockheed Martin Corporation best practice, executed a data center consolidation strategy that achieves better space utilization and energy efficiencies with funding from cost savings. Sandia also utilized a variety of survey tools to assure that the changes being made at the Laboratories are providing the desired results.