National Nuclear Security Administration

Sandia Corporation

Fiscal Year 2015 Performance Evaluation Report (PER)

NNSA Sandia Field Office

Performance Period:
October 1, 2014 - September 30, 2015

Date: November 19, 2015

Executive Summary

This Performance Evaluation Report (PER) provides the assessment of Sandia Corporation's (Sandia) performance for the period of October 1, 2014 through September 30, 2015, as evaluated against the objectives defined in the Fiscal Year (FY) 2015 Strategic Performance Evaluation Plan (PEP). The Department of Energy's (DOE) National Nuclear Security Administration (NNSA) took into consideration and consolidated all input provided [e.g., Contractor Assurance System (CAS), Program Reviews, peer reviews, external reviews, customer reviews, etc.] from NNSA Program and Functional Offices both at Headquarters and in the field. Sandia's self-assessment report, the Performance Evaluation and Assurance Report (PEAR), covered the rating period and was considered for this evaluation.

The Performance Objectives (POs) in the PEP were graded using adjectival ratings as described in the Federal Acquisition Regulation (FAR). There are comments on the performance of each Contributing Factor (CF) and Site Specific Outcomes (SSO) under each PO identified in the PEP.

The overall performance of Sandia during this rating period was outstanding, with several notable exceptions. The Laboratory earned performance ratings of Excellent in Performance Objective 2 (Reducing the Global Nuclear Security Threat Mission), Performance Objective 3 (Department of Energy and Strategic Partnership Project Mission) and Performance Objective 4 (Science, Technology and Engineering and other DOE Mission Objectives). These three mission areas predominately exceeded expectations of performance.

Sandia earned Very Good ratings for Performance Objective 1 (Manage the Nuclear Weapons Mission) and Performance Objective 5 (Operations and Infrastructure). Sandia exceeded many expectations and performed outstanding work in managing the nuclear weapons mission. The Very Good rating took into account this work as well as several challenge areas. The challenges included delays in surveillance testing at the Weapons Evaluation Test Laboratory (WETL) and quality issues with the 8S actuators for the W76-1 Life Extension Program (LEP). The Very Good rating for infrastructure and operations acknowledges positive progress the Laboratory made in enhancing safety and security, but also considers the ongoing challenge of reducing incidents of security concern.

A Satisfactory rating was awarded for Performance Objective 6 (Leadership). The award of a Satisfactory adjectival rating is based on the positive work of Sandia leadership in the majority of the performance objective but largely degraded by the results of the Department of Justice investigation settlement based on allegations of improper use of government funds for lobbying activities.

PO-1: Sandia's performance in the area of Managing the Nuclear Weapons (NW) Mission (25% at risk fee) was rated as Very Good. Overall, Sandia Corporation (Sandia) was above NNSA expectations in managing the NW Mission. Sandia attained several important achievements in support of stockpile stewardship, including Advanced Certification material shots on the Z Machine, as well as other Z Machine studies in support of the National Boost Initiative (NBI) and Capabilities for Nuclear Intelligence (CNI). Sandia proactively managed issues that arose during B61-12 Life Extension Program (LEP) development activities without impacting the baseline plan and provided engineering support for multiple B61-12 tests, including numerous activities culminating in the successful Flight Test Development Unit (FTDU) #1 & #2 full system flight tests. Sandia's work on the W80-4 LEP resulted in the Nuclear Weapons Council approval to proceed to Phase 6.2.

Sandia did not meet expectations in the areas of surveillance testing at the Weapons Evaluation Test Laboratory (WETL) and production quality resulting in schedule delays for the 8S Actuators for the W76-1 LEP.

PO-2: Reduce Global Nuclear Security Threats Mission (15% at risk fee) was rated as Excellent. Sandia exceeded expectations in executing authorized global nuclear security mission work in a safe and secure manner to include the Non-Proliferation, Emergency Operations, and Counterterrorism missions. Sandia provided solid technical and programmatic support to NNSA's missions. Their efforts helped identify, protect, and secure nuclear material and aided in preventing the spread of nuclear and radiological material or other Weapons of Mass Destruction (WMD) technology.

PO-3: Department of Energy and Strategic Partnership Project Mission (20% at-risk fee) was rated as Excellent. Overall, Sandia exceeded expectations in pursuing and performing high-impact DOE programs and Strategic Partnership Projects (SPPs) that leverage, sustain, and strengthen unique capabilities, facilities, and essential skills that support both the DOE/NNSA mission and the broader national security mission. Sandia exceeded expectations by performing work within scope, budget, costs, schedule, and identifying and managing risks in order to provide timely and quality products and deliverables. Sandia made significant progress in improving Defense Systems and Assessment's (DSA) transparency, communications and partnering with NNSA, performing above expectations for the Site Specific Objective.

PO-4: Sandia's performance in the execution of Science, Technology, and Engineering (10% of at-risk fee) was rated as Excellent. Overall, Sandia exceeded expectations in maintaining a strong Science, Technology, and Engineering (ST&E) base in support of mission objectives. Sandia produced mission-enabling research and technologies that were above expectations and significantly benefited DOE/NNSA and the nation. Sandia implemented a research strategy that clearly aligns discretionary investments to support DOE/NNSA and other federal agency priorities. Sandia balanced research investments that yielded high quality, innovative technical solutions, positively impacting the NNSA mission and successfully transitioning technology to other government agencies and industry. Sandia demonstrated numerous advances in science and engineering, enabled by seven core research foundations. The Laboratory demonstrated multiple examples of highly relevant and transformative research and technology.

PO-5: Sandia's performance in Operations and Infrastructure (20% of at-risk fee) was rated as Very Good. Overall, Sandia met expectations to manage the safe and secure operations of the Laboratory while maintaining an NNSA enterprise-wide focus. Sandia demonstrated accountability for mission performance and management controls and assured mission commitments were met with high-quality products and services, and maintained excellence as a 21st century, government-owned, and contractor-operated facility.

Sandia met or exceeded expectations in the areas of: environment, safety and health; capital projects; execution of the safeguards and security program; facilities, infrastructure and equipment; and business operations, legal management and cyber security. The overall safety, security and business operations of Sandia allowed for the Laboratory to meet and exceed many mission deliverables for the numerous customers of Laboratory products and services. Operating with budget challenges in a complex environment, Sandia successfully maintained operations and aging infrastructure to overall exceed NNSA performance criteria in support of the nuclear weapons mission, the reduction of global security threats, advancing strategic partnership programs, and achieving success in research and development.

Sandia was below expectations in one major area. The Laboratory experienced an increased number of major incidents of security concern. NNSA acknowledges that Sandia leadership has taken this challenge seriously and implemented numerous initiatives to address the issue. Despite these efforts, the Laboratory has not yet arrested the rate of security incidents in the area of information protection.

PO-6: The performance of Sandia National Laboratories leadership (10% of at-risk fee) was rated as Satisfactory. This rating is based on the positive work of Sandia leadership in the majority of the performance objective, but largely degraded by the results of the Department of Justice (DOJ) investigation and settlement based on allegations of improper use of government funds for lobbying activities. The allegations and subsequent settlement damaged the reputation of the Laboratory and the parent company. The new Laboratory Director and other senior managers demonstrated a commitment to improve transparency and partnership. Their actions acknowledging and implementing appropriate corrective measures were positive, but did not overcome the negative results of the DOJ investigation and settlement during this rating period. This performance objective would have received a higher adjectival rating except for the results of the DOJ investigation.

In FY 2015, Laboratory leadership demonstrated improved performance in the following areas: increased transparency across a number of programs; improvement of the conduct of laboratory self-assessments; and, the enhancement of Sandia assurance systems. Sandia continued sustained high performance in the areas of contributions to the DOE/NNSA enterprise and community engagement. Improvements continued in enhancing overall safety culture with the ongoing implementation of the Site-Wide Strategy for Safety Improvement Plan and the transition to Explosive Safety Centers of Excellence. The execution of the plan to create the centers of excellence presented challenges that slowed programmatic deliverables as noted in Performance Objective 1.

Performance Objective 1: Manage the Nuclear Weapons Mission

Summary

Sandia's performance in the area of Managing the Nuclear Weapons (NW) Mission (25% at risk fee) was rated as Very Good. Overall, Sandia Corporation (Sandia) was above NNSA expectations in managing the NW Mission. Sandia delivered important achievements in support of stockpile stewardship, including Advanced Certification material shots on the Z Machine, as well as other Z Machine studies in support of the National Boost Initiative (NBI) and Capabilities for Nuclear Intelligence (CNI). Sandia proactively managed issues that arose during B61-12 Life Extension Program (LEP) development activities without impacting the baseline plan and provided engineering support for multiple B61-12 tests, including numerous activities culminating in the successful Flight Test Development Unit (FTDU) #1 & #2 full system flight tests. Sandia's work on the W80-4 LEP resulted in the Nuclear Weapons Council approval to proceed to Phase 6.2.

Sandia did not meet expectations in the areas of surveillance testing at the Weapons Evaluation Test Laboratory (WETL) and production quality resulting in schedule delays for the 8S Actuators for the W76-1 LEP.

CF-1.1: Sandia exceeded expectations for accomplishing quality work while ensuring safe, secure, and cost effective operations. Sandia supported the new W88 Conventional High Explosive-Refresh (CHE-R) needs by reducing the B61 and B83 surveillance scope and decreasing W88 ALT 370 systems integration cost estimates by 10 percent. Sandia met 137 (97 percent) of the 140 NW Level 2 Milestones for FY 2015.

Sandia met expectations in apprising the NNSA of potential authorization bases impacts associated with Weapon Response-related changes or potential changes. The timely notifications enabled the NNSA to coordinate issues between the Laboratories and Consolidated Nuclear Services (CNS)-Pantex in a more efficient manner. Examples of timely actions included: the W76 Isolator, the B61 Issue A/B Weapons Response, and the W80/B61 Packaging Code Blue.

Sandia performed above expectations by leading the successful Scope Comparison of Options/Risks and Excursions modeling team for the Stockpile Stewardship and Management Plan. The Product Data Management (PDM) Link Team delivered over 99.8 percent application availability on both Sandia networks, ensuring availability to over 1300 license holders preventing unnecessary Need to Know (NTK) denials. Sandia also developed the Master Nuclear Schedule Program Control Document/Integrated Planning & Scheduling System Integration to minimize manual transcription of data and automated the process of disseminating directive schedule requirements.

Within a two-month window, Sandia responded to several disconnects relative to the Neutron Generator (NG) Enterprise (NGE) Budget by resubmitting the NG Integrated Program Plan (NIPP), including a Future Year Nuclear Security Plan (FYNSP) Management and Operations (M&O) requirements table matching their Enterprise Portfolio Analysis Table (EPAT) entries. This made the NIPP fully compliant with the new NNSA Enhanced Management B guidelines.

Sandia met expectations by completing 11 NNSA Office of Secure Transportation (OST) Task Agreements (TAs), with several Site Security Plan and Systems Analysis Project deliverables exceeding expectations. Sandia's Security, Training, and Risk Analysis Team (STRAT) stayed within budget yet

conducted analyses on subject matter expert (SME) input in several topical areas above and beyond the project plan. Analyses for OST included: development of OST-specific compensatory and contingency measures for convoy operations; supplementary aviation Vulnerability Assessment (VA); risk analysis of Consolidated Edison Uranium Solidification Program shipments; development, standardization, and training of tactical scenarios for OST Training Command during Operational Readiness Training events; SME input during the NNSA Enterprise VA peer working group; and development of an NNSA OST chapter-specific VA technical standard. Sandia demonstrated flexibility in project management by adding these VA tasks without impact to other analytic projects and tasks.

CF-1.2: Sandia met expectations in the area of increasing knowledge of the state of the stockpile, including completion of Cycle 20 Annual Assessment Reports and release of the Annual Assessment Laboratory Director letter that certifies the safety, security, and reliability of the NW stockpile. Sandia also met all Independent Nuclear Weapons Assessment Process requirements.

The W78 and W87 flight-test programs were above expectations for Sandia support and data analysis of the first instrumented extended range tests for the W78 and W87, which were both conducted within a one-week period. Sandia supported the W80 Joint Test Assembly (JTA) 3-CR high fidelity unit redesign that enabled cost reductions. Sandia took the initiative to establish a methodology to understand the risk of extending the life of weapon components and applied the new methodology to the W78. They finalized the Mk12A Payload Transporter Replacement and Payload Transport Type III test plans, and provided W78 JTA-7 leadership to define NNSA and Department of Defense (DoD) requirements.

Sandia experienced multiple issues that impacted testing at the Weapons Evaluation Test Laboratory (WETL): one centrifuge was unavailable for nine months; implementation of the explosives consolidation policy slowed operations; and cold testing capability on the new B61/B83 Tester was not established for a second consecutive year. Sandia mitigated testing schedule impacts by performing W87 tests instead of W78 tests, exceeding the new W87 testing goal by one, but missing the W78 deliverables. Although Sandia mitigated the impacts of delayed testing schedule, the Laboratory did not proactively coordinate the mitigations with NNSA. Sandia met all W80 surveillance deliverables except for WETL surveillance testing because of centrifuge unavailability. Sandia submitted a recovery schedule for the WETL backlog and anticipates recovery of W80 testing in FY 2017. Despite limited centrifuge availability, Sandia completed Principal lab tests on the B83-1, W87, and W76-0 at the end of the year to meet milestones. Sandia conducted an additional B61 Bench Command Disablement test, exceeding requirements for that milestone.

CF-1.3: Sandia met expectations for maintenance, production, limited-life components (LLCs), containers, and dismantlements. For the dismantlement program, Sandia made significant progress toward reducing legacy inventories of weapon parts. Sandia increased the H1616 shipping container design envelope using an analytical approach to avoid the cost and time associated with extensive qualification testing. Sandia met expectations (with the exception of the W80-1 ALT 369 production issues discussed below) for each of the stockpile weapon systems maintenance project deliverables and requirements within site budget allotments. Sandia met expectations for the W78 Authorization Basis for Weapon Repairs and proactively identified options supporting new tooling development. Sandia performed above expectations for the W87 by completing the “through-body cable” milestone and the W87 ALT 360 Baseline Design Review (BDR) ahead of schedule.

Sandia met expectations for the NG LLCs by completing the quarterly production and monthly NG deliveries for the W76, W78 and UK programs. Sandia exceeded some NG production goals by delivering 23 W88 development units in advance of FY 2016 and exceeding 18 planned builds for the Electronic NGs. While Sandia experienced several quality issues associated with W87 NG connectors procured at the National Security Campus (NSC), they mitigated the issues associated with increased cost and scrapped material to meet W87 NG deliveries to Pantex.

Regarding the W80 ALT 369 program, Sandia experienced production issues with the W80 Small Ferro-Electric NG (SFENG), resulting in a 16-month slip to the required First Production Unit (FPU) date. The inability to qualify the MC4886 detonator for the W80 SFENG resulted in NNSA re-baselining schedules and adding an additional detonator Qualification Evaluation (QE) lot. Sandia is now meeting the re-baselined W80 schedule. Sandia exceeded some equipment and infrastructure maintenance milestones and kept the NGE operational. Sandia is tracking NG activities focused on advancements for product trust, supply chain security, cyber security, and insider threat security. The Laboratory completed a pilot to adapt the Failure Mode Effects Analysis (FMEA) tool for Nuclear Enterprise Assurance (NEA) aspects by modifying the tool to consider failure modes due to subversion.

CF-1.4: Sandia exceeded expectations in demonstrating the application of new strategies, technologies, and scientific understanding, including completion of work on the Advanced Certification milestones related to Materials 5 and 6. Experiments were completed on the Z Machine and at the Shock Thermodynamic Applied Research (STAR) facility to support this effort. Sandia met Inertial Confinement Fusion (ICF) expectations by executing 30 ICF shots on the Z-Machine, including 12 fully integrated Magnetized Liner Inertial Fusion (MagLIF) shots. Sandia also exceeded ICF expectations by providing a high-resolution, radiation-hardened, high-speed, multi-frame hybrid Complementary Metal Oxide Semiconductor (CMOS) camera to the National Ignition Facility (NIF), where it was used to obtain time-resolved soft x-ray images on over 20 NIF shots in FY 2015.

Sandia exceeded expectations with regard to the Advanced Simulation and Computing (ASC) Integrated Codes (IC), Verification and Validation (V&V), Physics and Engineering Modeling (PEM), Computational Systems and Software Environment (CSSE), Facility Operations and User Support (FOUS), and Advanced Technology Development and Mitigation (ATDM) milestones. In the ASC PEM subprogram, Massively Parallel Molecular Simulations of a Chemically Reacting, Rarefied, 3D Re-Entry Flow (milestone) - SPARTA, a state-of-the-art Direct Simulation Monte Carlo (DSMC) code, was used to simulate the rarefied-gas velocity and temperature fields around a 3D re-entry body under high-altitude and high-Mach-number conditions. This new computational tool provides a fundamental capability for predicting re-entry vehicle performance in the rarefied flight regime with tighter margins and reduced uncertainties. SPARTA was demonstrated to make efficient use of 100 percent of Sequoia's 1.57 million processors, enabling DSMC simulations at sufficiently low altitudes to allow comparison to continuum aero codes. The Sandia ASC Program played a key role in the development of the B61-12 Environmental Specification 2.0, which relied heavily on ASC computational simulation capabilities.

CF-1.5: Sandia met expectations in sustaining and strengthening unique science and engineering capabilities and facilities. Sandia enhanced the capabilities of the Z Machine in several areas, including upgrading the Z Control Monitor software to a LabVIEW based system for faster operation/data collection, increased security, improved display and trending capabilities, and the ability to add new features and troubleshooting tools. In addition, Sandia conducted a tritium containment development experiment which demonstrated the ability to integrate the Z Machine Gas Transfer System into the

existing Special Nuclear Material containment system. Sandia increased the Z Beamlet energy from 2 kilojoules (kJ) to 4.5 kJ. Sandia experiments conducted on the Z Machine supported NBI efforts that were essential for future NW mission requirements. Sandia worked collaboratively and cooperatively with Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and NNSA to reshape NBI plans. Sandia also collaborated with LANL to complete joint CNI System2 experiments at the pRad facility, and with LLNL to conduct a joint hydrodynamic experiment on System2 at Site 300. System2 milestones were completed after explosive consolidation issues were resolved and CNI work resumed at the STAR facility.

Sandia met expectations for the Weapons System Engineering Assessment Technologies (WSEAT) program. Sandia obtained a detailed dataset to physically inform and validate simulations of a captive B61-12 inside of an F-35 weapons bay by acquiring simultaneous pressure data on a model store and measuring the resulting structural response using triaxial accelerometers. Additionally, Sandia completed the mechanical characterization study of a partial penetration 304L stainless steel laser weld. This characterization mimics the R3 cover to fireset housing laser weld in the W88 ALT 370 in support of development of predictive laser weld models for abnormal mechanical environments.

Sandia met expectations for the Nuclear Survivability program. The Laboratory completed a blind validation test of the W88 ALT 370 Small Scale Integrated Circuit (SSIC) and demonstrated a high fidelity radiation source with a reflex triode at the Saturn facility. Sandia also achieved and validated spectral and dose-rate environments in the completed InRad #1 facility, however, validation of InRad #2 and InRad #3 were delayed due to the unavailability of source material from another site.

Sandia met expectations for the Enhanced Surveillance (ES) program. Sandia successfully developed and matured new aging diagnostics at the component level and completed accelerated aging studies. Sandia successfully completed the room temperature Qualification Evaluation Report (QER) for the B83 configuration of the B61/B83 Common tester. Completion of the QER for stockpile-target-sequence (STS) cold environment testing requirements was delayed into FY 2016 due to the technological challenge of safely achieving the required temperatures.

Sandia exceeded expectations for the Enhanced Surety Program. Accomplishments included development of "Insider Threat" scoring guidelines as well as new features in the Use Control Architecture Trade Study (UCATS) Program (Pro) software, which allows the importation of specific information into the revised Joint Integrated Lifecycle Surety (JILS) Pro software, allowing for higher fidelity. Sandia performed excellent work by accomplishing the Highest Priority Mechanical Component milestone project, documenting design requirements, developing prototype concepts, and fabricating test coupons for new materials characterization. Sandia successfully completed all deliverables for development of the State Initiation Generator (STINGER) advanced switch milestone six months ahead of schedule. Sandia exceeded expectations for initial design concepts developed for the next insertion customer requirements, which combined two specific features into a single component. The Laboratory's progress developing a new version of JILS that includes prototype-graphing techniques for insider and cyber-attacks was exceptional.

Sandia effectively managed Readiness in Technical Base and Facilities (RTBF) Operations of facilities funds to ensure support of weapons testing and component production needs. An example of effective facility operations was the successful 10,000th shot at the High-Energy Radiation Megavolt Electron Source (HERMES) III facility. RTBF project work was well managed, with successful completion of the

Tonopah Test Range (TTR) Main (communications) Distribution Hub as well as several other projects at TTR and Sandia/New Mexico.

CF-1.6: Sandia performed above expectations for product realization processes and activities in support of LEPs and ALTs. Sandia exceeded expectations for the B61-12 LEP by proactively managing issues that arose during development activities and prevented impact to the baseline plan. As the B61-12 System Integrator, Sandia exceeded expectations by reducing integration risks associated with All Up Round (AUR) flight testing. The Laboratory aggressively worked with the Air Force Life Cycle Management Center (AFLCMC) to ensure the functional and physical integration of the bomb with the new Tail Kit Assembly (TKA), conducted two end-to-end tests to verify post release functionality, and provided valuable feedback on the TKA performance to the AFLCMC and their contractor (Boeing).

The Sandia B61-12 Design Agency (DA) successfully delivered Compatibility Test Unit Type 4s (CTU-4s) for testing in the F-15 Systems Integration Laboratory (SIL) and ground testing at Eglin Air Force Base (AFB). They also delivered the Type 3C and Type 3E trainers to the Sandia Military Liaison group in a timely manner to support assembly/disassembly operations and ancillary equipment evaluations. The Sandia DA shipped three additional B61-12 CTU-2s to Eglin AFB for the F-15 Captive Carry Tests to support validation of electrical interfaces for system flight testing. Significant accomplishments included the on-time shipments of FTDU#1 and FTDU#2 to support the first full system flight test and the first guided full system flight test.

Sandia completed most of the environmental ground tests for the B61-12 LEP, including Davis Gun, Rocket Sled Test (Imp 1), Cable Pull Down Test of the B61-12 Center Case (Impact1), Humidity Testing (Humid2), Thermal Testing (Ther2 WR and JTA), and Mechanical Vibration acoustic Testing (ME2 and ME3). While there were no impacts to the system milestones, Sandia worked on recovering schedule variance in technical basis testing that had delayed a few noncritical tests and test reports.

Sandia completed 30 of 38 major component BDRs. While several component BDRs were delayed in order to complete the baseline design documentation, preparations for the January 2016 B61-12 System BDR were not impacted. Emerging issues impacted the release/update of drawings and requirements for several components. However, Sandia managed the delays and prioritized resources to support the System BDR and the start of joint system tests in FY 2016. The Sandia DA also worked with the NSC to deliver the Joint DA/Production Agency (PA) Long Lead/Life-of-Program Buy (LL/LOPB) Procurement Plan and worked with the Product Realization Team (PRT) leads to ensure engineering releases were provided consistent with the LL/LOPB plan.

The Sandia DA led the effort to implement new NEA requirements for the B61-12 LEP. Additionally, Sandia worked with NNSA and other sites to support the U.S. Air Force (USAF) effort to develop an AUR Program Protection Plan (PPP). The Sandia DA and NSC hosted four professional Site Reviews, and Sandia led two very critical B61-12 LEP Programmatic and Technical Reviews.

The Sandia PA and LANL worked to resolve delays on the 8S and 12S actuators in order to ensure process prove-in deliveries met LEP schedule requirements. The impacts to the B61-12 schedule have been addressed by work-arounds. The Sandia PA is doing a good job communicating with the FPM and staff to inform them of issues as they arise. Communications between the Sandia PA and the PRTs regarding build schedules needs improvement.

Sandia met expectations on the W88 ALT 370 by executing the approved NNSA Integrated Master Schedule (NIMS). Sandia successfully completed the following tests: Abnormal Evaluation Mechanical Model Validation; Joint Lateral Impulse; Electromagnetic Transfer Function; Fire Thermal Validation; Abnormal Propellant Fire; Abnormal Fuel Fire; Radiation Requirements Validation; Mechanical Compatibility; and Electrical/Functional Compatibility. Sandia delivered development flight test units for the Follow-on Commander's Evaluation Test (FCET)-51 and Demonstration and Shakedown Operation (DASO)-26 for Navy flight tests. Sandia completed eight Major Components BDRs to meet the milestones in preparation for the Arming, Fuzing and Firing (AF&F) BDR. Sandia's improvements in the BDR process were recognized by NNSA and the Navy. Sandia is on track to complete the requirements traceability recovery plan for the BDRs/Final Design Review entrance criteria.

The Sandia DA exceeded expectations in working with NSC and Pantex in support of the W76-1 LEP. Examples of outstanding work include formulating a path forward to resolve the MC4710 Intent Strong Link (ISL) E-clip Seating and the MC4713 Launch Accelerometer (LA) Contact Resistance measurement failure issues, and multiple weapon response issues to prevent impacts to W76-1 LEP production. Sandia also analyzed the data received from the FCET-51 flight test of three W76-1 JTAs.

The Sandia PA performed below expectations for delivery of W76-1 LEP warheads to the Navy and did not meet program deliverables within budget and directive documents. The LANL DA tested the 8S Actuator subcomponents which passed the performance requirements, but during product acceptance testing, Lot 3 of 8S was rejected due to the component failing the all-fire timing requirement. The Lot 3 rejection caused unplanned cost growth to the LEP and required the transfer of schedule float from production schedules at other PAs whose components rely on the stability of 8S production. Based on this issue, Sandia's oversight of vendors is below expectations.

Sandia performed above expectations for the W80-4 LEP by accomplishing a higher quality of program work within the original cost and schedule limits. Sandia demonstrated key aspects of non-nuclear component and weapon system concept design development for Phase 6.1 study activities and supplied inputs to Project Officer Group (POG) subgroups and to the NNSA and DoD. Sandia also provided inputs to the Cost Improvement Initiative brief to focus technology maturation investments; provided input to the POG Phase 6.1 Report and Phase 6.2 Authorization Request; partnered with LLNL to develop a LLNL-SNL Detonator Stronglink Memorandum of Understanding delineating laboratory roles and responsibilities; developed a Phase 6.2 plan and schedule; and assisted NNSA in the development of the draft NNSA W80-4 LEP PPP. These activities culminated in the Nuclear Weapons Council approval to proceed to Phase 6.2.

Sandia met expectations for the Mk21 Fuze Program. Sandia successfully leveraged research and development expertise from the Navy's current program to mature the Arming and Fuzing Assembly. Sandia successfully implemented an effective Earned Value Management System (EVMS) that meets the United States Air Force (USAF) customer needs.

SSO-1.1: Sandia exceeded expectations in demonstrating the effective application of existing capabilities and development of new capabilities to support stockpile stewardship. The Laboratory exceeded expectations with regard to the milestones for ASC. Additionally, three Plutonium (Pu) experiments were completed on the Z Machine: a high-pressure Pu experiment, an asymmetric ramp compression Pu experiment that used an innovative design to increase the magnetic pressure at the load by 20 percent, and a Pu shock ramp experiment.

Sandia materials science experiments on the Z Machine included beryllium strength work, copper equation-of-state (EOS), and experimental campaigns supporting design of the improved Z Machine next generation containment system for future higher pressure materials work. Sandia conducted a copper cylindrical ramp experiment on the Z Machine in order to reconcile the differing LLNL and LANL EOS models for copper and also conducted a copper cylindrical imploding liner experiment. Sandia radiation/hostile environments science work met expectations in the area of assessing sources and improving diagnostics for greater than 15 kilo electron volt (keV) x-ray generation on the Z Machine.

Sandia work in the area of enhanced diagnostics for subcritical experiments (SCEs) and future neutron-diagnosed subcritical experiments (NDSE) at the U1a facility met expectations. Sandia completed work on Thor, the self-magnetic pinch (SMP) diode, and on optimizing Cygnus for reuse SCEs. Sandia supported the NNSA Analysis of Alternatives screening review and took a lead role in the design and engineering work supporting the NDSE efforts. Although additional enhanced diagnostics work supporting the national plan to achieve Critical Decision-1 (CD-1) for the U1a project experienced delays due to budget constraints, Sandia worked cooperatively with project partners (LANL, LLNL, and Nevada National Security Site [NNSS]) and kept NNSA well informed of issues.

Sandia implemented a number of diagnostics to improve data accuracy and reach new regimes of temperature, pressure, x-ray yield, and energy. Three key Sandia efforts in support of the National Diagnostics Plan were the high-speed hCMOS camera, a multi-layer Wolter microscope, and time-resolved x-ray diffraction. Sandia also developed and fielded the Axial Pinhole Imager in a 5-month period to support LLNL shots conducted on the Z Machine. Overall, Sandia conducted 140 shots on the Z Machine, including 30 Radiation Effects Sciences (RES) shots to develop advanced sources for the RES program. Sandia also demonstrated Z Machine operations at 90 kilovolts (kV), by conducting nine 90kV or higher shots on Z Machine (exceeding the milestone criteria of five 90kV shots), and provided extensive support for planning and conducting the FY 2015 ICF/HED Program Review. Sandia exceeded ASC expectations for tracking the Trinity contract activities and actively participated in various exascale planning workshops and document writing with the DOE Office of Science/Advanced Scientific Computing Research (ASCR). Sandia also provided international leadership, including establishing and leading the Sandia Fracture Challenge, which increased knowledge for modeling fractures and improved modeling for stockpile components.

SSO-1.2: Sandia performed above expectations for implementing EVMS and project controls tools. The B61-12 LEP exceeded expectations for implementation of project controls. The Sandia DA and PA each successfully completed an Integrated Baseline Review (IBR) of their project controls system and issued a formal and timely response to the NNSA IBR recommendations. The Sandia DA and PA also supported the first cost management boards for the B61-12 LEP and initiated unit cost tracking with the PRTs at component reviews. The Sandia DA exceeded expectations for overall implementation of EVM and used the data to effectively manage work. Additionally, the Sandia B61-12 Project Controls team shared EVM lessons learned across the Nuclear Security Enterprise (NSE) and other Sandia NW programs.

The Sandia DA and PA identified and managed risks in accordance with the B61-12 LEP Risk & Opportunity Management Plan; however, some mitigation actions were not documented or updated on a monthly basis. The Sandia DA and PA submitted monthly site reports, site EV reports, and site schedule updates to the NNSA. The Sandia DA and PA met expectations by completing the NNSA Burn-Down Plan to refine site contributions to the NNSA Integrated Master Schedule (NIMS) and completing

scheduled IBR actions. Several PRTs discovered disconnects of engineering hand-offs between DAs and PAs, resulting in potential schedule delays and poor logic flowing into the NIMS. Sandia worked with NSC to resolve disconnects in order to ensure that all handoffs are captured correctly and updated in the site schedules and that the logic correctly flows into the NIMS.

Sandia met expectations for implementing the EVMS for the W88 ALT 370 program by executing a large backlog of baseline change requests (100+) in the EVM tool. The number of backlog items was a leading cause for the delay in completing the W88 ALT 370 IBR. The Sandia DA and PA provided NNSA with monthly status reports on schedule. Although Sandia is on schedule for major system-level and component-level milestones, serious EV schedule variances ($25M) developed this first year. Sandia was unable to substantiate the variances to allow NNSA to assess how much the program is behind schedule. Sandia was slow in responding to financial data requests for the Quarterly Program Review in September. Sandia has shown leadership in managing the programs' risks by coordinating the Risk Review Board and challenging the quality of risk reporting analysis. Improvements are needed with regard to actively managing the handling strategies, identifying and maintaining risk costs, and driving overall risk levels downward.

SSO-1.3: Sandia performed above expectations for executing product realization processes. Some areas of the B61-12 LEP work scope exceeded expectations. The Sandia DA successfully planned hardware availability from over 40 PRTs and multiple sites and vendors to assemble and test over 20 systems tests. Sandia exceeded expectations in managing hardware for development testing, with one issue noted regarding damage to a mock CSA during posttest disassembly, for which the Laboratory promptly implemented improved controls. The Sandia DA led the successful completion of system level tests and test reports and was responsive and flexible in dealing with testing issues external to Sandia (e.g., aircraft availability, tailkit firmware changes) that arose with respect to joint NNSA and USAF tests.

Sandia released final versions of the B-2, F-15, and F-16 Vibration Fly Around/Instrumented Measurement Vehicle (VFA/IMV) reports and completed CTU-4 ground tests and the CTU-2 Captive Carry Test for both System 1 and 2 aircraft. Sandia supported preparations and testing of VFA/IMV flights for F-35 and NATO aircraft, as well as CTU-2 System 1 Flight tests and follow-up testing at Eglin AFB. Sandia prepared the FTDU#1, #2 & #3 Test Plans and led the test readiness reviews. Sandia successfully conducted FTDU#1 and #2 testing at TTR and completed preparations for FTDU#3 testing. The Sandia DA improved on the timely delivery of test plans and reports to NNSA.

Supporting system integration, Sandia updated the system level requirements documentation including V2.0 Compatibility Definition/Mechanical Envelope/Environmental Specification, and the Nuclear Safety Specification for the B61-12 LEP. Sandia released the Weapon Safety Specification and supporting documentation for Pantex assembly operations. The Laboratory also released Trainer and JTA requirements documentation. Sandia worked diligently to recover schedule variance associated with the release of Version 2 requirements. Sandia effectively led activities to update and review the New Material Stockpile Evaluation Program Issue B in support of the Baseline Cost Report. Sandia aggressively resolved issues in the Bomb-Assembly to Tailkit Assembly Interface Control Document (BTICD). The Laboratory worked diligently with the Air Force and Boeing to close issues, generate change notices, and coordinate with stakeholders. Sandia established a relationship with Boeing via a support engineer contract, which facilitated meaningful discussions regarding various technical issues.

Sandia successfully executed the activities for the W88 ALT 370 Phase 6.3, Development Engineering. Sandia aggressively designed, built, and tested prototype hardware. The Laboratory coordinated with vendors to ensure "design for manufacturability", enabled cost savings and met the NSC acceptable engineering release (ER) deliverable dates. Sandia transmitted ERs for LOPBs as scheduled. Sandia DA and PA met NNSA deadlines for baseline and monthly status schedules.

Performance Objective 2: Reduce Global Nuclear Security Threats Mission

Summary

Overall the Mission to Reduce Global Nuclear Security Threats Mission (15% at risk fee) was rated as Excellent. Sandia exceeded expectations in executing authorized global nuclear security mission work in a safe and secure manner to include the Non-Proliferation, Emergency Operations, and Counterterrorism missions. Sandia provided solid technical and programmatic support to NNSA's missions. Their efforts helped identify, protect, and secure nuclear material and aided in preventing the spread of nuclear and radiological material or other Weapons of Mass Destruction (WMD) technology.

CF-2.1: Sandia performed above expectations in providing security upgrades for radiological materials in the United States and overseas, exceeding their goals for FY 2015. Sandia provided superb technical expertise on topics relating to Radiological Dispersal devices, and expertly managed the "In Device Delay" hardening program. They also completed evaluation of Iridium-192 (Ir-192) as a proliferation sensitive material. This evaluation was valuable in helping the Global Threat Reduction Initiative establish a path forward on the security protection level for this material.

CF-2.2: Sandia performed above expectations in the area of safeguarding and securing materials, technology, and facilities. Sandia conducted physical protection assessments of foreign facilities holding U.S. obligated nuclear material at three sites in two countries. Sandia provided professional and timely contract support to safeguards activities in Ukraine by conducting field trials of an Enhanced Data Authentication system. Sandia hosted the 8th Permanent Coordinating Group (PCG) meeting with France and coordinated technology demonstrations and tours for the event. Sandia performed above expectations in completing a report on the application of surveillance technology in high-radiation areas for safeguards. Sandia enhanced the sustainability and effectiveness of the Middle East Scientific Institute for Security (MESIS), a regional nonproliferation partner in the Middle East. Sandia performed above expectations supporting multiple safeguards policy, concepts, approaches and human capital development projects with a focus on studies of safeguards at deep borehole repositories. Sandia exceeded expectations in foreign partner training by providing significant support for the China Center of Excellence (COE), India, and the Gulf Nuclear Energy Infrastructure Institute. They coordinated, hosted and taught nuclear security workshops in training for international partners, and integrated non-Sandia expert colleagues into workshops in order to most effectively meet sensitive counterparts' requests. Sandia built key relationships and provided consistently high-quality support on project activities delivering timely and comprehensive input on technical issues.

CF-2.3: For the International Nonproliferation Export Control Program (INECP), Sandia exceeded expectations in supporting the U.S.-Sino Technical Export Control Specialist (TECS) training for representatives from the Chinese Ministry of Commerce, the Chinese Customs, and the State Nuclear Security Training Center. Sandia exceeded expectations in the bilateral commodity identification training with the Government of Colombia which allowed the expansion of Colombia's previous participation in regional events. The Laboratory supported Pakistan engagement commodity identification Training and X-Ray Florence device operation training. Sandia strengthened the U.S. government's relationship with the United Nations Office on Drugs and Crime through the planning and delivery of Advanced Interdiction Training with regional partners. Sandia led the technical

planning and delivery of the U.S. government's initial Track-II engagement of Myanmar in the area of strategic trade controls. Sandia continued to offer experienced subject matter experts in support of DOE's partnership with the U.S. Department of Homeland Security (DHS) investigations to deliver technical capacity-building in Indonesia. Sandia provided a good briefing on international nuclear forensics to a Middle East meeting of nuclear measurement experts in Jordan for the International Nuclear Forensics Cooperation program. Sandia exceeded expectations by conducting informative and timely export control technical reviews in support of the U.S. Department of Commerce and U.S. Department of State export license applications. Sandia exceeded expectations conducting missile proliferation seminars and supporting WMD interdiction activities for Export Control Review and Compliance (ECRC)/Interdiction program. Sandia provided significant support to the Nuclear Smuggling Detection and Deterrence (NSDD) sustainability efforts, including work on equipment lifecycle analysis and sustainable communications. The Laboratory provided proactive communication with NSDD management and were very attentive to the NSDD future plans by offering initiatives to assist in achieving future goals and supporting the NSDD strategic review.

CF-2.4: Sandia exceeded most requirements and expectations for the Warhead and Fissile Material Transparency (WFMT) Program. Sandia exceeded expectations for agreement specific equipment development and for their leadership in U.S.-UK Portal Monitor for Arms Control Project and the Chain of Custody Equipment Mapping project. Sandia was the laboratory lead on a major project to re-engineer the Comprehensive Nuclear Test Ban Treaty (CTBT) Organization International Data Center (IDC). The Center integrates and analyzes data from the worldwide International Monitoring System which is designed to detect evidence of nuclear explosions. Sandia delivered software tools related to seismic event location that will improve seismic signal analysis for nuclear explosion monitoring. The Laboratory supported Source Physics Experiments, collecting highly calibrated underground explosive signatures that will be used to refine models. Sandia performed above expectations in the technical direction and supervision of the THOR I experiment and completed a classified logistics analysis algorithm which will have a significant impact with stakeholders. Sandia sent a strong group of experts to support the June CTBT Science & Technology 2015 Conference. Sandia exceeded many expectations, including responsive technical and programmatic risk analyses for NNSA that had major programmatic implications to assist in meeting future national security requirements.

CF-2.5: Sandia successfully supported the Nonproliferation Treaty (NPT) Transparency visit that showcased the Laboratory's role in the nuclear stockpile and nonproliferation efforts in 11 countries. Sandia met expectations for the WFMT Program by supporting follow-on activities for the CTBT large-scale on-site inspection (OSI) Integrated Field Exercises 2014. The Laboratory's expertise was an important part of the exercise's success.

CF-2.6: Overall Sandia met expectations in Emergency Management by completing the majority of Asset Readiness Management System (ARMS)-tracked, and Science and Technology deliverables on time. Several deliverables were delayed due to variables outside of Sandia's control. The delayed deliverables did not have any adverse impacts to the mission. Sandia addressed DOE Enterprise Assessment evaluation concerns while meeting Emergency Management Program objectives. Sandia met expectations in support of the Render Safe Program by executing assigned training events and supporting Joint Drill, Marble Challenge, Nuclear Weapons Accident/Incident Exercise (NUWAIX), Vital Archer, and technical training. Sandia exceeded expectations for the Stabilization Program by supporting training events, component training, and home teams. The Laboratory provided required personnel to support stabilization program execution and testing for the level V tools. Sandia met expectations for National Technical Nuclear Forensics/Pre-Detonation Program by maintaining

operational readiness for the Disposition Forensics Evidence Analysis Team (DFEAT). The International Emergency Management and Cooperation Programs at Sandia demonstrated exceptional performance, and exceeded expectations by developing and implementing the International Radiological Assistance Program Training for Emergency Response (IRAPTER) courses.

Sandia's Site Emergency Management program continues to meet expectations for overall performance regarding Planning, Preparedness, and Response. Integrated with the Sandia Safeguards and Security performance assurance system, the program adopted a more cogent approach to issues management and continued to show improvement in its ability to accurately identify weaknesses and measure program improvement. Despite improvement, the program has not yet adopted enhanced performance metrics. The program created a plan to remap critical requirements in order to develop more effective performance measures. The Sandia Emergency Management team has addressed longstanding weaknesses and is on track to meet corrective action related deadlines.

CF-2.7: Sandia exceeded expectations in performance and response that was ahead of schedule for the majority of expected research on Nuclear Counter Terrorism (NCT) task list items. The international support was well coordinated and executed with active Laboratory participation in multiple Nuclear Threat Reduction-related meetings. Sandia demonstrated strong collaboration and participation at Block 8-related meetings and events. Sandia performed above expectations in cooperation and collaboration for the post-experimental data collection and analysis of nuclear material shots on the Z Machine in cooperation with LANL. They proactively contributed to the tri-lab NCT High Explosives and Nuclear Materials roadmaps, which were used to guide national programs. The Laboratory's participation exceeded expectations in the Tier Threat Model Archives Validation (TTMA-V) Campaign 2 planning meeting, which supported the ongoing effort to predictively model disablement actions. Sandia provided superior work in managing the assessment of open source nuclear threat device information.

SSO-2.1: Overall Sandia has exceeded expectations by delivering the Global Burst Detector (GBD) payload systems; working on the launch of Global Positioning System (GPS) IIF payloads; building GPS IIIF payloads; and, developing GPS III Prime payload designs. Sandia delivered the 3rd GPS III satellite ahead of schedule and is on track for on-time delivery of the 4th unit. They successfully supported the GPS-IIF 9-10 launches and completed operational turn-on of the payloads with early-on-orbit testing. Despite a tight schedule, Sandia made significant progress on the next generation GBD III Prime non-recurring engineering development cycle. The Laboratory exceeded expectations in support of the NNSA-USAF schedule and requirements in delivery of Space Nuclear Detonations Mission-related capabilities and accelerated the schedule to complete the GPS IIIF 1-8 system ahead of the USAF schedule. This will reduce costs and allow for a smoother work force transition to the GPB-IIIF prime system.

SSO-2.2: Sandia actively worked with the Office of Nonproliferation and International Security and the International Atomic Energy Agency (IAEA) to host the 25th International Training Course on the Physical Protection of Nuclear Materials and Facilities. Sandia updated many of the training courses, provided a high level distinguished visitor kickoff, and hosted a successful course within budget, scope, and schedule.

SSO-2.3: Sandia met expectations supporting emergency and response operations for numerous incidents; managing and maintaining readiness for deployable response teams; providing training to emergency responders; supporting technologies and capabilities to support the NNSA emergency

response missions; and collaborating with NNSA program elements during the planning and execution of Sandia's annual full-scale emergency response exercise.

SSO-2.4: Sandia exceeded expectations by providing exceptional technical support to the NNSA High Energy Density Council, which plans out activities on the Z Machine. The Laboratory exhibited a strong collaboration with the NCT community in coordinating activities for material characterization efforts. Sandia performed above expectations in the execution of the nuclear materials characterization efforts on the Z Machine, in cooperation with LANL NCT and Capabilities for Nuclear Intelligence (CNI) representatives. The Laboratory acquired and analyzed data for the NCT program and performed this high priority task on time and within budget.

Performance Objective 3: DOE and Strategic Partnership Projects Mission Objectives

Summary

The performance of Sandia at meeting the DOE and Strategic Partnership Projects Mission (20% of at-risk fee) was rated as Excellent. Overall, Sandia exceeded expectations in pursuing and performing high-impact DOE programs and Strategic Partnership Projects (SPPs) that leverage, sustain, and strengthen unique capabilities, facilities, and essential skills that support both the DOE/NNSA mission and the broader national security mission. Sandia exceeded expectations by performing work within scope, budget, costs, schedule, and identifying and managing risks in order to provide timely and quality products and deliverables. Sandia made significant progress in improving Defense Systems and Assessment's (DSA) transparency, communications and partnering with NNSA, performing above expectations for the Site Specific Objective.

CF-3.1: Sandia exceeded expectations in the delivery of technical solutions and development of technologies that support various DOE applied energy and science programs, sponsored by DOE (non-NNSA) Programs. Sandia delivered high impact work that directly supports DOE strategic goals and objectives (Goal 1: Science and Energy and Goal 2: Nuclear Security). This DOE work strategically integrates with both the DOE and NNSA missions and leverages, sustains and strengthens unique science and engineering capabilities, facilities and essential skills in support of DOE/NNSA national security mission requirements. The Energy and Climate (EC) Program Management Unit (PMU) executed a new strategic plan focused on the Secure and Sustainable Energy Future mission area. The EC realignment and strategy provided a direct alignment of EC program areas with DOE customers and missions. The EC strategy is focused on five DOE customer-focused program areas, including: Renewable Systems and Energy Infrastructure, Nuclear Energy and Fuel Cycle Programs, Transportation Energy and Systems, Climate and Environment, and Energy Research. The actions identified below demonstrate Sandia is successfully executing this new strategy with long-range planning to support DOE missions, including DOE goals, objectives and a robust portfolio of focused energy and science research projects.

Sandia was selected to lead an industrial collaboration on the development of hydrogen powered ferries and refueling station infrastructures. Sandia established a Cooperative Research and Development Agreement with the Red and White Fleet in the Bay Area to develop a zero emission mass transit system. Additionally, Sandia's evaluation of crude-oil rail-transport system vulnerabilities contributed to national safety policy decisions. The evaluation also supported the development of a measurement technique that significantly improved the detection of small leaks, which helped monitor and preserve the integrity of the Strategic Petroleum Reserve. These efforts enhanced energy security by providing clean and reliable energy.

Based on the Laboratory's recognized expertise and knowledge of critical infrastructure protection, security and resiliency of electric distribution systems, cybersecurity, geothermal energy research, advanced drilling technologies, resource exploration, and enhanced geothermal systems, Sandia was selected as the lead laboratory for a Grid Modernization crosscutting effort and two geothermal technology projects. These efforts resulted in a grid security resilience strategic plan and improved drilling methods that will strengthen our nation's energy security. Additionally, Sandia received the Energy Secretary Award for state-of-the-science Earth systems modeling in support of the

Accelerated Climate Modeling for Energy (ACME) project, which directly supports White House Climate Action Plan initiatives.

Sandia exceeded the DOE's expectations in producing analyses that challenged U.S. assumptions about foreign threats. The Laboratory made significant contributions to the directed Nuclear Materials Information Program (NMIP) by participating in a statistical study of forensics data and a reactor modeling study of worldwide plutonium production reactors. Sandia excelled in all categories of its established performance measures pertaining to interagency intelligence work. The accessibility of Sandia's Field Intelligence Element (FIE) for addressing SIPP issues was impressive and demonstrates a dedication that the FIE is mission focused, and highly prioritizes customers' needs. The FIE Director and the FIE Staff provided valuable input to the DOE policies and have helped pave the way for a secure and efficient business environment for the Intelligence Enterprise. Sandia was selected to serve as one of the key DOE Labs to participate in the Director of National Intelligence (DNI) Technology Exposition. Sandia expertly managed eight diverse, high risk Intelligence Advanced Research Projects Activity (IARPA) projects.

CF-3.2: Sandia exceeded expectations by performing high-impact SPPs for a broad-range of non-DOE customers in order to counter current and emerging national security threats associated with broader national security missions. Sandia displayed exceptional breadth and depth of technical capabilities in performing this beneficial work. Based on the Mission Areas within Sandia's Strategic Plan, Sandia transitioned to a highly integrated approach for Program Management that effectively communicates, prioritizes, and shares the resources necessary to accomplish important national security work. Sandia leveraged their technical capabilities from the NW program to perform high-impact interagency work. This critical SPP work supports the capabilities needed to accomplish the DOE and NNSA mission. Examples of SPP technology areas that directly support the primary NW mission include: space flight systems, counterfeit part detection, supply chain management, advanced modelling and simulation, secure communications, advanced manufacturing, persistent situational awareness, and sensor development.

Sandia provided unique capabilities and innovative solutions to support the DoD warfighter and DoD strategic assets. Significant accomplishments in this area include working with multiple DoD and contractor organizations to successfully transition in-theater Copperhead Improvised Explosive Device detection equipment and sub-contractor personnel to the Army while providing continuous operational support to the warfighter; developing the design, specifications, and supporting architecture for a DoD capability to detect, track, and recover teams that are operating in hostile environments; providing physical security support and analysis to develop and deploy new technologies to secure NW assets; and conducting feasibility and risk reduction studies for the Low Cost Missile defense to augment the U.S. Ballistic Missile Defense System in protecting strategic assets. These high-impact projects contribute to protecting the warfighters securing and protecting national assets.

Sandia applied world class technical expertise for the DoD and other federal agencies' national security missions. Examples include the upgrading of space based sensors, the development of GPS encryption technology, ensuring supply chain reliability, and improving the effectiveness and efficiency of physical, wireless, and cyber security systems. These efforts strengthen national security by providing federal decision makers reliable information, securing military communications, and ensuring parts and equipment are trusted and reliable.

Sandia developed high-fidelity Reactor Core Isolation Cooling system models, improved radionuclide dispersal consequence codes, and developed simulation capabilities for the Department of Homeland Security. These models and codes improved our capability to assess the safety and reliability of nuclear power plants, enhance consequence assessments, and accurately assess infrastructure threats. These contributions improved national security and enhanced protection to the public.

Sandia developed an explosive destruction system; completed ammonium nitrate detonation technical assessments; and provided Ebola biosecurity risk assessments and computer simulations. These applied technologies neutralized stockpile chemical munitions; helped regulate the sale and purchase of ammonium nitrate; and determined post-outbreak laboratory needs to establish Ebola diagnostic laboratories. These efforts reduced chemical weapons, enhanced public safety, and minimized Ebola outbreak due to pathogen storage controls, thereby reducing security risks and increasing homeland security.

CF-3.3: Sandia exceeded expectations by accomplishing work within budget, scope, cost, schedule, and by identifying risk and tailoring projects to deliver high-quality technology solutions based on current and emerging national security needs. Sandia executed SPP projects that enhanced and maintained critical competencies and capabilities needed to support DOE and NNSA missions as demonstrated by Sandia's Management Assurance Systems, management reviews, and customer feedback. To minimize the risk to customers' programs, Sandia routinely worked with strategic partners to define and/or redefine project requirements, expectations, scope, schedule, milestones, and deliverables based on customer timelines, available funding, or technical issues. Despite changing project requirements based on project results, Sandia demonstrated flexibility and a commitment to excellence toward the customers' programs by adjusting tasks, schedules, and workloads based on the challenges and uncertainty associated with state of the art, high-impact work. In addition, Sandia used an agile matrix approach for managing work, which accommodates programmatic technical needs and reduced programmatic risk. SPP customers commented that they appreciate Sandia's openness, responsiveness, and expertise in developing requirements, and proposing resourceful solutions to align with programmatic objectives and resources.

SSO-3.1: Overall Sandia performed above expectations in improving transparency with the NNSA's Sandia Field Office. The EC, and International, Homeland, and Nuclear Security (IHNS) PMU continued to exceed expectations as they improved their Management Assurance Tools. The DSA PMU is above NNSA expectations due to their demonstrated commitment and approach to improve communications, reporting, and partnering with NNSA by providing transparency into their programs, as well as developing and improving their Management and Mission Assurance Tools.

DSA actions under new leadership represent a substantial improvement toward communications, transparency and partnering. DSA leadership was instrumental in changing the organization's culture to recognize that improved partnering and communications with NNSA was an area that required improvement. As a result, the DSA PMU, which has the largest SPP portfolio, made significant improvements toward this Site Specific Objective. NNSA observed an increased willingness by DSA to communicate and involve NNSA in business and operational strategies and plans, as well as participation in various levels of management reviews, customer reviews, tours and demonstrations. DSA communicated to NNSA their plans to modify their internal Mission Assurance Tool to explicitly address cost, schedule, and performance for all 400-plus projects, and to investigate and pilot the use of a corporate management assurance reporting tool. The sharing of DSA information and

documentation, as well as SPP strategies and plans for management assurance, was useful in providing NNSA information regarding the SPP portfolio.

Performance Objective 4: Science, Technology, and Engineering (ST&E)

Summary

Sandia's performance in the execution of the Science, Technology, and Engineering (10% of at-risk fee) was rated as Excellent. Overall, Sandia exceeded expectations in maintaining a strong Science, Technology, and Engineering (ST&E) base in support of mission objectives. Sandia produced mission-enabling research and technologies that were above expectations and significantly benefited DOE/NNSA and the nation. Sandia implemented a research strategy that clearly aligns discretionary investments to support DOE/NNSA and other federal agency priorities. Sandia balanced research investments that yielded high quality, innovative technical solutions, positively impacting the NNSA mission and successfully transitioning technology to other government agencies and industry. Sandia demonstrated numerous advances in science and engineering, enabled by seven core research foundations. The Laboratory demonstrated multiple examples of highly relevant and transformative research and technology as described below.

CF-4.1: Sandia's research investments are clearly aligned with their research strategy. The quality proposals resulting from the FY 2016 Laboratory Directed Research and Development (LDRD) Call for Ideas demonstrated sound alignment of research investments with both Laboratory Mission Areas (MAs) and Research Challenges (RCs). Analysis of Sandia's research strategy and a NNSA formal review of the LDRD program validated that Sandia's investments in LDRD are well balanced across all mission priorities, resulting in impactful research results. Sandia performed well on 380 LDRD projects totaling $149 million, with a majority of these projects developing technologies that benefit the DOE/NNSA mission areas, such as microelectronics, secure communications, modeling and simulation, additive manufacturing, and counterfeit detection. Sandia's research strategy was validated through six LDRD Grand Challenge Executive Advisory Board reviews, one mission area LDRD review, and seven research foundation reviews conducted in FY 2015, all of which identified high quality research aligned with Sandia's RCs and strategy. This represented an effective use of LDRD dollars to enable research and development (R&D) and build critical capabilities and skills. Additionally, NNSA's programmatic review of Sandia's LDRD Program identified that it was well managed, effective, efficient, and in compliance with DOE Order 413.2B.

CF-4.2: Sandia exceeded expectations by ensuring their research was relevant, enabled national security missions, and benefited the NNSA and the nation. The Sandia silicon fabrication facility successfully began their largest production series in history, producing base silicon wafers for war reserve-quality Application-Specific Integrated Circuits (ASICS) for the B61-12 Life Extension Program, W88 Alt 370 and W87 Mk21 Fuze Replacement nuclear weapon modernization programs. The Compound Semiconductor MicroFab continued refining the design for the heterojunction bipolar transistors (HBTs), which are used in small scale integrated circuits (SSIC) in the nuclear weapons stockpile. Sandia's technology development investments enabled new manufacturing tools and processes for Sandia's Microsystems Engineering and Sciences Application (MESA) facility, including 2-D marking, an electronic production control system, automated lot acceptance support systems, streamlined quality management, and a greater focus on preventing defects to support the stockpile modernization.

The Sandia-developed WeaselBoard™ technology (programmable logic controller exploit detection) was successfully integrated into a land-based version of a Navy ship control system as well as into the

navigation system of the USS Ronald Reagan. The WeaselBoard™ device is designed to detect anomalies, providing an added layer of cybersecurity to the controllers that direct the ship's essential functions (e.g., heating, mechanical, and electrical). Enabled by Sandia engineering and material science breakthroughs, Sandia received Classified Innovator Awards for two mission critical DoD projects that provided game-changing and mission essential technologies for classified defense applications and warfighter tactics.

Sandia acquired the first experiment images using the new ultra-high-speed, high-resolution, digital x-ray hCMOS framing camera at the Z Machine. This new instrument utilized an innovative and unique architecture that achieved shutter times as short as two nanoseconds by integrating separately fabricated x-ray sensitive photodiode arrays with a very-large-scale integrated circuit. Continued development of the hCMOS cameras is a major initiative of the National Diagnostic Plan and has positively contributed to Science Campaign high energy density (HED) experiments. Additionally, Sandia materials scientists issued a technical advance (TA) for technology that permits ceramic joints to be brazed without the use of preplaced filler metal or metallizing the ceramic surfaces. This is an important discovery since metallizing ceramic surfaces is a multiple step process involving several furnace operations at considerable time and expense. This work will reduce the number of steps required for ceramic-to-ceramic or ceramic-to-metal joint fabrication of metal joints and will also impact switch tubes and neutron generator braze joints.

CF-4.3: Sandia exceeded expectations in ensuring that their research is transformative, innovative, leading edge, high quality, and advances the frontiers of science and engineering. Sandia researchers invented a method to alter the thermal conductivity of PZT (lead zirconate titanate). This groundbreaking work demonstrated a means to control the amount of heat passing through a material at room temperatures by applying a voltage across it. This breakthrough enabled new technologies where controlling phonons is necessary, such as in improved heat dissipation in ASICs and energy storage devices. Sandia also developed technology based on digital in-line holography to provide a rapid and robust method for predicting the behavior of burning droplets of fuel. This technology is critical to hazard prediction and mitigation for scenarios such as fuel transportation accidents as well as a variety of other governmental agency missions.

Sandia researchers discovered inexpensive polymers that promise efficiencies in the operations of biofuel refineries, which exceeded expectations. The polymers are byproducts from the agricultural industry, biofuel plants, and pulp mills and allow for a closed-loop biorefinery as waste stream lignin can be reused to make bionic liquids. These results established an important foundation for alternative fuel solutions. Sandia exceeded expectations using a custom, Sandia-built continuous wave laser at 319 nanometers that elucidated a new method for creating entangling quantum gates in neutral cesium atoms. This science breakthrough significantly advances quantum sensing capabilities. Sandia's discovery of iron's role in inhibiting energy transmission from the center of the sun to near the edge of its radiative band has changed the way astrophysicists view planet formation, by obtaining data that revealed a discrepancy with solar models. The high-temperature opacity techniques developed as part of this Z Machine Fundamental Science program are being used to obtain data applicable to weapons-relevant materials. Sandia's radiation effects capabilities were advanced through x-ray source development experiments on the Z Machine, which were used to collect data to validate radiation effects models, as well as by the development of a new z-pinch x-ray source for the Z Machine. This development provided the first platform for experiments greater than 10 keV that can test radiation effects models in a photon energy range not previously possible.

CF-4.4: Sandia met expectations in its efforts to maintain a healthy and vibrant research environment. Sandia strengthened its capability base by actively recruiting technical and administrative professionals who produced impressive contributions that push the frontiers of science and engineering. Sandia established programs such as the Truman Fellowship that seek to attract the best nationally recognized Ph.D. scientists and engineers to pursue research that advances the Laboratory's national security missions. Two appointments were awarded among a field of 69 applicants. University partnerships providing research dollars for students working in targeted fields of interest yielded new employees who are making significant contributions in all areas of Sandia's research foundations. Early Career research programs designed to integrate new staff into programmatic work have also been effective. Sandia received a $2.5 million, five-year Early Career Research Program award from the DOE Office of Science for an impressive fundamental science proposal to develop new optical diagnostic tools to study interfacial combustion interactions that are major sources of pollution and vehicle inefficiency.

CF-4.5: Sandia exceeded expectations regarding the performance of R&D that resulted in: accomplishment of high priority, multi-year objectives; advances in ST&E; and creating technology for the public good. The Laboratory accomplishments have improved licensed technologies contributing to: job creation, economic growth, tax revenue, and economic competitiveness. Sandia exceeded expectations in technology partnerships that demonstrated increased local, regional, and state economic impacts through various Laboratory technology transitions and commercialization of technologies. Sandia's Science and Technology Park enabled new and successful technology transitions and commercialization of technologies. For example, completion of the Microelectronics Enabled Photovoltaics LDRD Grand Challenge project resulted in numerous patents that have led to commercialization endeavors with industrial partners.

Sandia is leveraging past LDRD work on the Micro ChemLab™ gas phase system to simplify its Explosive Destruction System (EDS). In collaboration with industrial partner Defiant Technologies, the EDS team is working on an in-situ vapor monitoring system, which is an offshoot of the Micro ChemLab™ gas phase system developed at Sandia. Chemical munition disposition processes have been simplified using this new technology, providing the ability to monitor for multiple chemical agents with a single system, and providing increased safety for munitions monitoring staff. WeaselBoard™ was also an outcome of past LDRD investments and has proven useful for critical infrastructure protection applications. Sandia is working with several industry partners to commercialize WeaselBoard™ under the Department of Homeland Security (DHS) S&T Technology Transition to Practice program.

Sandia received the 2015 Federal Laboratory Consortium (FLC) National Award for Excellence in Technology Transfer for BaDx (Bacillus anthracis Diagnostics). The "lab-in-a-pocket" device is used to sample, sense, and diagnose anthrax using Sandia licensed technology. Designed for use with minimal or no training and to keep handlers safe, the device requires zero power, no refrigerated storage, and no laboratory equipment. BaDx, initially funded as an LDRD project, is licensed to Aquila, a New Mexico woman-owned small business.

Sandia successfully resolved technical issues that delayed beta-test and execution of new Sandia Intellectual Property (IP) Manager System (replacement of Partnerships and Licensing System). The IP Manager System was successfully brought on-line in early June 2015 and is fully functional, providing IP Management and Licensing tracking and CRADA processing capability.

Performance Objective 5: Operations and Infrastructure

Summary

Sandia's performance in Operations and Infrastructure (20% of at-risk fee) was rated as Very Good. Overall, Sandia met expectations to manage the safe and secure operations of the Laboratory while maintaining an NNSA enterprise-wide focus. Sandia demonstrated accountability for mission performance and management controls and assured mission commitments were met with high-quality products and services, and maintained excellence as a 21st century government-owned, contractor-operated facility.

Sandia met or exceeded expectations in the areas of: environment, safety and health; capital projects; execution of the safeguards and security program; facilities, infrastructure and equipment; business operations, legal management and cyber security. The overall safety, security and business operations of Sandia allowed for the Laboratory to meet and exceed many mission deliverables for the numerous customers of Laboratory products and services. Operating with budget challenges in a complex environment, Sandia successfully maintained operations and aging infrastructure to overall exceed NNSA performance criteria in support of the nuclear weapons mission, the reduction of global security threats, advancing strategic partnership programs, and achieving success in research and development.

Sandia was below expectations in one major area. The Laboratory experienced an increased number of major incidents of security concern. NNSA acknowledges that Sandia leadership has taken this challenge seriously and implemented numerous initiatives to address the issue. Despite these efforts, the Laboratory has not yet arrested the rate of security incidents in the area of information protection.

CF-5.1: Sandia met expectations for delivering effective, efficient, and responsive environment, safety and health (ES&H) management and processes. Sandia's electrical safety and radiation programs continued to perform well based on solid assurance mechanisms that included balanced metrics, active committees, and effective transparency/interaction with the field office. Industrial Hygiene and Z Machine line management proactively worked with Z Machine line personnel to address and mitigate airborne beryllium exceedances to include extensive air monitoring and work observations.

Traditional safety metrics for the period were very good. The Days Away Restricted Transfer Case Rate (DART-CR) and Total Recordable Case Rate (TRCR) were 0.26 and 0.82 respectively, which are the lowest rates Sandia achieved in five years. The Facilities Management and Operations Center had no recordable injuries for construction activities resulting in a zero TRCR. Sandia discussed improving safety metrics by using more leading indicators, but has not yet implemented enhanced measures.

Sandia met expectations in the performance of assurance activities at Moderate Hazard Facilities. Previously noted issues with performance in Conduct of Operations for the Rocket Sled Track and Aerial Cable Facility showed a marked improvement and met expectations. Sandia completed a Conduct of Operations (CoO) review across the Laboratory and self-identified a number of findings related to the CoO matrices. The Laboratory developed a corrective action plan to rectify their CoO issues.

In an effort to improve safety of explosive operations and reduce the risk of mishap, Sandia implemented a new construct to improve the effective management of explosive operations. Sandia executed a plan to create three Explosives Centers of Excellence to provide a greater focus on the consistency of work planning and control across a wide array of explosives operations. Sandia added explosives safety to the Corporate Risk Matrix to ensure the Laboratory leadership team had transparency into this important safety area. The Laboratory successfully formed an Explosive Operations Board and reassigned personnel to align with the initiative. As noted in Performance Objective 1, Sandia experienced several issues with the implementation of the Explosives Centers of Excellence plan.

Overall, work planning and control met expectations with Division 5000 experiencing challenges in executing work planning and control. Division 5000 management met expectations in their efforts to improve performance and address issues such as the loss of a Polonium ionizer, issues related to the CAGE explosive site planning and facility design, and findings from their independent review of the Site-Wide Strategy for Safety Improvement (SWSSI) implementation.

Sandia met expectations in the area of Quality Assurance (QA). Sandia continued implementation and improvement of their QA program which includes the Suspect/Counterfeit Items (S/CI) program development, implementation of the Safety Software QA (SSQA) program, and upgrade of the Sandia Corporate QA Program Description.

Sandia met expectations by obtaining ISO 140001 recertification at both Sandia/New Mexico and Sandia/California. Re-certification ensures that environmental impact is being measured and improved. At Sandia, the Materials Sustainability and Pollution Prevention Program's (MSP2) team executed activities to reduce, reuse, recycle, compost, and buy green in striving for zero waste.

Sandia made progress addressing previously identified storm water compliance issues. The timeliness and quality of storm water program deliverables improved and the program meets expectations. Sandia personnel provided professional, and technically sound, testimony and evidence supporting DOE/NNSA and Sandia's permit modification request during a New Mexico Environment Department public hearing held July 8-11, 2015. The support to the public hearing increased the probability of completing corrective actions for the Mixed Waste Landfill.

Staffing changes in the Nuclear Criticality Safety (NCS) program improved overall performance. Sandia self-identified deficiencies in the NCS program and made tangible improvements. Sandia made favorable progress on the NCS improvement plan, which has contributed to an improved NCS program.

CF-5.2: Sandia met expectations in supporting the analysis of alternatives for the Livermore Valley Open Campus Critical Decision-1 approval process. Sandia is completing improvements to their minor construction program plan to address legacy issues that NNSA identified on project characterization.

To address alignment of the project planning process and NEPA requirements, Sandia initiated an effort to reduce unnecessary delays in project approvals. The effort to improve the process was not completed during this evaluation period.

CF-5.3: Sandia did not meet expectations in the area of information protection. The Laboratory

continued to experience high numbers of incidents of security concern (IOSC). In FY 2015, the Laboratory experienced 195 IOSC which was a slight increase from FY 2014. While low risk incidents have decreased, moderate and high risk Category A events increased by 50 percent. A number of the high risk events are attributable to the failure of employees to follow established corporate policy relative to classification reviews. Issues with Sandia's information protection program resulted in the DOE Office of Enforcement issuing a notice of violation with a significant fine for failing to adequately protect classified information. Overall, Sandia continued to be challenged by controlling information protection in an environment of expanded classified operations.

NNSA acknowledges the leadership attention and initiatives introduced by Sandia to alleviate the high rates of major security incidents. Once implemented, these efforts reduced overall IOSC rates and minor incidents. Sandia's Weapon Engineering Division, which significantly increased in both size and scope of work, partnered with the Laboratory's Safeguards and Security Division to develop and implement programs specifically designed to address information protection related events, and improved security culture. In addition to a deliberate security pause designed to refocus attention on security requirements, division leadership has implemented its own internal lessons learned program, and quarterly security forums. The pause resulted in 22 improvement activities being implemented to raise awareness of security requirements and common mistakes, recover a positive security culture, and improve security performance. The organization formed the Division 2000 Operational Excellence Center, with an Advisory Committee chaired by one of the division directors, and staffed by the Safeguards and Security Director. Similar activities are being conducted at the subordinate Center levels. At the executive leadership level, Sandia formed the Operational Excellence Advisory Committee (OEAC) to develop proactive strategies to improve operational excellence in security and safety. In aggregate, Sandia's actions reflect a concerted effort to improve information protection.

The safeguards and security program met or exceeded expectations in every formal topical and sub-topical area despite fiscal constraints in the safeguards and security budget. The safeguards and security program maintained a self-critical assurance program that exceeded expectations for transparency, rigor and formality. The excellent assurance program ensured the foundation for an effective security program and enabled an environment of continuous improvement. The security program introduced engineered enhancements in Closed Areas and developed associated training. This initiative reduced access errors in the over 160 areas where the engineered controls were installed. Sandia is leading a collaborative effort to develop and employ the newest Transport Layer Security protocols to improve the protection of communications and data transmissions between NNSA laboratories. The Laboratory's Safeguards and Security Division developed and deployed the Closed Area Management Systems (CAMS). The system reduced access incidents by monitoring training and access authorization to closed areas, creating access discrepancy reports, and analyzing closed area metrics.

CF-5.4: Sandia met expectations for Operations, Maintenance and Recapitalization program areas. Sandia provided timely and thorough information consistent with the NNSA Infrastructure Program Management Plan guidance and effectively communicated issues to the NNSA. Sandia continued to meet expectations for additional implementation phases of BUILDER, a sustainment management system. Sandia met or exceeded the Fiscal Year 2015 sustainability targets for energy intensity reduction, water intensity reduction, High Performance Sustainable Buildings (HPSB), renewable energy, and Energy Independence and Security Act (EISA) audits. Sandia provided technical expertise to the entire NNSA Enterprise, by sharing a Sandia program (Transformation IX), which is a powerful modeling tool to determine best energy-payback investments. Sandia began the effort to improve the

quality and timeliness of real estate actions, including recently identified lease procurement issues. Sandia completed the deliverables required by the NNSA heating, ventilation and air conditioning, and roof asset management programs on schedule. Sandia met expectations in executing the DOE-EM funded Environmental Restoration Operations Project per the annual work plan.

Sandia participation was critical to the progress of the Core-Infrastructure Risk Informed Strategic Planning effort. Sandia provided leadership and commitment to the effort that exceeded NNSA expectations. Sandia provided valuable lessons learned and feedback for implementation planning that was detailed and extremely informative.

CF-5.5: Sandia met expectations in human resources requirements. Sandia updated the Human Resource metrics after benchmarking against a Saratoga Custom Peer Group to improve alignment with industry and to create stretch goals to achieve greater efficiency. Sandia volunteered to assist the NNSA with developing a pilot program to improve the efficiency and visibility of Off-Site Extended Duty Assignments and was instrumental in developing this pilot designed to eliminate time-consuming transactional reviews and drive consistency across the NNSA. Sandia was extremely responsive and transparent during implementation of its first salary structure adjustment since execution of the Total Compensation (TotalComp) system. The updated structure aligns Sandia employees' salaries closer to the external market.

Sandia financial operations met most NNSA performance expectations. Sandia Budget and Strategic Partnership Projects worked closely and openly with NNSA to meet deliverables and avoid funding issues. Sandia successfully performed a Budget and Reporting recast and met NNSA deadlines. Sandia initiated a new, more efficient process and completed the recast in a very short time period. Sandia continued to capture and track cost savings/avoidances and the redirection of savings from process efficiencies initiated across the Laboratory.

Sandia's Cost Accounting Standards practices did not meet expectations based on repeat findings with Laboratory-wide labor charging issues and the treatment of material year-end service center variances. Sandia did not follow correct accounting treatment for prepayments and software capitalization. While rectified in September, access to supporting documentation for self-assessments was an issue during this performance period.

Sandia exceeded expectations by contributing approximately $53.8 million in strategic savings to the Supply Chain Management Center (SCMC) program, resulting in 6.75 percent savings against a goal of 4.27 percent. Sandia used SCMC agreements to purchase over $44 million of commodities, equal to a two percent increase from last year, and realized seven percent savings. Sandia increased the level of SCMC tool usage enabling savings. The Laboratory led the Complex with reported savings of approximately 34 percent of all SCMC strategic savings.

Sandia did not meet expectations with respect to NNSA procurement expectations, including actionable subcontract packages. Proposed procurement strategies, lack of adequate documentation, and insufficient responses to NNSA's comments contributed to unnecessary re-work for Sandia and NNSA. Sandia was responsive to NNSA's concerns in this area and plans to assess how to improve its processes and practices, beginning with a re-write of its procurement guidelines. Sandia continued to work toward improving its subcontract administration responsibilities by providing greater transparency into its official electronic contract files, but there are cases where critical contract administration documents are unavailable and inspection of work records are not being retained to

validate work being paid. Sandia did not complete its get-well plan to address the deficiencies under the Davis-Bacon and Service Contract Acts that resulted in Sandia subcontractors paying liquidated damages and back wages. This affected Sandia's ability to validate that correct wages are being paid for work performed by its subcontractors as required by the Davis Bacon Act. Sandia asserted that subcontract flow-down requirements have been resolved, but there is evidence that not all personal property requirements are being flowed down and property provided to subcontractors is not properly tracked. Prime flow-down requirements to subcontracts remain a concern.

Sandia continued to strive to meet its overall small business goals, but fell slightly short by 1.4 percent, awarding 50.6 percent of contract obligations to small businesses compared to a goal of 52 percent. Sandia met its lower level small business goals for HUB-Zone, service-disabled veteran-owned, and veteran owned. The Laboratory increased utilization of veteran owned businesses by 4.5 percent ($57 million) from FY 2014, achieving 9.6 percent utilization rate that exceeded its 4 percent goal. Sandia narrowly missed achieving the socio-economic goals for small disadvantaged businesses and woman-owned small businesses.

Despite Sandia's commitment to work with NNSA in updating the terms and conditions (Federal Acquisition Regulation and DOE Acquisition Regulation clauses) of the Contract in a timely manner, Sandia's interaction largely contributed to an 18-month delay in updating contract terms.

Sandia met expectations in Personal Property. Sandia was successful in its wall-to-wall property inventory, counting 99.75 percent of attractive items (goal 98 percent), 99.88 percent of equipment items (goal 98 percent), and 100 percent of firearms and precious metals (goal 100 percent). Sandia met the accuracy measure for its Fixed Assets Database with only one identified error (an incorrect serial number), and corrected a number of discrepancies between Oracle and the Government Furnished Property Tracker System.

Sandia met expectations in Information Technology (IT). Sandia corrected many of the National Archives and Records Administration concerns with the construct of a new records storage facility. The facility was completed one month ahead of schedule. Sandia completed and closed the corrective action plan for OIG/KPMG Finding 14-SNL-PT-01 (Configuration Management) on schedule. Sandia prepared "knock-out lists" to identify duplicate IT initiatives, potentially saving money and applying savings to high priority items. Sandia submitted planned milestones for implementation of IPv6 although the new completion date surpasses Sandia's initial plan to have IPv6 implemented at the conclusion of calendar year 2014. Sandia met the FY 2015 IT NNSA OCIO Guidance for Information Technology Goals, Objectives, and Implementation Factors.

Sandia implemented changes to the assurance information systems early in the fiscal year that negatively impacted NNSA access to information. The Laboratory created and implemented a plan that resolved the access issue.

CF-5.6: Overall Sandia met expectations by efficiently and effectively managing legal risk and incorporating best legal practices. Sandia effectively managed outside counsel and associated legal costs, generally meeting the requirements of 10 CFR Part 719, and was responsive to concerns raised by NNSA as to the reasonableness of hourly rates charged by some law firms. Over a period of several years, Sandia sustained a very low level of litigation, a noteworthy accomplishment considering the size of the workforce and the significant legal risks inherent in the complex operations of a major Federally Funded Research and Development Center (FFRDC). This achievement is likely the result of

several practices to include: the engagement of Sandia attorneys with Sandia management and staffers serving as advisors to numerous internal committees and advisory boards; and providing training to mitigate legal risks that could inhibit and undermine the ability of Sandia to meet NNSA mission requirements.

The DOE Inspector General (IG) and Department of Justice (DOJ) investigation substantiated the allegations that Sandia used appropriated funds to implement a strategy to influence federal officials to extend the Sandia contract without competition, in violation of law and provisions of the contract. Based on the results of the investigation, Sandia paid a substantial settlement to avert the filing of a Complaint under the False Claims Act. This represented a significant failure to meet the high standards of business integrity expected and required of an FFRDC as noted in PO-6. In this matter, Sandia's management of corporate legal risk was deficient and Sandia's internal controls to assure prudent expenditure of appropriated funds were not effective.

Sandia achieved a marked improvement in communications with the NNSA Patent Counsel and implemented very effective training protocols, positively advancing Sandia's intellectual property strategy.

CF-5.7: Sandia met expectations in delivering effective and responsive cyber security. The Sandia Cyber Security Assurance team demonstrated automated continuous monitoring (CM) tools a month ahead of schedule. These tools provide the near real-time status of vulnerability remediation and offer the potential to quickly identify cyber security control effectiveness issues. Sandia failed to meet NNSA mandated FY 2015 milestones for CM of select classified and unclassified cyber security controls at an enterprise level.

Sandia's Cyber Security Assurance Team demonstrated effectiveness through comprehensive and rigorous self-assessments and continually improving communications, collaboration, technical capabilities, and knowledge management. NNSA conducted shadowing of Sandia Cyber and Telecommunications Security self-assessments and identified a recurring issue with line performance previously identified in Sandia's FY 2014 Performance Evaluation Report. Corrective action validation efforts by Sandia Cyber Security demonstrated that many issues identified during FY 2014 assessments were not corrected by the line, and corrective actions had not yet been entered by line management into the Assurance Information System for FY 2015 findings as late as six months after issuance. As in FY 2014, Sandia Cyber Security is effectively identifying issues through its self-assessment processes that line elements are not addressing in a timely manner.

Sandia's telecommunications and automated information systems, i.e., TEMPEST Program, exceeded expectations. The Laboratory's program spans six states and required innovative methods of direct oversight in order to effectively monitor and manage the program. Sandia overcame its geographical challenge by bridging lines of communication between its corporate program managers and line appointed TEMPEST coordinators with the use of Lync, SharePoint, and recurring meetings. These actions led to a unified program that was continuously monitored, performance driven, and facilitated communication for the timely identification of issues, concerns, and dissemination of information, such as lessons learned and noteworthy practices. Sandia increased its technical capability by procuring test equipment that will facilitate converting its TEMPEST Program from a compliance driven program to a performance-based program.

Sandia implemented a computing cluster that can employ more than a thousand malware signatures to analyze immense stores of network sensor data to flag indicators of suspicious network activity. The Laboratory also deployed a new vulnerability management tool that provided the capability to fully scan all unclassified network servers and terminals every three days, a tenfold increase in scanning frequency for terminals and a fivefold increase for servers. Sandia continued to seek out a variety of forums to share its cyber security developments with NNSA, DOE and other federal entities, including presentations at the DOE Cyber Security Training Conference and the National Laboratories Information Technology Summit. Sandia effectively collaborated with Lawrence Livermore, Los Alamos, Pacific Northwest and Argonne national laboratories and the Kansas City Plant.

External audit teams have repeatedly identified vulnerabilities associated with obsolete versions of software on Sandia networks, and in some cases the same vulnerabilities are being identified on the same systems in audits spanning several years. Sandia did not meet expectations providing NNSA with documented assurance that vulnerable obsolete software on Sandia's classified and unclassified networks is appropriately mitigated.

SSO-5.1: Sandia continued to demonstrate a strong commitment to further the improvements for lifecycle management of hazardous material. Sandia improved the funding services for this program which led to increased disposal requirements by many Divisions. This year the disposition of radioactive materials increased in total pounds by 191 percent (78K lbs.). The disposition of explosives and chemicals increased in total pounds by 61 percent (33K lbs. of explosive waste and 803K lbs. of chemical waste). Sandia's rocket inventory was significantly reduced, thereby reducing hazards associated with long term storage.

SSO-5.2: Sandia line organizations continued to experience an increase in major incidents of security concern (IOSC). Overall, the IOSC program was effectively managed and increasingly engaged in an attempt to drive down operational errors and oversights occurring across the laboratories. Progress was realized in reducing minor and moderate incidents of security concern despite increases in classified workload.

Performance Objective 6: Leadership

Summary

The performance of Sandia National Laboratories leadership (10% of at-risk fee) was rated as Satisfactory. This rating is based on the positive work of Sandia leadership in the majority of the performance objective, but largely degraded by the results of the Department of Justice (DOJ) investigation and settlement based on allegations of improper use of government funds for lobbying activities. The allegations and subsequent settlement damaged the reputation of the Laboratory and the parent company. The new Laboratory Director and other senior managers demonstrated a commitment to improve transparency and partnership. Their actions acknowledging and implementing appropriate corrective measures were positive, but did not overcome the negative results of the DOJ investigation and settlement during this rating period. This performance objective would have received a higher adjectival rating except for the results of the DOJ investigation.

In FY 2015, Laboratory leadership demonstrated improved performance in the following areas: increased transparency across a number of programs; improvement of the conduct of laboratory self-assessments; and, the enhancement of Sandia assurance systems. Sandia continued sustained high performance in the areas of contributions to the DOE/NNSA enterprise and community engagement. Improvements continued in enhancing overall safety culture with the ongoing implementation of the Site-Wide Strategy for Safety Improvement Plan and the transition to Explosive Safety Centers of Excellence. The execution of the plan to create the centers of excellence presented challenges that slowed programmatic deliverables as noted in Performance Objective 1.

CF-6.1: Sandia exceeded expectations in their collaboration with other laboratories to develop key sections of the NNSA Strategic Vision. This vital role demonstrated enterprise leadership in producing a product that effectively communicates the NNSA vision to external stakeholders. Sandia also updated the Laboratory's FY 2016 through FY 2020 Strategic Plan. This document contained new strategic objectives that reflected and clearly articulated the synergistic relationship between the nuclear weapons missions and broader national security missions.

CF-6.2: Sandia met expectations in the following areas: promoting a culture of critical self-assessment and transparency; instilling a culture of accountability, responsibility, safety and performance through the entire organization; and coordinating/communicating key issues and concerns to NNSA leadership.

Sandia completed 34 internal audits in numerous topical areas. Two noteworthy assessments were focused on the safety of pressurized systems and the conduct of operations. The correction of issues identified in these assessments will contribute to the improvement of safe laboratory operations.

Sandia demonstrated a much improved culture of transparency in several areas, to include Strategic Partnership Programs, Nuclear Weapons Programs and interactions with the Board of Directors. Improvements were made to the Laboratory Assurance Information System (AIS) to increase functionality, ease the search and retrieval of information, and allow enhanced access for the NNSA Sandia Field Office to performance assurance information.

Sandia leadership maintained a steady focus on quality. Sandia Quality Assurance Systems were more effective as the Laboratory closed findings from the March 2012 NNSA Compliance Based Assessment (CBA).

Sandia worked with NNSA to resolve concerns with the NEPA process for biosecurity work. The Laboratory committed to providing resources to complete a programmatic environmental assessment, resolving a longstanding challenge related to the field office approval of biosecurity work.

As noted in Performance Objective 5, Sandia was proactive in forming a plan to address the safety of explosive operations through forming three Explosive Centers of Excellence. The implementation of this plan during the reporting period created the delay of program deliverables as noted in performance objective 1. The implementation strategy for the centers of excellence and subsequent process changes were initially slow and not well communicated through all levels of the organization. Subsequent senior management attention began to rectify the situation by the end of this performance period.

CF-6.3: Sandia met performance expectations in the areas of addressing the institutional use of its management assurance system and leveraging parent company expertise.

Sandia maintained International Standardization Organization (ISO) registrations for its corporate management and environmental management systems, with both areas receiving positive audit results. Sandia completed validations for correcting issues from two excellent reviews relating to its quality assurance and environment, safety, and health programs. In addition, Sandia engaged in multiple continuous improvement efforts addressing quality assurance and project management. Sandia took steps to evaluate the effectiveness of its assurance system, but at the end of FY 2015, had not established a process or indicators that demonstrate measurable improvements.

Sandia leveraged Lockheed Martin Corporation's buying power for travel and procurement activities and saved approximately $5 million annually. The Laboratory successfully received support from its parent company for the implementation of an Earned Value Management System (EVMS) for the B61-12 program.

CF-6.4: Sandia exceeded expectations in working within the DOE complex to develop, integrate, and implement enterprise solutions that maximized program outputs at best value to the government. Examples of high quality work to improve the enterprise included: collaboration with the Kansas City Plant to resolve an issue that impacted W76-1 Life Extension Program production; jointly working with LANL, LLNL and NNSA to reshape National Boost Initiative plans; extensive coordination among the many stakeholders involved with the B61-12 LEP; providing enhanced diagnostics work to support the national plan to achieve Critical Decision 1 for the U1a project; and gaining tri-lab support for a consistent NNSA policy for off-site assessments.

The Laboratory provided 20 personnel to assist with the Waste Isolation Pilot Plant radiation release analysis. These experts contributed to a team that designed a process to receive, screen, analyze and report air filter samples from WIPP. The team's contributions ensured a factual and defensible DOE report regarding the WIPP incident.

CF-6.5: Sandia did not meet the expectations of NNSA in the area of professional excellence and continuous improvement.

A DOJ investigation substantiated the allegations that Sandia violated the False Claims Act and provisions of the contract by using appropriated funds to implement a strategy to influence federal officials to extend the Sandia contract without competition. Sandia fell short of meeting the high standards for business integrity required of FFRDCs and damaged the reputation of Sandia National Laboratories and its parent company.

SSO-6.1: Sandia continued the commitment to improve safety through the use of the Site Wide Strategy for Safety Improvement (SWSSI) Plan. Sandia demonstrated numerous safety improvements as a result of executing the plan. A notable practice was the establishment of an external Work Planning and Control Advisory Board to evaluate the deployment and application of engineered safety. Individual divisions made progress on the milestones in their SWSSI plans, with some divisions using an independent review to monitor the progress of the plan's implementation. Corporately, Sandia lacked a coherent mechanism to track and articulate the effects of the site-wide improvements resulting from SWSSI implementation.