National Nuclear Security Administration

National Security Technologies, LLC (NSTec)

Fiscal Year 2014 Performance Evaluation Report (PER)

NNSA Nevada Field Office (NFO)

Performance Period:
October 2013 – September 2014

November 14, 2014

Executive Summary

This Performance Evaluation Report (PER) provides the assessment of National Security Technologies, LLC (NSTec) performance for the period of October 1, 2013 through September 30, 2014, as evaluated against the objectives defined in the Fiscal Year (FY) 2014 Strategic Performance Evaluation Plan (PEP). The National Nuclear Security Administration (NNSA) took into consideration and consolidated all input provided (e.g CAS, Program Reviews, etc.) from NNSA Program and Functional Offices both at Headquarters and in the field. The five Performance Objectives (POs) in the PEP were graded using adjectival ratings as described in the Federal Acquisition Regulation (FAR) against the Contributing Factors and Site Specific Outcomes identified in the PEP.

NSTec submitted a Performance Self-Assessment Report that covered the rating period. NSTec is to be commended for the thoroughness of their report which embraced the expectation of being self-critical, as well as highlighting accomplishments. FY 2014 was a very good year for NSTec, highlighted by significant contributions to the enterprise by effectively performing across all of their mission lines including Stockpile Stewardship, Nuclear Non-proliferation, and Environmental Management.

While the balance of NSTec's performance during the fiscal year was very good, there were several challenges during this period that did not reflect the operational excellence expected from an M&O contractor. Most notable were the A-1 Machine Shop dimensional inspection issue, the explosion of an isopropyl alcohol drum stored at the Nonproliferation Test and Evaluation Complex (NPTEC) facility, and an electrical near miss event. The dimensional inspection issue had a demonstrable impact to the Stockpile mission and was a key driver in the PO-1 and PO-5 elements being rated at very good even though the mission accomplishments and enterprise engagements were significant. At the NPTEC facility, an isopropyl alcohol drum that had exceeded its shelf life exploded when handled by workers resulting in worker injuries and putting the facility in a stand-down condition for an extended period which affected several Nevada National Security Site (NNSS) customers. The incident wherein an employee cut through an energized cable during a project activity was a near miss that could have resulted in a serious injury or death. While these are not all of the operational issues experienced during the fiscal year, these represent the most serious ones experienced at the site. As a result of the various incidents experienced during the year, NNSA normally identified several systemic issues that contributed to the operational concerns putting NSTec on notice that these issues must be corrected in a verifiable and sustainable manner. NSTec responded with focused management attention, outstanding parent corporation support, and major operational changes that indicate a heightened level of commitment and focus that had been lacking in how the company, as a whole, had responded to similar challenges in the past. The response provided was above and beyond what was anticipated and is clearly driving towards enhanced safety culture that is focused on efficient and predictable mission outcomes.

PO-1: Manage the Nuclear Weapons Mission (25% of At-risk fee) was rated as VERY GOOD. NSTec demonstrated successful management of the programs and projects in support of Stockpile Stewardship by meeting all of its National Level 2 milestones. NSTec's key accomplishment for Stockpile Stewardship was the execution of the Leda subcritical experiment with 100 percent data return, unprecedented in its relevance for validating existing national laboratory weapons

certification models. LEDA also returned more data in the one experiment than all previous subcritical experiments combined.

PO-2: Broader National Security Mission (12.5% of At-risk fee) was rated as VERY GOOD. In the area of Non-proliferation, NSTec significantly contributed to the strategic framework for arms control, transparency, and verification as evidenced by the End-to-End Demonstration, the Underground Nuclear Event Signatures Experiment, and hosting both the U.S. – Russia Joint Verification Experiments 25th Anniversary and the P3 meetings held in early FY 2014, at a time when there was a lot of competing priorities to address both the planning for and resumption of activities impacted by the NNSA efforts to address the Government Shutdown driven by Sequestration. These key events leveraged nuclear security enterprise resources to support arms control initiatives and provide a foundation for cooperative research with international partners. In the area of Emergency Response, NSTec supported 13 real world events and 54 training exercises both in the U.S. and internationally. This included the President's State of the Union address and the Boston Marathon, as well as the World Ice Hockey Championship and the Federation Internationale de Football Association (FIFA) World Cup.

PO-3: Science, Technology & Engineering (ST&E) and Other DOE Mission Objectives (12.5% of At-risk fee) were rated as EXCELLENT. NSTec demonstrated outstanding contributions to national security missions by advancing the state-of-the-art in dynamic experiment diagnostics leading to unprecedented optical images and securing a patent for Multipoint Photonic Doppler Velocimety. This is just one example of the outstanding work NSTec is doing in support of the enterprise. Across many research and development lines, NSTec is successfully partnering with academia, the National Laboratories, and various other entities to address emerging technological challenges that have made significant and visible contributions to our national security posture. Under Environmental Management, NSTec enabled the disposal of 1.3 million cubic feet of low level waste supporting both numerous DOE and NNSA customers. Of significance is the fact 561,805 hours of work was required to support this activity and there were no lost-time accidents during this period. NSTec also worked with DoD to establish a Classified Components Disposal process that is a significant cost savings for the customer. In addition to maintaining operational excellence for waste disposal activities, NSTec was able to accomplish this work during a time of significant political scrutiny from both the State of Nevada and the Nevada delegation due to planned Consolidated Edison Uranium Solidification Program (CEUSP) disposal actions for which they had no control or say in the process. Keeping employees focused on safe operations during periods of high stress is commendable. NSTec also met all of its environmental restoration activities ahead of schedule and under cost, which in itself, is a notable achievement given the current regulatory relationship being experienced with the State.

PO-4: Operations & Infrastructure (25% of At-risk fee) was rated as GOOD. While PO-4 was the weakest element in terms of overall performance, there were still several noteworthy accomplishments during the fiscal year. Noteworthy accomplishments include NSTec's excess property campaign which generated over $1.2M in revenue reducing environmental liability for the Agency and offsetting common use operating costs to the benefit of all NNSS users. Despite having challenges in some of their small business specific goals, NSTec significantly exceeded the overall small business goal by almost 20 percent, awarding 73 percent of its subcontract dollars to small businesses. NSTec received notable recognition through their receipt of the DOE Sustainability Award for Fleet maintenance and a Federal Energy and Water Management Award. NSTec received a rating of "Good" (highest rating possible) for all metrics established by the Office of Field Financial

Management with notable achievements that included the effective management of operations during the significant disruptions created as a result of Sequestration and the potential shutdown activities early in the year. Cost avoidance/ savings were achieved through the redesigning and implementing of cost share strategies for employee Health and Welfare programs as well as the continued identification and implementation of efficiencies through "back office" consolidation efforts. NSTec-led consolidation efforts included the development and implementation of a joint Incidents of Security Program Plan for the Nevada Enterprise and the transition to the OneEOC concept which has proven to be very successful. Further, NSTec matured several of their key operational programs and continued to provide effective and efficient operations in environmental protection, radiation protection, aviation safety, criticality safety, and explosive safety in support of multiple mission activities and competing priorities, which in itself is a notable achievement.

PO-5: Leadership (25% of At-risk fee) was rated as VERY GOOD. During the year, NSTec provided excellent support to several multi-site and multi-organizational collaboration efforts throughout the year including high profile activities such as the 25th Anniversary of the Joint Verification Experiments and the P-3 collaboration, designed to help support arms control, transparency, and verification initiatives. NSTec successfully worked through upset conditions and funding uncertainties, completing all FY14 level 1 and 2 milestones associated with Stockpile Stewardship and Global Security. NSTec's creation of the Strategic Framework Implementer established Strategic Enabling Goals (SEGs) for the company that will be implemented over the next 25 years. Through a partnership with the Air Force, NSTec devised a methodology to dispose of Air Force classified components that resulted in a cost savings to the Air Force. NSTec issued appropriate and timely communications to the NNSA Enterprise providing lessons learned and other operational safety information to the complex related to a variety of technical issues. NSTec created an undergraduate scholarship program with the University of Nevada, Las Vegas (UNLV) to develop students at all degree levels able to transition directly into the NNSA workforce. In order to support NSTec's goal to be a learning organization, it continued implementation of leadership development activities utilizing Learning as Leadership's We-Lead program reaching down and across all levels of management within its organization. As discussed earlier, NSTec experienced a variety of operational issues (discussed in PO-4) that occurred in FY14. Many of these events can be attributed to issues with management engagement and integration issues that are a continual challenge in balancing a diverse and complicated operational portfolio. In response to these concerns, the NSTec Parent Organizations provided enhanced support above and beyond that required by the contract, funding a large group of high-level experts in important disciplines to come on-site to assist NSTec management in the development and implementation of a comprehensive corrective action plan that focuses on correcting the systemic issues underlying the operational upsets experienced during the FY. This support is a direct conduit to knowledge and best practices from the parent organizations that have not been made available, with this level of commitment, in the past providing critical reach back to expertise in work planning, work control, and quality necessary to correct the identified deficiencies.

Performance Objective 1: Manage the Nuclear Weapons Mission

Summary

VERY GOOD

Overall, NSTec performed above expectations in their ability to manage the Nuclear Weapons Mission. NSTec effectively collaborated with National Laboratories, other Government agencies, and universities to foster R&D and accomplish the NNSA mission. By meeting all of its National level 2 milestones, NSTec demonstrated successful management of the programs and projects in support of Stockpile Stewardship. In particular, the Leda experiment was completed with 100% data return, demonstrated new diagnostic technology developments, and completed a fifth generation Multiplexed Photonic Doppler Velocimetry (MPDV) system implementation. Despite two upset conditions involving quality assurance issues that caused some program rework, NSTec worked aggressively and effectively applied its resources and skills to recover and made significant contributions to the Nuclear Weapons Enterprise primarily for unprecedented data recovery and facility/critical skills support. NSTec effectively contributed to the diagnostic successes of several Stockpile Stewardship physics drivers across the complex, and NSTec played a key critical role in developing a sustainable enterprise vision for Advanced Radiography. This later resulted in an NNSA CD-0 approval for Enhanced Capabilities for Subcritical Experiments. NNSA agrees with most of the NSTec Self-Assessment, but cannot agree with the rating of Excellent due to the quality assurance upset conditions which were NSTec's responsibility to manage and execute. The upset conditions resulted in increased costs from rework as well as schedule delays. The NNSA rating is **VERY GOOD**.

NSTec successfully completed its 19 FY 2014 NA-10 National Level 2 milestones and associated deliverables all of which directly supported the FY 2014 Stockpile Stewardship Science Program Implementation Plan. In doing so, NSTec had to re-align the work breakdown structure (WBS) to enable more efficient support of subcritical requirements including new projects aligned toward future experimental technologies and experiments. NSTec met expectations of the Enterprise Modeling Consortium (EMC) through thorough analysis and support for the W78/88-1 assessment of alternatives for EMC activities.

NSTec effectively managed the operation of key nuclear facilities with focus on safe and secure operations. NSTec effectively adjusted and reprioritized resources to recover from operational upsets caused by Quality Assurance issues from a supplier as well as Quality Assurance issues from inadequate dimensional inspections. NSTec also effectively and successfully minimized impacts from a catastrophic failure of a Device Assembly Facility (DAF) fire suppression system lead-in line failure. The lead-in line failure impacted the DAF operations for only a week.

In response to the NNSA reduced funding and budget restructuring (control level) decisions, NSTec proactively initiated several strategies to effectively deal with the issues created. NSTec proactively developed an innovative strategy to consolidate maintenance activities and gain efficiencies to deal with the NNSA budget shortfalls in maintenance that begin in FY15. In addition, NSTec significantly modified their planning and execution framework without delaying field execution and support to mission activities. NSTec implemented an accelerated budget reduction within Program Readiness (PR) from the expected $21M to $17M level by communicating impacts with Laboratories and NNSA to adjust FY 2016–FY 2020 programming efforts affected by the NNSA directed change. NSTec

effectively supported coordination and integration of complex-wide initiatives from NA-00 on the G2, as well as Program exchanges with Science Campaign, Directed Stockpile Work (DSW), and Readiness in Technical Base and Facilities (RTBF) programs.

NSTec successfully partnered with Lawrence Livermore National Laboratory (LLNL), DOE/Environmental Management (EM), and Idaho National Laboratories (INL) to develop a solution for removal of special material items from the site, including the successful completion of a Readiness Assessment and Pre-start closure. In addition, NSTec gained efficiencies by evaluating the need for a Joint Actinide Shock Physics Experimental Research (JASPER) annual Documented Safety Analysis (DSA) Update and justifying that an update was not needed.

NSTec successfully supported the safe and secure execution of Leda scaled integral hydro experiment with 100% data capture. Leda results directly contribute to the National Security Laboratories' ability to predictively model and assess weapon performance in the absence of underground testing. In addition, for Leda, NSTec developed, implemented and optimized a new Zoom Lens System (ZLS) in U1a to improve radiographic imaging by a factor of 3X. NSTec also developed and implemented a new diagnostic system (Dynamic Surface Imaging, a stretch goal) and set a new record on the number of optical points recorded at ~160. NSTec developed and implemented qualification programs for both NSTec and Laboratory personnel that will ensure personnel involved in SCEs maintain a level of proficiency required by the improved readiness process. NSTec experienced several operational pauses this fiscal year for quality issues including calibration deficiencies at a machine shop that machined parts critical to the Leda experiment as well as a quality issue with a vendor that supplied required parts for the experiment. In addition, NSTec also experienced a pause in operations related to high explosives while procedures were reviewed and rewritten. These issues impacted the schedule of Leda. NNSA did appreciate NSTec being proactive in dealing with these issues and in keeping both NNSA and their laboratory partners informed. However, these issues prevent an "Excellent" evaluation.

NSTec continued successful re-analysis of underground test (UGT) data to add to the validation suite for weapon modeling that contributes to assessment and to better understand boost physics, a near-term Predictive Capability Pegpost. Algorithm development continued, with 10 additional event films scanned. The same Nuclear Event Analysis project completed analysis of 12 NUES, THREX, or PINEX Optical Flux Monitor data sets, completed film scanning of 40 Reaction History Events for Los Alamos National Laboratory (LANL), installed and learned to use physics software, COMSOL, to emulate the performance of the empirically based models.

NSTec supported the successful execution of ten JASPER experiments to enhance gun performance and reliability, validate gun control and flyer plate planarity at low velocities, and add premier plutonium equation of state data. Four shots were Pu Alpha Hugoniot experiments, including one Actinide Equation of State measurement.

NSTec completed the construction of the JASPER Gun Room Diagnostic Rack that will enable next-generation, more sophisticated diagnostics; provided NNSS site, facility, and operations support to the Nuclear Criticality Safety Program (NCSP) National Criticality Experiments Research Center (NCERC); and ensured experiments were successfully completed as planned.

NSTec significantly exceeded expectations in initiating the dialog on advanced radiography by developing the white paper, "A Proposal for an Advanced Radiographic Facility in the U1a Complex—Using a Demonstrated Technology from a Commercially Available Source," during December, and socialized the contents with HQ managers and Laboratory POCs during various discussions. The proposal was to establish a new advanced radiography capability at the NNSS.

Overall, NSTec performed above expectations in executing deliveries for the stockpile work to meet limited-life component exchanges (LLCE) and dismantlements. Working in concert with Los Alamos National Laboratory (LANL), NSTec successfully demilitarized the components from the Device Assessment Project, completing a Level 2 milestone below cost and within a tight schedule.

The A-1 Machine Shop operated by NSTec fabricated, inspected, and delivered numerous (classified) parts that support the B61 Program, training components for the Weapon Surety Program for LANL, and piece parts for the W88 Program. The classified capability was developed to enhance support and relieve stressed operations in the NNSA Stockpile Management Program.

NSTec diagnostic development activities are revolutionizing the quality, kind, and quantity of data being gathered to support the Stockpile Stewardship program. NSTec's next generation multipoint fisheye optical probe and Multiplexed Photonic Doppler Velocimetry (MPDV) systems were deployed in new facilities throughout the experimental complex. The data being generated is touted by the NNSA experimental community as unprecedented in quality and quantity and is changing experimental techniques that have been used for 70 years and is already affecting this year's annual assessment certification by the National Security Laboratory Directors to Congress.

NSTec reconfigured the streak imaging and the gated imaging systems used on the Radiographic Integrated Test Stand (RITS) to collect optical plasma data, which enhances the quality and repeatability of the data. NSTec also developed a novel "leapfrog" PDV diagnostic for characterizing cylindrical implosion experiments on SNL's Z platform. Its spectacular early performance has led to development of a six-channel system. This experiment platform is providing unique applications for ICF and dynamic materials characterization.

NSTec executed the Deuterium-Tritium Dense Plasma Focus (DT-DPF) experiments for the first time with DT entering a new phase of operations at the NNSS. Analysis shows promising neutron production for future experiments and established the DPF as a key element of the recently-created Neutron Diagnosed Subcritical Experiments (NDSE).

NSTec contributed to the advancement of diagnostic technologies used at JASPER. This included development of a new light source with a goal of achieving a color temperature of over 3000K (demonstrated 3400K), the development of new shorting pins (specification established with LLNL), as well as advancements in measuring the electrical conductivity of metals under dynamic load.

NSTec continues successfully working with academia establishing partnerships and providing internship programs focused on strategic, inter- disciplinary Science, Technology, Engineering, and Mathematics (STEM) development supporting NNSS mission. NSTec sponsored a collaborative endeavor at the UNLV, submitting its first Opto-Electronic Application Specific Integrated Circuit (ASIC) for fabrication. They also completed the Mini-X Ray Diodes (Mini-XRD) experiment series at the

University of Nevada, Reno, Terawatt Facility on the Zebra x-pinch X-ray source. Performing an experiment and taking data at an experimental facility was a stretch goal.

In radiography, NSTec investigated texture analysis for boundary extraction in Gemini data; Developed Cygnus data pipeline to LANL and supporting analysis for daily shot report; Dewarped image data from Zoom Lens System (ZLS); established dewarping impacts on noise; Developed iterative approach for the Quick-Look destarring; Updated ImageTool and Image Reduction Analysis (IRA) blurring and deblur capabilities. NSTec was also able to eliminate archaic Interactive Data Language features that impacted performance.

In Holography, NSTec developed preliminary analysis to process double pulse data to extract velocities; developed new rule based approach to analysis; shifted the focus of interferometry/velocimetry away from data analysis and more to enhancing and streamlining analysis codes for future SCEs. Analysis codes include QuickView, iPDV, QuickBatch, and QuickPlotter.

NSTec effectively developed and implemented strategies to support introduction of new missions into the DAF. They proactively managed work prioritization and execution with LLNL and NNSA to establish three new projects/capabilities in DAF: Full Scale Compatibility Project, Computed Tomography, and Pit Coring. These capabilities support existing and new missions/challenges within the stockpile.

Overall, NSTec exceeded expectations in their work on advanced radiography, as well as completing 10 JASPER shots, and demonstrating pyrometry at the High Explosives Application Facility (HEAF). NSTec, along with LANL, LLNL, and Sandia National Laboratories (SNL), demonstrated extraordinary cooperation in providing and integrating needed proposals, analyses, and operational information needed to make a national decision on advanced radiography at U1a.

NSTec has been a significant contributor of the comprehensive Five-Year Planning Basis (FY 2015–FY 2019) for follow-on SCE planning, which was negotiated with NNSA Program and Lab Science Executives as the NNSS program of record. NSTec developed/integrated the multi-year plan for the framework, the suites of platforms, and diagnostics to provide increasingly sophisticated Pu materials properties data from focused, integral, and scaled experiments.

NSTec continued improving the U1a DSA to supports the Advanced Fielding of Dynamic Experiments (AFDE) project. This revision incorporated the expanded U1a infrastructure for the U1a.05a drift extension and applied a graded approach to control selection by placing emphasis on passive engineered controls. The revised safety basis and infrastructure enables 3′ and 6″ vessels for future experiments.

NSTec successfully managed and operated the key nuclear NNSS facilities supporting multiple programs in a responsive, proactive manner with minimal interruptions to programmatic execution. To proactively address more effective implementation of complex operational activities inherent in the DAF and U1a, NSTec clearly demonstrated integration to aggressively expanded strategies that reach beyond base operations management functions in accelerating and enhancing Integrated Planning and Execution (IP&E) activities. NSTec effectively responded to the DAF lead-in line failure and initiated proactive actions to restore operations and elevate the priority of lead-in line repairs. NSTec prioritized activities and dedicated operating funds in support of recovery and leak investigation

actions while strengthening detection capabilities and initiation of safety basis changes that will enable a more effective and rapid response to potential future leaks. NSTec established the Nuclear and High Hazard Construction (NH2C) group supporting construction/modification activities in nuclear and high hazard facilities at the NNSS. Based on the success at DAF, NH2C was effectively leveraged at U1a to reduce the fire loading consistent with the U1a long-term Fire Protection Strategy (FPS). NH2C identified, tagged, and removed over 91,000 feet of inactive legacy cable. DAF incorporated many DSA changes to improve efficiency of operations and accommodate important NNSA programs such as: Full Scale Compatibility, Computed Tomography, and Pit Coring.

NSTec contributed a chapter for the FY 2015 Stockpile Stewardship and Management Plan (SSMP) on the current approach for sustaining UGT readiness via elements in a robust experiment program and work environment compliant with formality of operations. NSTec coordinated a Labs Diagnostic Workshop to discuss and prioritize current and future years Material Diagnostics Experimental needs, an area where NSTec can spearhead. NSTec analyzed diagnostic needs along the lines of platform, physics to be explored, relative priority, need date, and technology readiness level. As an illustration of NSTec's leadership role, an updated Integrated Program for Experimental Diagnostics summarizing the overall needs and pursuits of the Science and ICF Campaign diagnostics was documented as part of a national deliverable and distributed to the diagnostic community.

Performance Objective 2: Broader National Security Mission

Summary

Very Good

Overall, NSTec's performance supporting PO-2 exceeded expectations. For National Emergency Response related activities, NSTec significantly exceeded performance expectations. NSTec supported 13 real world and 54 training exercises. NSTec provided radiological detection equipment and support for the World Ice Hockey Championship and the 2014 Fédération Internationale de Football Association (FIFA) World Cup. These deployments significantly contributed to the overall safety of these international events. Also, NSTec significantly contributed to the safety and security of multiple U.S. high profile events including the President's State of the Union address and the Boston Marathon. In aviation, NSTec received the Federal Aviation Administration's Aviation Maintenance Technician Diamond Award for Excellence for the ninth consecutive year. For Nuclear Nonproliferation related activities, NSTec met performance expectations. NSTec exceeded performance expectations in the End to End and Global Threat Reduction Initiatives (GTRI) campaigns and met performance expectation in the Underground Nuclear Event Signatures Experiment Forensics (UNESE); however, NSTec performed below expectation in technical and management support of the Source Physics Experiment (SPE). Considering both National Emergency Response and Nuclear Nonproliferation support, the NNSA rating for NSTec is **VERY GOOD**. NNSA is in agreement with the NSTec Self-Assessment.

NSTec's effective management of the Global Threat Reduction Initiative (GTRI) Remove Program led to the successful execution of the Basic Ordering Agreement (BOA) in Armenia and Revision 11 General Ordering Agreement (GOA) in Russia. Prior to FY2014, the Russian work was delayed for over a year due to protocol issues within the Multilateral Nuclear Environmental Program. However, execution of Revision 11 of the GOA initiated the restart of all work in Russia moving it forward.

Under the GTRI Protect Program in Belarus, NSTec exceeded expectations by successfully completing the installation of physical protection enhancements ahead of schedule at all 10 of the buildings planned for FY 2014 as well as six additional buildings. The completion of the upgrades at 16 buildings brings the metric to a 160% completion rate. NSTec also completed two sustainability assessments allowing for subcontracts to be issued for radiological material transportation infrastructure in Russia. In addition, NSTec completed sustainability upgrades as well.

NSTec continued unsatisfactory performance in resolving technical and management issues in support of SPE experiment execution, representing one-third of the non-proliferation budget. Good performance in the End-to-End (E2E) campaign was a notable exception. UNESE and Forensics met expectations. NSTec must demonstrate a sustained degree of commitment to this contributing factor to improve execution of complex field experiments.

NSTec initiated planning for the SPE Phase II experiments which is a long-term NNSA R&D effort aimed at improving arms control and nonproliferation verification and monitoring. This included official NNSA concurrence to use U2ez test readiness borehole for SPE Phase II, saving the program over $5M. NSTec completed preliminary activities for the UNESE, focused on detecting and identifying enduring signatures of potential underground nuclear events for treaty verification and

test monitoring purposes. NSTec drilled multiple holes to support gas sampling and model development; developed and characterized a test bed (U20az), including obtaining core samples to determine the geological strata. In support of Chain of Custody and E2E projects NSTec successfully completed the last Test Evaluation at Baker Site and X Tunnel, and closed out the Chain of Custody phase; began the E2E project as the next phase of the Warhead Monitoring program; and established a Lead Integration Team for the E2E project including lab members. NSTec successfully performed the first phase of testing for the High Explosives Testing Program, including experiments at *Big Explosives Experimental Facility* (BEEF). NSTec partnered with the National Labs to successfully complete 35 separate shots within three weeks with a focus of developing a predictive modeling capability that increases confidence in answering nonproliferation questions.

NSTec significantly exceeded expectations in their support for National Emergency Response.

- Emergency Management: On August 4, 2014, the NSTec Emergency Operations Center (EOC) Emergency Manager (EM) declared an Operational Emergency Not Requiring Classification (OENRC) due to severe weather (flooding). The EOC Monitoring Team was activated and efficiently handled this incident that was further complicated due to deteriorating road conditions and road closures offsite which limited safe routes for employees departing the NNSS. Additionally, NSTec conducted a Full Scale Exercise (Springbok-14) involving employee recognition/identification of a malevolent act-type event perpetrated by a simulated domestic terrorist element that has infiltrated the U1a Complex. All exercise objectives were met.
- Emergency Response: RAP 7 Team 3 met or exceeded all program expectations of NNSA's NER Radiological Assistance Program (RAP), including maintaining equipment, personnel training, and readiness. The team participated in the following exercises and activities: quarterly training; the Advanced Equipment Seminar; RAPTER (players and controllers); the RAD Round-Up event in Kauai, HI.
- Consequence Management Response Team (CMRT) Federal Radiological Monitoring and Assessment Center (FRMAC) & Aerial Monitoring System (AMS): Remote Sensing Laboratory (RSL) has met or exceeded most of the cost, schedule, and technical requirement expectations. RSL met expectations regarding their NA-42 Program support, including maintaining equipment, personnel training and readiness, and support of the Vibrant Response Exercise. AMS conducted numerous aerial surveys including, but not limited to, JB Andrews, New York (West Valley Demonstration Project), Washington D.C. (the African Leadership Summit, the Las Vegas Strip (New Year's Eve activities).Operations & Exercises: Nuclear Rad Assist Team (NRAT)/RAP 0 provided scientific expertise and Emergency Response (ER) personnel during the conduct of Preventative Radiological/Nuclear Detection (PRND) operations for the 4th of July activities on the Mall in Washington D.C. RAP 0 was the lead planner and executor of PRND operations for the African Leadership Summit, completed the Pedestrian Mapping of the Washington Nationals Stadium in preparation for the Major League Baseball (MLB) Playoffs. Technology Integration: RSL completed 100% of its deliverables for FY 2014, with 96% completed on time.
- NRAT (East and West): RSL provided excellent, exceeding expectations, support to exercises and training with interagency partners, in particular the Federal Bureau of Investigations (FBI) and the Vibrant Response exercise. NRAT continues to provide excellent scientific support in preparing for and during national special security events (NSSEs) and exercises and continues to focus on the scientific aspects of the NA-42 mission which are so important to NA-42's success.

- Nuclear Forensics (Pre-Detonation): NSTec enhanced the operational effectiveness of NA-45 program operations at P-Tunnel by installing a concrete invert, improved lighting, and a separate area constructed solely for the purpose of conducting radiography operations. These improvements significantly contributed to the multiagency exercise conducted at the tunnel in third quarter FY 2014 providing an expanded work area, improved safety of operations given the concrete invert versus dirt and gravel, and improvements in transition of exercise components between the work spaces underground.
- NA-40, Emergency Communication Network: NSTec exceeded program requirements. Of specific note were the actions taken to assist in cost reduction through enhanced presentation of data, efforts made at streamlining the procurement process, and close scrutiny of overhead costs.
- The International Emergency Management and Cooperation Programs at RSL demonstrated outstanding performance with respect to the NA-46 mission. They exceeded expectations in executing their Program Execution Plan as noted in their performance for the International Radiological Assistance Program Training for Emergency Response (IRAPTER), International Consequence Management (ICM), Geographic Information System (GIS), Global Initiative to Combat Nuclear Terrorism (GICNT) and other outreach/training programs and for support provided to our international agreements. NSTec support was exceptional; this is noted in their support for maintaining and improving training programs, equipment maintenance, willingness to support short notice taskings, specialized training and mission support activities for major public events (World Ice Hockey Championship, World Cup, Super Bowl, etc.), and for reach-back assistance. Additionally, NSTec provided exceptional support with respect to the NV Network and GIS programs with their icloud networking initiatives and support provided to GICNT.

NSTec conducted training, provided radiological detection equipment, and conducted in-country support for the World Ice Hockey Championships and the 2014 FIFA World Cup. For the World Ice Hockey Championships, the host country invitation was received less than 30 days prior to the event requiring NSTec to make all final travel and equipment shipping arrangements – a very short time period for such an event. The World Cup was extraordinary as the games were held in 12 different venues throughout Brazil requiring deployment and set up of equipment over a very large area. Also, Brazil has a high crime rate which led to implementation of enhanced security measures for the deployed teams to minimize the safety risk for the deployment. Ultimately however, these NSTec deployments significantly contributed to the overall safety of these high profile international events. NSTec successfully met readiness requirements for all response assets per NA-40 guidance during FY 2014 through creative and effective management of extremely limited funds. NSTec's Nuclear/Radiological Advisory Teams developed the inaugural enhanced training for FBI Special Weapons and Tactics (SWAT) teams and then conducted this enhanced throughout the year for multiple SWAT teams. NSTec led this interagency effort that resulted in establishing DOE's presence as recognized expertise in the area of Radiological/Nuclear search operations during an interagency search response. For the ninth consecutive year, the NSTec Aviation Maintenance program received the Federal Aviation Administration's Aviation Maintenance Technician Diamond Award for Excellence reflecting on outstanding performance of the Aviation Maintenance Technicians. In an effort to provide enhanced training to various RAP regions, NSTec initiated, planned and conducted a Consequence Management (CM) drill in Knoxville, TN, that integrated the RAP Regions 2 & 3 with the CMRT to increase RAP readiness for participation in potential CM events. NSTec successfully led or

participated in several training drills and exercises including Operation Resilient Glow, Marble Challenge, Watts Bar Ingestion Pathway, Urban Shield, CHAOS, TRACER, WINGS, TREMOR-14, NUWAIX 14, Vibrant Response 14, Tempest Wind and others. In the area of Crisis Response, NSTec conducted the preventative radiological/nuclear detection planning, deployed search equipment and personnel for multiple U.S. High Profile events including the 2014 Presidential State of the Union Address, the U.S. ALS, the Boston Marathon, and the Las Vegas New Year's Eve celebration. The NSTec support for these events significantly contributed to the overall safety and security of these events.

NSTec expanded the scientific expertise and capabilities in the realm of nuclear forensics science by conducting experimental tests at the NNSS. Experimental tests included an irradiation at NCERC and field collections of materials sent to the national laboratories for analysis.

NSTec provided technical integration of research, development, test, and evaluation for the NNSA in collaboration with LANL, LLNL, SNL, Pacific Northwest Laboratories (PNNL), and others as requested through National Center for Nuclear Security (NCNS). During FY 2014, the NCNS Treaty Verification and Test Monitoring R&D, Warhead Monitoring R&D, and Nonproliferation R&D programs and their projects contributed to completing NNSA missions and expanding NSTec's role in national security.

Performance Objective 3: Science, Technology, and Engineering and Other DOE Mission Objectives

Summary

Excellent

Overall, NSTec's performance significantly exceeded expectations demonstrating outstanding contribution to the NNSA national security missions and DOE Environmental Management (EM) Program. NSTec continues with the execution of a very successful Site Directed Research & Development (SDRD) program. NSTec excels in the technology maturation of dynamic experiment diagnostics. The advances in science and engineering and the partnerships with the National Laboratories and universities promoted through the SDRD program directly contribute to the goals of the NNSA. These efforts, among several transformative imaging and electronic measurement improvements from this performance objective area, resulted in a Dynamic Imaging System of the imploding inner shell of the Leda experiment that provided never before seen optical images. NSTec's support to the DOE EM Program, both the Environmental Restoration and Waste Management, was also excellent. NSTec performed receipt and disposal of 1.269M Ft3 of low-level waste (LLW) for the DOE Complex. This is fifteen percent more than planned, even during a time when the relationship with our state regulators has been more adversarial because of the Consolidated Edison Uranium Solidification Program (CEUSP) waste stream. NNSA evaluated the NSTec self-assessment and in both cases concurs with the NSTec rating of **EXCELLENT**.

On July 23-24, 2014, NNSA conducted a programmatic review of SDRD and found that NSTec significantly exceeded expectations by implementing a research strategy that is clear and aligns SDRD projects with the overall research strategy of the site and supports DOE/NNSA priorities. For example, NSTec published the NNSS Technology Needs Assessment as an R&D guide for SDRD activities. This document contains data on stockpile stewardship, global security, nonproliferation, and national nuclear security needs. In addition, NSTec published a strategic framework implementer outlining near-term goals for technology development and maturation and is developing a technology roadmap that aligns with the implementer. The new implementer, the roadmap and the existing Technology Needs Assessment (TNA) for R&D will provide a direct tie to strategic Science and Technology national security goals. NSTec's SDRD program is serving as a pipeline; moving technologies developed in the SDRD program to NNSA programs for further development, refinement, and implementation into NNSA and Other Government Agency (OGA) systems. SDRD presented Stockpile Stewardship relevant work being performed in the High Energy Density Physics (HEDP) Diagnostics Project at the 20th Topical Conference on High-Temperature Plasma Diagnostics that is now being pursued by the National Labs.

NSTec significantly exceeded expectations by utilizing an External Advisory Board, with 8 members from top lab & industry positions, to critique SDRD investments and provide advice on scientific and technical quality and impact; mission relevance; adequacy of peer review process and pushing the envelope in discovery and exploratory projects that benefit the DOE/NNSA and the nation. The major areas of focus identified for projects included: Core-punch radiography in Pu and Neutron Diagnosed Subcritical Experiments (U1a); High Resolution, low areal mass x-ray radiography with Pu (Cygnus); development of extending imaging technology; and exploitation of experimental data through continually advancing analysis techniques. Specific accomplishments in the SDRD program include the development of an innovative high-performance InGaAs detector which has much wider utility for

stockpile program pyrometry diagnostics. LANL expressed an interest in incorporating this in the TA-55 system as soon as possible.

NSTec significantly exceeded expectations by demonstrating leading edge research through new publications in peer reviewed journals including *Review of Scientific Instruments* which explain unprecedented angular accuracy for radiation detection, and could become the standard algorithm for all such detection systems. Another manuscript on dynamic temperature measurements (follow-up to a previous *Journal of Applied Physics* article) describes new laser preheating techniques to measure bulk temperatures in shock compressed matter. In addition, NSTec continues efforts in advancing frontiers through new SDRD projects, such as "Ionospheric plasma coupling to low-frequency Electro Magnetic radiation," which seeks innovative approaches to underground nuclear event detection and monitoring and "Dynamic recompression of damaged materials," which focuses on unknown processes in extreme materials in an effort to understand problems with strength and damage models. NSTec also provided transformative and innovative contributions to the diagnostic engineering arena including: a direct optical diagnostic capturing real-time motion of inner shell structures in scaled imploding weapon systems—new and never previously fielded on a dynamic materials experiment; a sophisticated ZLS for use in SCE radiographic imaging that significantly improved the image quality of flash radiographs of imploding systems; a "leapfrog" PDV diagnostic for characterizing cylindrical implosion experiments on SNL's Z platform; a target preheat capability successfully implemented to support high pressure materials characterization experiments on the A platform.

As a direct result of an SDRD project, NSTec received U.S. Patent #8,711,336 for Multipoint Photonic Doppler Velocimetry using Optical Lens Elements, U.S. Patent Application S/N 13/666.953NSTec continues to maintain a healthy research environment by providing funding and planning resources to the principal investigators to accomplish R&D objectives. NSTec, in partnership with UNLV, co-hosted a PDV workshop to share this technology and to promote information exchange. More than 125 attendees participated from the NSE, NASA, Atomic Weapons Establishment (AWE), Commissariat a L'Energie Atomique (CEA), and academia, along with nine vendors of equipment. NSTec effectively manages proposals for feasibility studies and encourages staff to submit ideas including time-sensitive small proposals with high potential payoff. This flexibility and that of the SDRD program affords some of the best opportunity to jump start time critical solutions and enhances overall employee satisfaction and boosts productivity. NSTec created a new CTO internal website which successfully acts as the communication hub for the technical workforce encompassing four US States and eight individual locations. This includes a new technology blog. a new technology capability database (NSTechipedia) to enhance the NSTec workforce's ability to respond to proposal calls and other new mission initiatives. In addition, NSTec also established a Memorandum of Understanding (MOU) with the University of California Santa Barbara to formalize advance research collaboration and provide an avenue to attract new talent from the University of California system.

NSTec's research and technology transfer programs exceed expectations by being deployed across the complex, university systems, and industry: Examples include:

- Ionospheric modeling which may enable early detection of earthquakes based on sensitive signal to noise extraction;
- Elpasolites scintillators now deployed in new configurations as a dual gamma-neutron directional detectors that improved energy resolution over NaI detectors, with good neutron/gamma discrimination and potential for low cost production; and when combined

with NSTec's covariance techniques these detectors could provide the highest level of performance known to exist; and

- In collaboration with UNLV, a new form of radioactive Technetium matrixed with a fluorescent dye is being developed as a surrogate material for realistic training exercises to provide the responder community with a chemically inert, environmentally friendly material which can be replenished to ensure uniform training experience.
- NSTec facilitated the transfer of Three Million Megavolt (TriMev), a 3 Mega-Electron Volts (MeV) flash radiography source, and its technology to Idaho State University for their accelerator program. This now provides Idaho State with a new test platform for radiographic and pulsed power studies and provides NSTec with needed space to begin the study of new pulsed power architectures such as the linear transformer driver.
- NSTec established the process to develop Cooperative Research and Development Agreements (CRADAs) with outside groups and has started work on the first NSTec CRADA with industry.
- NSTec successfully worked with the Defense Threat Reduction Agency (DTRA) and NA-40 to identify private vendors to receive NSTec-developed technology for Jolt and 6-Band to enable additional vendor capability to manufacture items for government use.

NSTec installed an enhanced camera on SNL's Radiographic Integrated Test Stand (RITS) machine and explored diode operation with strong collimation. The resultant quality of both the imaging system and the radiograph exceed expectations and represent a vast improvement in capability over any previous results. This improvement drove pulsed driven flash radiography into new applications at SNL and the complex. In addition, NSTec supported the National Labs in analyzing radiographic test objects to achieve consensus on radiographic requirements for future (next 5 years) applications. This quarter, dose, spot size, spectral, and imaging data were successfully supplied to LANL and LLNL for forward modeling of the diode performance in support of their respective radiographic requirements. NSTec also continues to play a lead role in coordinating technology development supporting core-punch radiographic capabilities.

NSTec is effectively using the allocated SDRD budget to successfully partner with academia, National Laboratories, and other external entities to develop strategic documents aligned with the NNSA and national missions needs to establish relevant R&D activities for meeting technological challenges.

NSTec significantly exceeded expectations by executing transformative R&D in the velocimetry arena including: successful deployment of the Gen 2 MPDV System as demonstrated on the H4286 Hydrotest at on both axes at the Dual Axis Radiographic Hydro Test Facility (DARHT), completion of an optical transfer system design for Leda surface imaging, and development of next-gen (GEN X) MPDV Laser Module with a full laser command set implemented to allow the lasers to be controlled using text commands over Universal Serial Bus (USB) via a microcontroller giving the laser modulation circuitry a better step-response. The MPDV has become the most important diagnostic tools in shock physics experimentation, including in the nation's subcritical nuclear experimentation program. It continues to make outstanding contributions for NNSA.

NSTec's Environmental Management program performed in an excellent manner throughout FY14. Of note, this positive performance has occurred during a time of significant regulatory political scrutiny of waste activities from both the state of Nevada and the Nevada Delegation due to CEUSP. Large volumes of waste were received over the last six months of the performance period resulting

in a significant effort to safely off-load and dispose. Overall, NSTec safely and securely disposed of over 1.3 million feet of waste consisting of approximately 1,400 truckloads; In addition, NSTec Environmental Management activities have successfully worked 561,805 hours in Low-Level- Waste (LLW) Operations without a lost time accident; Environmental Restoration (ER) work was completed ahead of schedule and under cost; and NSTec coordination on multi-site projects (e.g., special items, Performance Demonstration Program (PDP), Classified Components Disposal (CCD), CEUSP) and completion of activities under their control on these projects significantly exceeded expectations.

NSTec significantly exceeded expectations for maintaining the Radioactive Waste Management Complex (RWMC) and performing receipt and disposal operations in support of the DOE complex. LLW operations received 1.269M ft^3 of waste, 15% more than the projection of 1.1M ft^3. The NSTec Radioactive Waste Acceptance Program (RWAP) team completed 27 RWAP facility evaluations for the fiscal year. In addition, the Transuranic (TRU) Pad Cover Building was completed this year and is a great improvement in Area 5.

NSTec exceeded expectations for coordination and support of waste packaging and disposal operations for CCD by exceeding the plan volume. In addition, they continued to educate potential customers on the availability and efficiency of the CCD capability at the NNSS. The outreach by NSTec is one of the main reasons the planned volume was exceeded.

As part of CEUSP support, NSTec supported the NSSA during significant stakeholder interactions in November 2013. This included developing many iterations of quick response questions and answers based on incoming questions from the state of Nevada and Nevada state and Congressional politicians. Further, NSTec supported a significant increase in waste management-related public tours. Finally, NSTec supported many DOE Working Group related actions including waste profile and transportation analyses on CEUSP and other waste form and disposal packaging technologies. Collectively, these waste management actions were often completed with significantly constrained response times—often in hours.

Performance Objective 4: Operations and Infrastructure

Summary

GOOD

Overall, NSTec's performance for effectively and efficiently managing site operations while maintaining an NNSA enterprise-wide focus, and demonstrated accountability for mission performance under their purview is rated as **GOOD**. NSTec exceeded expectations by demonstrating outstanding initiatives in utilizing down time at the Device Assembly Facility (DAF) NSTec successfully coordinated and supported multiple high profile multinational events such as JvE, P3, and WINS at the NNSS. The High Mast Lighting and Legacy Projects were successfully completed ahead of schedule. NSTec received the DOE Sustainability Award for Fleet Maintenance and a Federal Energy and Water Management Award. NSTec continued to deliver efficient and effective business operations and systems as well as legal management. NSTec's Excess Property Management campaign performed notably by generating over $1.2M in revenue and the Procurement organization significantly exceeded the overall Small Business (SB) Goal for FY14 by almost 20% (72.66% vs goal of 54.00%). NSTec met expectations in delivering effective, efficient and responsive physical, information, and cyber management and processes as well as Environmental Protection, Radiation Protection, Aviation Safety, Criticality Safety, and Explosives Safety programs in support of multiple mission activities. However, NSTec did not meet expectations in worker safety & health and conduct of operations program. During the year, performance deteriorated where a number of incidences occurred which included in a significant event that lead to serious employee injuries that identified issues with the effective implementation of these programs. As a result of these incidences, NSTec and its Parent Organization Oversight Committee (POOC) have placed significant, highly visible, management attention on correcting long-standing systemic issues that contributed to these events. In addition, NSTec is still struggling with configuration management and safety basis documentation rework. NNSA evaluated the NSTec self-assessment and does not concur with the NSTec rating of Very Good. Specific observations follow:

NSTec continued to improve their performance of maintenance by demonstrating outstanding initiatives in utilizing down time at the DAF to refurbish the cooling tower and to install a new orifice plate at the same time that NSTec was identifying the location and isolating the water leak at DAF. NSTec provided project status updates for NFO's operational awareness allowing for improved communication for maintenance personnel and oversight and has successfully completed Maintenance and Repair projects in a timely manner surpassing the historical norm this year.

NSTec did an outstanding job coordinating with NFO and other contractor participants to develop and submit the S18C DSA Addendum/TRU Technical Safety Requirement (TSR) Change Notice (CN) 11 to meet an extremely accelerated schedule. The DSA/TSR was approved without any issues.

NSTec successfully coordinated and supported multiple high profile multinational events such as JvE, P3, and WINS at the NNSS.

NSTec did an excellent job of leading an integrated team of NFO contractors to develop joint Incidents of Security Concern Program Plan for the Nevada enterprise.

NSTec cyber security successfully completed a 100% password change for all users and applications. This significant effort required modifications to the codes of some applications to facilitate the password change.

The NSTec's vehicle fleet was ranked 36th (of 38,000) by the 100 Best Fleets in North America and received the DOE Sustainability Award for Fleet Maintenance.

NSTec received a Federal Energy and Water Management Award for the Nevada National Security Site (NNSS) Alternative Fuel Availability at Facility Fueling Stations and the Alternative Vehicle Management Program.

NSTec successfully demonstrated the effectiveness of the new OneEOC to engage Nevada Enterprise (NvE) management to reduce or mitigate hazard situations that had either caused or had the potential to cause serious health and safety impacts to workers.

NSTec converted Design Engineering to a service center at the beginning of FY 2014 to reduce the costs for Design Engineering services to customers. Along with reorganization of staff, the transition is allowing Design Engineering to be competitive with commercial Engineering services, to be better equipped to remain within budget, and to provide cost savings to projects and facilities that utilize Engineering services.

NSTec met or exceeded most of the expectations for energy management goals. Energy intensity and potable water reduction targets are tracking well ahead of the interim targets to achieve the 2020 goal. All mandated energy and water evaluations have been completed for the year and NSTec is on track to meet most metering targets. However, High Performance Sustainable Building compliance and greenhouse gas reduction are below expectations. NSTec significantly reduced historical energy usage at Livermore Operations by implementing several infrastructure improvements. In addition, NSTec supported NFO's development of a new Energy Savings Performance Contract (ESPC) by compiling an extensive amount of information to respond to the subcontractor's Requests for Information and supported facility walk-throughs for project developers.

Overall, for Infrastructure and Capital Planning, NSTec is assessed as meeting expectations.

NSTec met most and exceeded some expectations in delivering efficient and effective business operations and systems. NSTec exceeded expectations in the area of Property Management. NSTec received an "Outstanding" rating on the FY 2014 Annual Property Assessment. In addition, NSTec was acknowledged for managing their internal and external excess property activities for which they received an Area of Excellence. NSTec's Excess Property Management campaign met its FY14 stretch goal by generating over $1.2M in revenue. For the third year in a row, the revenue generated under this campaign reduced the environmental liability, cleaned up areas on the NNSS, and generated revenue to defer operating costs.

NSTec received a rating of "Good" (highest rating available) on all Office of Field Financial Management performance measures. During the first quarter of the year, NSTec diligently worked through the disruptions associated with the lapse of appropriations, Continuing Resolution, a potential sequestration and the planning required for a shutdown of the site. In Contractor Human Resources, NSTec continued to look for ways to achieve cost savings/cost avoidance in their

employee benefits program. In FY14, NSTec was able to achieve cost savings/cost avoidance by implementing plan design changes and employee premium cost share strategies to their Health and Welfare program. Back Office Consolidation activities continued to drive efficiencies and the Comprehensive Workforce Management Project and the Enterprise Content Management Initiative (iCon) are proceeding on schedule.

NSTec significantly exceeded the overall FY14 SB goal of 54.00% by awarding 72.66% of its actual subcontract dollars to SBs. NSTec exceeded their goals for three of the five total SB subcategories, achieving over twice the Goal that had been established for the Small-Disadvantaged Business (SDB) subcategory . However, NSTec fell just short of meeting its FY14 goals for HUB Zone and Veteran-Owned SB (VOSB) due in part to the unavailability of sources in the HUB Zone and VOSB subcategories as well as unforeseen budget reductions and constraints. NSTec achieved significant improvements in the number of eSourcing events (20%), a growth in spend (61%), savings in commodity spend (12.2%), and an improvement in eStores transactions (24%) over FY 2013. It is worth noting, at 51%, NNSS has the highest utilization rate of the eSourcing tool which yielded $1.7M of strategic tool enabled savings to date. NNSS also reported strategic site savings of $2.7M (2.2% Strategic Savings rate & 2% of overall program total) against a total invoice spend of $123M.

NSTec's Legal Organization exceeded expectations. NSTec provided cost effective legal management with use of in-house counsel and alternative dispute resolution where appropriate, and diligent oversight of outside counsel legal strategies and costs, in compliance with the timely submitted and approved NSTec Legal Management Plan required by the revised 10 CFR 719. NSTec Legal also accepted ownership of the Business Conduct and Ethics Program, delivering ethics updates to employees. They also provided proactive mentoring to the NSTec Employee Relations Dept. to improve the conduct of investigations and the understanding of relevant laws.

NSTec was able to successfully reprioritize funding within a constrained budget in order to replace some of the failing or near failing infrastructure at DAF and purchase materials.

NSTec successfully completed the High Mast Lighting and Legacy Projects ahead of schedule. However, although NSTec completed installation of the DAF access road barriers in 2013, components of the access road barriers are not fully functional and continue to have problems requiring troubleshooting and replacement of drive motors, wiring, and sensors. As a result, the DAF access road barriers have not been placed into operations.

NSTec met expectations in delivering effective, efficient and responsive physical, information, and cyber management and processes. NSTec continues to implement effective and efficient MC&A, Personnel, Information (Classified Matter Protection and Control and Classification), and cyber security programs.

NSTec continued to provide effective and efficient Environmental Protection, Radiation Protection, Aviation Safety, Criticality Safety, and Explosives Safety programs in support of multiple mission activities. The field implementation of NFO approved safety basis documents by NSTec remains sound and NSTec has made progress in improving USQ documents.

NSTec continued to manage the Occurrence Reporting Process and input to the HQ database in a timely manner throughout the fiscal year. Response timeframes and follow-up to corrective actions have been acceptable.

NSTec held an Infrastructure Portfolio Management and Directorate Workshop for NFO that discussed Risk Management Strategies. Development of an Integrated Infrastructure Risk Management Plan, Integrated Infrastructure Risk List and Risk Register were completed prior to the Workshop which allowed for open communication on strategies for project planning and engineering.

NSTec successfully demonstrated the OneEOC operational capabilities during the Nonproliferation Test and Evaluation Complex (NPTEC) occupational accident and NNSS Flash flooding incidents by employing applicable safety systems and processes to mitigate the hazardous situations. NSTec Fire & Rescue responded to 151 incidents related to wildland fires, fire alarms, vehicle accidents, hazardous material responses, and emergency medical service calls. These incident calls also include off-site responses relating to transferring patients and vehicle accidents via mutual aid agreements with local community partners. NSTec facilitated two successfully conducted national Continuity of Operations (COOP) table top exercises jointly sponsored by external agencies displaying NFO's readiness to respond to a pandemic scenario and COOP events. NSTec effectively coordinated external Full Participation Exercises involving 45 offsite agencies which resulted in positive feedback from HQ, agency heads, and local emergency management responders for its creativeness and execution.

The Comprehensive Workforce Management Project (CWMP) and iCon continued their progress against aggressive schedules in FY14. The CWMP developed career ladders, salary structures, and job descriptions for all job families and has mapped non-bargaining employees to the new structures. Under a successful iCon pilot project, the NSTec Ethics form went live on schedule at the end of May and the Unreviewed Safety Question (USQ) and Defense Experimentation and Stockpile Stewardship (DESS) workflow projects went live at the end of September. All records schedules were also in iCon prior to the end of the year.

After extensive coordination, NSTec obtained approval to ship over 1,000 boxes of records to DOE's Office of Science & Technical Information (OSTI) for their storage and management. Twenty additional boxes of documents were sent to the Nuclear Testing Archives to support the Energy Employees Occupational Illness Compensation Program Act (EEOICPA) program. These actions will reduce the future facility and staff resources required to manage this volume of records.

While NSTec made significant progress in improving their Incidents of Security Concern (IOSC) Program, prioritization of incident closures, closure timeliness, and quality of inquiry reports continued as issues during the year. NSTec reported 11 incidents in FY 14. Of the seven inquiry reports submitted, only one could be closed upon receipt the others were returned at least one time for significant corrections and resubmission. NSTec metrics associated with these areas clearly indicate a trend towards meeting expectations in the near future.

Although NSTec has been operating under an International Standards Organization (ISO) 9001 certified Quality Management Program, a Voluntary Protection Program Superior Star safety program, and an approved 10 CFR 851 Worker Safety and Health program for several years, a number of incidences occurred during the year which were directly related to the recurrence of systemic problem as a result of the lack of integration and planning, lack of transparency, lack of accountability,

ineffective resolution of issues, and ineffective operations. These incidences identified issues with the effective implementation of NSTec's worker safety & health and conduct of operations programs. Some of these incidences include: the laser alignment incident at JASPER, the Ursa Minor incident at Sandia National Laboratory, the A-1Machine Shop dimensional inspection issues, the cutting of the electrical cable in Area 25, the exploding drum at NPTEC, and a maintenance worker entering the BEEF access point without authorization. NSTec and its POOC placed significant, highly visible, management attention on correcting long-standing systemic issues that contributed to these events.

Safety basis documents are still requiring rework. The DAF Authorization Agreement was rejected by NFO. Even after multiple attempts over a several year period, the NSTec submittal of the DAF DSA CN 1 and 2 resulted in four Conditions of approval and the NCERC DSA CN 4 resulted in two conditions of approval. In addition, the NSTec Contractor Readiness Assessment of the S18C Transfer failed to identify several issues that were caught by the federal Readiness Assessment team. Changes to their Quality Assurance, Mission Assurance, and Nuclear Operations organizations have been implemented to correct identified issues.

Prior to FY 2014, NSTec developed and implemented a site wide configuration management program at all of the NNSS nuclear facilities. As part of this implementation, NSTec conducted an analysis on each of the DAF safety systems to identify gaps between the as is condition and the requirements of the configuration management program and made considerable progress in correcting the gaps. However, NSTec did not make any further progress in closing the DAF configuration management gaps during FY 2014. NSTec has not conducted the gap analysis at two of the other nuclear facilities as of the end of FY 2014. As a result, NSTec is unable to ensure that the actual condition of the safety systems at these facilities meet the requirements of the program. In FY 2013, NSTec established a Cognizant System Engineering program that was adequately staffed to provide complete coverage of all safety systems and support multiple projects. However, in FY 2014, NSTec was not able to maintain complete coverage of all systems in accordance with DOE O 420.1 expectations.

Performance issues were identified in the areas of Performance and Quality Assurance. This included a lower than expected self-identification performance ratio; continued disagreements over priority level of issues; and, failure to develop and implement Corrective Action Plans in a timely fashion. However, after several self-revealing or self-identified events in the 3rd quarter, NSTec and its POOC responded well to NFO demands for significant and rapid performance improvement. In the last half of FY 2014 NSTec, increased executive management engagement and leadership to address these challenges.

NSTec did not receive authorization to perform work on the DAF Argus project this fiscal year, as funding to support the FY14 Budget Request was not provided and is still uncertain.

Performance Objective 5: Leadership

Summary

VERY GOOD

Overall, NSTec's performance in demonstrating leadership in supporting the direction of the overall DOE/NNSA mission and being responsive to issues and opportunities for continuous improvement internally and across the Enterprise is rated **VERY GOOD**. During the year, NSTec provided excellent support to several multi-site collaboration efforts throughout the year. They successfully worked through upsets throughout the year and funding uncertainties with the budget and managed to complete all of its FY14 milestones associated with Stockpile Stewardship and Global Security. NSTec's creation of the Strategic Framework Implementer establishes Strategic Enabling Goals (SEGs) for the company that will be implemented over the next 25 years. Through a partnership with the Air Force, NSTec devised a methodology to dispose of Air Force classified components that resulted in a cost savings to the Air Force. NSTec issued appropriate and timely communications to the NNSA Enterprise providing lessons learned and other operational safety information to the complex related to a variety of technical issues. NSTec created an undergraduate scholarship program with the UNLV to develop students at all degree levels who can transition directly into the NNSA workforce. In order to support NSTec's goal to be a learning organization, they continued implementation of the Learning as Leadership We-Lead program in FY14 and identified FY 2015 program dates. In response to a variety of issues that occurred in FY14, the NSTec POOC provided enhanced support beyond that required by the contract by funding a large group of high-level experts in important disciplines from the parent organizations to come on-site to assist NSTec in the development of a comprehensive corrective action plan. These individuals provided knowledge and contact to the best practices in the parent organizations. The enhanced POOC support provided critical reach back to expertise in work planning, work control and quality that made direct input into improving the corrective actions and providing a better system. NNSA evaluated the NSTec self-assessment and does concur with the NSTec rating of VERY GOOD. Specific observations follow:

NSTec leadership effectively supported the execution of NNSA mission and projects. Throughout FY14, management attention and leadership principles were applied to adjust to operational upsets as realized. NSTec successfully worked through upsets associated with QA, chemical storage, lasers, lock out/tag out (LO/TO), and funding uncertainties with the budget and managed to complete all of its FY14 milestones associated with Stockpile Stewardship and Global Security.

NSTec provided excellent support to several multi-site collaboration efforts including:

- Collaborative execution of Leda
- Work with the Kansas City Plant (KCP), SNL, and the Department of Defense (DOD) as a member of the B61 Program Integration Working Group
- Collaborative, efficient diagnostic development across the weapons laboratories in support of project such as Z, National Ignition Facility (NIF), Los Alamos Neutron Science Center (LANSCE), DAHRTS and RITS

NSTec successfully coordinated and supported multiple high profile multinational events such as JvE, P3, and WINS at the NNSS during FY 2014

As a result of NSTec's leadership, vision, and entrepreneurial approach, they were able to partner with the Air Force to devise a methodology to dispose of Air Force (Hill AFB) classified components. This resulted in a cost savings to the Air Force of $3.4M.

NSTec issued appropriate and timely communications to the NNSA Enterprise providing lessons learned and other operational safety information to the complex related to:

- the removal of the vendor from the NNSA Master Approved Supplier List (MASL) while the investigation on the QG-1/2 material continues;
- beryllium in the door springs of screen room doors creating a Faraday Cage; and
- the failure of a handle on a commonly used, complex-wide transportation package for high explosives

NSTec's creation of the Strategic Framework Implementer establishes SEGs for the company that will be implemented over the next 25 years. The emphasis this document provides, especially for the next 3-year period, will dramatically enhance planning and execution for the overall company.

NSTec leadership was fundamental in establishing several Integration Boards (i.e. for Safety Basis, Fire Protection, Execution Working Group) chartered to operate nuclear facilities effectively while increasing the operational tempo and customer base. These Leadership boards are driving effective operational decision making in a declining budget environment.

NSTec completed all scheduled management assessments. Assessments have been reviewed and approved by cognizant managers and kept under configuration management through a Joint Assessment Schedule that is accessible by NSTec and NFO staff for review

NSTec created an undergraduate scholarship program with the University of Nevada Las Vegas (UNLV) to develop students at all degree levels who can transition directly into the NNSA workforce. The overall vision is a collaboration between NSTec and UNLV to promote research and development in areas of importance for our national security mission and develop interdisciplinary programs and internship opportunities that will build relationships between students and NSTec, with the goal that these students will graduate and become part of our technical workforce.

NSTec was instrumental in developing the Screening Information Request for the State of Nevada. The State of Nevada was one of six public entities selected by the Federal Aviation Administration (FAA) that will develop unmanned aircraft systems (UAS) research and test sites around the country.

In order to support NSTec's goal to be a learning organization, they continued implementation of the Learning as Leadership We-Lead program and identified FY 2015 program dates. NSTec also initiated processes to implement the Spark Your Mastery learning opportunity for NSTec and NNSA/NFO. This series of classes, designed for first-line supervisors and staff, aligns with "Learning as Leadership's 4 Mastery and We-Lead Programs" and will support culture change efforts to improve communication, trust, collaboration, and problem-solving at all levels of the organization.

Enhanced POOC Support: A number of incidences occurred in Q3 and Q4 of FY14 which were directly related to the recurrence of systemic problem as a result of the lack of integration and planning, lack

of transparency, lack of accountability, ineffective resolution of issues, and ineffective operations. These incidences identified issues with the effective implementation of NSTec's worker safety & health and conduct of operations programs. In addition, NSTec's attempted implementation of an Integrated Management Improvement Plan (IMIP) that outlined numerous self-identified weaknesses to improve overall performance did not progress as planned. NSTec realized late in FY14 that many of the IMIP actions could not be achieved and they developed a new path forward. During this time, NSTec's leadership was sometimes reluctant to collaborate and communicate with the NFO. In response to the various issues, the NSTec POOC provided enhanced support beyond that required by the contract by funding a large group of high-level experts in important disciplines from the parent organizations to come on-site to assist NSTec in the development of an effective corrective action plan. These individuals provided knowledge and contact to the best practices in the parent organizations. The enhanced POOC support provided critical reach back to expertise in work planning, work control and quality that made direct input into improving the corrective actions and providing a better system. Some of the POOC expertise was in the area of root cause analysis which ensured that the important causes were being addressed by the identified corrective actions. The POOC team also provided critical red-teaming of the total corrective action plan to ensure that the plan was streamlined to increase the likelihood of success. The original POOC contingent stayed on site for a period of 60 days. Several of these individuals have been embedded into the NSTec organization and will provide support for an extended period with the intent of ensuring the needed corrective actions are effectively implemented.