National Nuclear Security Administration

Savannah River Nuclear Solutions

Fiscal Year 2014 Performance Evaluation Report (PER)

NNSA Savannah River Field Office

Performance Period:
October 2013 – September 2014

November 14, 2014

Executive Summary

This Performance Evaluation Report (PER) provides the assessment of Savannah River Nuclear Solutions, LLC (SRNS) 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 basic Performance Objectives (POs) in the PEP were graded using adjectival ratings as described in the Federal Acquisition Regulation (FAR). Comments on the performance of each Contributing Factor (CF) and Site Specific Outcomes (SSO) under each PO identified in the PEP are provided as well.

SRNS submitted a Performance Self-Assessment Report that covered the rating period. The SRNS report highlighted accomplishments, but was somewhat weak on discussing shortcomings. The NNSA did not agree with the SRNS adjectival self-ratings for four of the five POs, but was within one category of the SRNS ratings.

The work performed for Tritium and the Office of Fissile Materials Disposition at the Savannah River Site is conducted by Savannah River Nuclear Solutions, LLC (SRNS) under Management and Operating Contract #DE-AC09-08SR22470. This is a Department of Energy (DOE) Office of Environmental Management (EM) contract under which NNSA-funded and directed work is performed.

The Savannah River Field Office (SRFO) feedback process utilizes the *Actuate BIRT* software package to track and document contractor performance, as well as the SRFO evaluation of that performance, on a continuous basis. Monthly feedback meetings were held with SRNS throughout the performance period where SRNS was apprised of performance traits, both favorable and unfavorable, in each evaluated area. Where performance was rated as not meeting expectations, SRNS was informed of the deficiencies and the impacts to the program. Corrective actions were then planned, executed and discussed at the next monthly performance meeting, and during routine senior leadership engagements. Monthly reports were transmitted to SRNS as well as NNSA-HQ program offices.

For FY14, each NNSA site contractor is operating under a Strategic CPEP with 100% of "at-risk" fee being subjective. The Strategic CPEP consists of five (5) Performance Objectives (POs) which are standard across the Nuclear Security Enterprise (NSE), and supplemented with Site Specific Outcomes (SSOs). Fee is distributed among the five (5) POs as specified in the CPEP.

PO - 1: Manage the Nuclear Weapons Mission (25% of At-risk fee) was rated as **Excellent**.

Overall, SRNS's performance for PO-1 exceeded expectations. SRNS met or exceeded the Program Implementation Plan work scope (Level 2 milestones) funded through Directed Stockpile Work (DSW), Campaigns, and Readiness in Technical Base and Facilities (RTBF). SRNS performed this work scope by delivering to the cost, schedule, weapons quality and operational requirements, as well as by technical performance, without impact to safety or security despite challenges presented by the lapse in government funding in October 2013, the extreme winter challenges from the shutdown of the site, and the loss of steam and freeze damage to facilities resulting from severe cold weather and snow events in 2QFY14.

SRNS performed significantly above expectations by accomplishing negotiated work with program sponsors and achieving the expected level of quality to ensure safe, secure, reliable weapon performance and transportation. They provided cost-effective operations and performed significantly above expectation in developing a strong technical and risk basis analysis supporting a concept to reduce programmatic and mission risk from an aging infrastructure. All reservoir shipments (100%) were completed on schedule and to exemplary quality standards, and the number of completed surveillance activities exceeded established goals for FY14.

SRNS performed above expectations in demonstrating the application of new strategies, technologies, and scientific understanding to support stewardship of the existing stockpile and future stockpile needs while sustaining and strengthening unique science and engineering capabilities, facilities, and essential skills to ensure current and future Nuclear Weapons mission requirements are met.

PO - 2: Broader National Security Mission (12.5% of At-risk fee) was rated as **Good**.

While the overall performance of SRNS was rated **Good**, its support of the Broader National Security Mission was met with both successes and shortcomings.

The top priority for the NNSA Plutonium Disposition program at the Savannah River Site (SRS) was the plutonium oxide production operations in H Area. SRNS was expected to complete HB-Line startup and produce 105 kg of plutonium oxide to the Mixed Oxide Fuel Fabrication Facility (MFFF) feedstock specifications. While these expectations were not fully met, the recent SRNS Leadership changes were effective in demonstrating limited production of plutonium oxide late in FY14.

Savannah River National Laboratory (SRNL) performed above expectations in its support for other nuclear nonproliferation (NN) activities. Most significantly, SRNL provided high level support of the Global Threat Reduction Initiatives (GTRI) projects supporting the 2014 Nuclear Security Summit, which included removal of all Highly Enriched Uranium (HEU) material from Hungary, as well as the removal of plutonium material from Belgium and Italy. SRNS has been a consistently strong performer in support of the GTRI project to remove all HEU and plutonium from Japan's Fast Critical Assembly. SRNL also exceeded expectations in support of the Mo-99 program. The technical quality of their work continues to exceed expectations in its quality and comprehensive depth of analysis.

PO - 3: Science, Technology & Engineering (ST&E) and Other DOE Mission Objectives (12.5% of At-risk fee) was rated as **Very Good**.

SRNS has exceeded the performance expectations in this area by supporting weapons Research and Development (R&D) across the Nuclear Security Enterprise (NSE). The Savannah River Tritium Enterprise (SRTE)(Tritium Programs in conjunction with SRNL) is diligently working in collaboration with other NNSA production sites, laboratories and universities to leverage expertise and resources to meet the mission requirements.

The Technology Management Council (TMC) continued to provide very effective strategic and tactical oversight efforts in promoting the application of beneficial technologies in both the near and long term tritium sustainability requirements. The TMC exceeded expectations by making considerable progress to address real technology issues that are important for tritium production sustainment through development of a Facility Needs & Capabilities Gaps document, guiding formulation of the

FY15 Plant Directed Research and Development (PDRD) projects, as well as providing a baseline for plant technology needs.

SRTE continued to provide timely and effective tritium research and development support to the weapon design agencies (DAs) for Life Extension Program (LEP) Gas Transfer System (GTS) development. The Tritium R&D Steering Committee was very effective in identifying needs and monitoring delivery of SRTE support.

Supporting international cooperation, a SRNL Hydrogen Processing Center Group manager supported Fukishima tritiated water cleanup activities by serving on the Mitsubishi Research Institute review board for cleanup technology selection.

PO - 4: Operations and Infrastructure (25% of At-risk fee) was rated as **Good**.

SRNS met expectations in their ability to meet the DOE/NNSA mission by ensuring Site Operations and Infrastructure were effectively maintained. While there were areas where performance was above expectations, there were also areas that were below expectations.

SRNS continued to meet all tritium mission programs needs during an unusual and challenging year. The first six months of FY14 included a lapse in government funding that resulted in a partial government shutdown, uncertain government budget funding scenarios, two severe weather incidents and an unplanned site steam outage that significantly damaged the facilities and placed the mission at risk. Despite these challenges, SRNS continued to operate safely and effectively.

SRNS continues to maintain a strong record of commitment to industrial safety performance and environmental compliance. Environmental stewardship remains effective with radioactive and other releases well below established limits. SRNS's safety and health performance continued to be very strong.

The Waste Solidification Building (WSB) construction project activities through the year reflect consistent performance against the November 2013 Recovery Plan intended to recover some of the previous schedule slippage. Requests for Equitable Adjustment, from the SRNS construction subcontractor for WSB, represent the most significant risk to meeting the Total Project Cost (TPC). The current Estimate at Completion is within the approved TPC and the project is approximately 98% complete.

Operations and Work Planning throughout the year has been inconsistent and failed to meet expectations. During the first half of FY14, SRTE personnel demonstrated exceptional rigor in operations and overcame several challenges to deliver mission commitments in a safe and disciplined manner. During the second half of FY14, systemic errors and events began to occur as a result of fundamental conduct of operation and work planning and lapses in operational discipline. SRNS management implemented Senior Supervisory Watches and deployed Conduct of Operations Advisors to the field to reinforce conduct of operations expectations and discipline.

PO - 5: Contractor Leadership (25% of At-risk fee) was rated as **Very Good**.

SRNS performance in this area exceeded expectations in their ability to meet NNSA mission by ensuring Leadership is effective in managing safety, security, and programmatic concerns within a fiscally constrained and uncertain environment. Throughout the many external challenges faced during FY14, SRNS leadership remained intently focused on the workforce to ensure operations were conducted in a safe, secure, effective and responsible manner and the operational and workforce distractions were minimalized.

Continuing the trend from prior years, SRNS continues to increase its engagement across the Nuclear Security Enterprise (NSE), with interagency partners, and with the international community to provide leadership that was beneficial to NNSA enterprise priorities and goals.

The SRNS leadership team responded well to the FY13 performance feedback with improved leveraging of both site and corporate reach back resources to address the two most significant FY13 performance failures, the construction progress of the Waste Solidification Building (WSB) and the Alternate Feed Stock-2 (AFS-2) projects.

There were several opportunities where the leadership efforts can be improved to build a more effective and disciplined team. Most notably were improvements that are required in the management oversight and continuous improvement programs that would help detect and prevent the number of conduct of operations issues the tritium program experienced during the fourth quarter. The leadership team must continue to strive towards reducing the low value or overly bureaucratic processes in the programs.

Performance Objective 1: Manage the Nuclear Weapons Mission

Summary

Excellent

Overall, Savannah River Nuclear Solutions (SRNS) performed above expectations in their ability to manage the Nuclear Weapons Mission. SRNS met or exceeded the Program Implementation Plan work scope (Level 2 milestones) funded through Directed Stockpile Work (DSW), Campaigns, and Readiness in Technical Base and Facilities (RTBF). SRNS performed this work scope by delivering to the cost, schedule, weapons quality and operational requirements, as well as by technical performance, without impact to safety or security and despite challenges presented by the lapse in government funding in 1QFY14, the extreme winter challenges causing the shutdown of the site, and the loss of steam and freeze damage to facilities resulting from severe cold weather and snow events in 2QFY14. NNSA reviewed the SRNS Self-Assessment and, in some cases agrees with the overall assessment of Excellent. Specific observations follow:

SRNS performed significantly above expectations by accomplishing negotiated work with program sponsors and achieving the expected level of quality to ensure safe, secure, reliable weapon performance and transportation. SRNS provided cost-effective operations and performed significantly above expectation in developing a strong technical and risk basis analysis supporting a concept to reduce programmatic and mission risk from an aging infrastructure. SRNS was very effective in communicating the risks to stockpile sustainability and initiated a mission needs statement and program requirements document for the Tritium centric operations project and gained NNSA sponsorship for an integrated project development. SRNS completed an important evaluation of the H1616 container which permitted continued container utilization. Additionally, SRNS' utilization of Additive Manufacturing technology to produce mock-ups and guides for training and process fitting resulted in significant efficiency improvements through the avoidance of expensive manufacture cost and the associated time delays of external manufacturing.

SRNS performed above expectations for the cost and technical performance requirements as defined in the program execution document set for Tritium recovery despite of the unanticipated facility freeze damage and resulting reduction of facility capability. In addition, SRNS met the Cycle 11A extraction milestone for Tritium Producing Burnable Absorber Rods (TPBARS) despite constrained Tritium Readiness funding. On a negative note, SRNS failed to deploy the Bulk Tritium Shipping Package (BTSP) at the end of the year as a deliverable milestone. Similarly, SRNS did not meet schedule performance expectations with respect to the 9977 container Safety Analysis Report for Packaging (SARP) (rev.4) mission deliverable.

SRNS met expectations to increase knowledge of the state of the stockpile, resulting from successful execution of the stockpile surveillance program and a robust scientific and engineering understanding supporting delivery of the annual stockpile assessment. SRNS met W76-1, W76-0, W78, W88, B61, B83, and W80 warhead surveillance activities as required by directive documents and supported the Integrated Weapons Evaluation Team meetings and planning requirements. SRNS met the cost, schedule and performance requirements for their component disposition program. Supporting NNSA Enhanced Surveillance initiatives, SRNS completed investigation of ultrasonic testing (UT) methodology for all eight areas of interest on the W76-1 reservoir.

SRNS met expectations to execute deliveries for the stockpile work to meet limited-life component exchanges (LLCE) and dismantlements. Specifically, SRNS provided excellent support in loading and shipping the October and November limited life components (LLCs) ensuring no weapon system goes 'red' due to operational limits imposed by the lapse in government funding at the beginning of FY14. SRNS also provided excellent support in meeting all LLC delivery and surveillance requirements from January through April, even though the processing facilities were severely impacted by the loss of steam to heat the facilities since the safety significant fire suppression system was significantly damaged in one facility and the severe weather led to shutdown of the site for extended periods of time. SRNS met the cost, schedule and performance requirements for their component disposition program. SRNS continues meeting W76-0, W78, W88, B61, B83, and W80 warhead maintenance activities as required by directive documents as well as providing on-time delivery of monthly reports. SRNS met their integrated program deliverable requirements for the W76-1 by ensuring Pantex exceeds program deliverables to the United States Navy. Specifically, SRNS conducted testing and manufacturing activities and shipped MC4380A Neutron Generators (NGs) and 2X Acorn GTS for the W76-1 Mission Needs Schedule (MNS). SRNS, successfully loaded an early prototype unit, as well as worked to identify requirements to make additional reclamations supporting risk mitigation efforts in support of the W87 ALT 360 warhead program.

SRNS performed above expectations to demonstrate the application of new strategies, technologies, and scientific understanding to support stewardship of the existing stockpile and future stockpile needs while sustaining and strengthening unique science and engineering capabilities, facilities, and essential skills to ensure current and future Nuclear Weapons mission requirements are met. In the area of non-nuclear readiness, SRNS characterized processes for welding dissimilar materials in an effort to revolutionize the GTS design, despite limited funding. SRNS collaborated with Sandia National Laboratories (SNL) to conduct small scale testing to warrant the future viability of aluminum as an acceptable material for use in GTS and placed twelve aluminum vessels in the Life Storage Program to support future material assessment in a tritium environment. SRNS made significant progress in tritium processing and GTS development. To provide capability for testing reservoir materials in a high pressure hydrogen environment in FY15, SRNS began modifications to one of their explosion proof lab cells through the development of the Hydrogen Fracture Toughness Tester (HFTT) capability. SRNS's continues to demonstrate an exceptional capacity to sustain and strengthen unique science and engineering capabilities, facilities, and essential skills to ensure current and future Nuclear Weapons mission requirements are met.

SRNS performed above expectations for executing the high priority B61-12 phase 6.3 Life Extension Program (LEP) developmental and programmatic activities. SRNS accomplished this by successfully completing the first war reserve material load of gas transfer components nearly two years ahead of schedule in support of an R&D request from Los Alamos National Laboratory (LANL) to meet an early function test delivery milestone. SRNS provided required input to develop the Pilot Production Program Definition (PPPD), supported ongoing efforts to update NNSA plans and provided on time delivery of components required for qualification tests. SRNS is meeting scheduled deliverables for Subsystem/Component Baseline Design Reviews, PSs (Product Specifications), Technology Readiness Level (TRL) maturation, and Manufacturing Readiness Level (MRL) maturation.

SRNS met expectations in demonstrating the execution of an earned value management system (EVMS) for the B61-12 LEP. SRNS met these expectations by creating a site resource loaded schedule ahead of schedule and providing focused effort towards the NNSA Integrated Master Schedule (NIMS)

baseline. SRNS supported and successfully completed the Integrated Baseline Review (IBR) of their site project controls system, entered and refined risks in the Active Risk Manager (ARM) database and submitted the required monthly reports including status and financial/EVMS data submissions in the requested format to the B61-12 LEP Federal Project Manager (FPM). Moreover, SRNS worked with NNSA to refine site contributions to the Baseline NIMS to improve compliance with the Project Controls System Description and the Project Controls Manual guidance and critical path management.

SRNS met the expectations to demonstrate earned value management systems (EVMS) for the W78/88-1 and W88 ALT 370 programs by completing prioritized activities for the W78/88-1 LEP and efforts on controlled program close-out activities. SRNS provided required technical information to NNSA labs on component design, completed work on all program close-out activities and issued the required site close-out report per NNSA guidance. Monthly reports met expectations and deadlines. SRNS' budget to date conforms to spend plans. SRNS fully met expectations in providing component design and cost information to the labs for the 120-day study.

Performance Objective 2: Broader National Security Mission

Summary

Overall, Savannah River Nuclear Solutions (SRNS) performed at the **Good** level in their ability to meet the Broader National Security Mission. NNSA reviewed the SRNS Self-Assessment and does not agree with the overall assessment of "Very Good". Specific observations follow:

Good

The top priority for the NNSA Plutonium Disposition program at Savannah River was the plutonium oxide production operations in H Area. The FY14 expectations were to complete HB-Line startup and produce 105kg of plutonium oxide to meet Mixed Oxide Fuel Fabrication Facility (MFFF) feedstock specifications. These expectations were not met, however, SRNS is receiving credit for the emphasis by the new SRNS Leadership team in July to ensure production and analysis of one kg of plutonium oxide in FY14. The initial oxide meets MFFF physical, chemical, isotopic, and impurity requirements with the exception of moisture. SRNS is evaluating HB-Line operational and sample collection processes to address the excess moisture in the product.

In Q1, SRNS recognized that the HB-Line startup schedule would be furthered delayed due to the time needed to address corrective actions from the DOE Readiness Assessment (RA) suspended the previous year (August 2013). The revised schedule should have supported production of 35kg of spec plutonium oxide in FY14. Although this campaign and program scope is executed in a DOE Environmental Management (EM) facility, SRNS managed the resources and actions to address an H-Canyon Ventilation Potential for Inadequacy in Safety Analysis (PISA) concern, requiring significant site resources and integration, which avoided even further delays to the HB-Line AFS-2 startup. In addition to the startup delay and not meeting the production goal, SRNS extended the AFS-2 campaign three more years due to changes in assumptions for ramping up H-Area out-year production capabilities, significantly increasing projected lifecycle costs. These new assumptions reflect more realistic availability of resources to perform the operations. SRNS demonstrated clear improvement after the third quarter at multiple leadership levels to focus on long term AFS-2 mission objectives. The results can be seen as SRNS focuses on optimizing initial product quality, future production targets, and successful integration with EM missions in H-Canyon.

SRNS, including Savannah River National Laboratory (SRNL), performed above expectations in its support for the other nuclear nonproliferation (NN) activities. Most significantly, SRNL provided support and oversight of removal of all Highly Enriched Uranium (HEU) from Hungary which capped an eight-year, $40M project that supported the 2014 Nuclear Security Summit objective. Hungary awarded the Golden Cross of Merit of the Republic of Hungary (their highest civilian award) to an SRNL researcher for his efforts to reduce the threat of terrorism by eliminating HEU from Hungary.

SRNL exceeded expectations in support of the Mo-99 program. The technical quality of SRNS' work continues to exceed expectations in its quality and comprehensive depth of analysis. SRNL completed fabrication and testing of the demonstration Thermal Cycling Absorption Process (TCAP) hydrogen isotope separation system and delivered the *SHINE Tritium Purification System (TPS) Design Report*, meeting a key project milestone.

SRNS support for the efforts to safeguard and secure sensitive nuclear materials, technologies and facilities was above expectations. SRNL completed the annual monitoring of SRS' shut-down reactors by a Russian delegation under the Plutonium Production Reactor Agreement (PPRA) with no concerns identified.

SRNL completed a significant number of NNSA license reviews, Nuclear Interdiction Action Group (NIAG) reviews, and Shield reviews which provided timely information for use by other federal agencies – State and Commerce departments and the U.S. Intelligence Community. Shield reviews are the analog to NIAG reviews for chem/bio components. All of these reviews were of a high quality and provided significant information to the intelligence and export control communities.

SRNL exceeded the expectation in providing Radiological Assistance Program (RAP) team's expertise to train Federal Bureau of Investigation (FBI) bomb technicians', support of multiple exercises for the FBI and Department of State (DOS), and supported the FBI's forensic examinations of radiologically contaminated evidence.

SRNS has consistently performed at a high level in support of Global Threat Reduction Initiatives (GTRI) projects to remove plutonium from Belgium and Italy. The successful completion of these projects was recognized as key deliverables at the 2014 Nuclear Security Summit. SRNS also did an excellent job supporting the mock deployment exercise in FY14 under GTRI's Emerging Threats Program. SRNS has consistently performed at a high level in support of the GTRI project to remove all HEU and plutonium from Japan's Fast Critical Assembly.

In support of the Export Control Review and Compliance (ECRC)/Interdiction programs, SRNL completed excellent export control technical reviews in support of Department of Commerce (DOC) and State export license applications and reviews of scientist engagement projects for export control and proliferation concerns. Under the Warhead and Fissile Material Transparency (WFMT) program, SRNL provided very good support across the WFMT program, including technical initiatives to develop and evaluate future warhead monitoring approaches. SRNL's participation in multi-laboratory activities to develop and assess chain of custody procedures for warhead monitoring, including through collaborative work with the United Kingdom, contributed significantly to the technical quality of the engagement.

SRNS met expectations in the performance of activities defined in the Feed Materials Characterization Plan to improve the characterization of Alternate Feed Stock plutonium materials to be provided as feed to the Mixed Oxide Fuel Fabrication Facility (MFFF). SRNS initiated planning efforts for the HB-Line Safety Class Ventilation Modification General Plant Project with the submittal of a planning statement of work and estimate, and supported the federal review and effort to obtain approval to authorize design and baseline development. Once authorized, a detailed project schedule was submitted and design activities initiated. While the design was initially behind schedule, SRNS successfully mitigated all impacts. SRNS completed development and testing of an alternative recombiner prototype capable of supporting increased loading of plutonium oxide in the interim cans. This initiative and teaming between program and engineering resources should result in cost avoidance for future transportation packaging procurements supporting the AFS-2 campaign.

SRNS provided good support to the MFFF and Waste Solidification Building (WSB) (OPEX) projects (non-construction) with all required actions or deliverables completed on or ahead of schedule. For

the MFFF project, SRNS provided estimating and construction support as well as waste management services, safeguards and security program support.

SRNS was proactive in providing necessary fissile material disposition program/business support functions such as financial management and scheduling support; responded to actions and customer requests for information and briefings, and kept NNSA apprised of emerging issues. SRNS also provided critical support to manage the technical issues that emerged in the program.

SRNS initiated the risk management process for AFS-2 campaign. The risk assessment, while presented as mature, was deficient in content, risk evaluation, and consistency. SRNS was slow to acknowledge and identify corrective actions.

SRNS overcame equipment and resource challenges to complete analysis of four plutonium oxide blend lot samples in support of Los Alamos National Laboratory oxide production and certification as acceptable MFFF feedstock.

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

Summary

Overall, SRNS performed at the **Very Good** level in its ability to manage the Science, Technology, and Engineering and Other DOE Mission Objectives. SRNS performance exceeded the work scope funded throughout FY14. NNSA reviewed the SRNS Self-Assessment and did not agree with the overall assessment of Excellent. Specific observations follow:

Very Good

SRNS is exceeding expectations in supporting weapons Research and Development (R&D) across the Nuclear Security Enterprise (NSE). The Savannah River Tritium Enterprise (SRTE) (Tritium Programs in conjunction with SRNL) is diligently working in collaboration with other NNSA production sites, laboratories and universities to leverage expertise and resources to meet mission requirements.

The Technology Management Council (TMC) continued to provide very effective strategic and tactical oversight efforts in promoting the application of beneficial technologies in both the near and long term tritium sustainability requirements. The TMC exceeded expectations by making considerable progress to address real technology issues that are important for tritium production sustainment through development of a Facility Needs & Capabilities Gaps document, guiding formulation of the FY15 Plant Directed Research and Development (PDRD) projects, as well as providing a baseline for the tritium plants' technology development requirements.

SRTE continued to provide timely and effective tritium research and development support to the weapon design agencies (DAs) for Life Extension Program (LEP) gas transfer system (GTS) development. The Tritium R&D Steering Committee (SRTE & DA representatives) was very effective in identifying needs and monitoring delivery of SRTE support. Internally, SRTE implemented a Tritium R&D Implementation Team to facilitate timely delivery of requested support activities.

Supporting an NSE strategic plan objective of driving an integrated and effective enterprise, SRTE and Los Alamos National Laboratory (LANL) management staff established routine interface engagements to support the LANL Weapons Engineering Test Facility (WETF) material deinventory. In this important mult-year initiative, SRTE support focuses on tritium recovery from deinventoried components based upon effective coordination with LANL counterparts, to identify and characterize components. This effort is just one component in better integrating NSE capabilities and improving enterprise efficiency.

SRTE met expectations for activities supporting staff competencies, facility capabilities, and Enterprise Enhanced Surveillance (ES) and Surety tasks for FY14. SRTE developed a methodology for W76-1 reservoir ultrasonic testing and aging studies on reservoir materials. Additionally, the new Life Storage Secondary Container VI developed by SRNL supports Sandia National Laboratories (SNL) requests for long term exposure studies on reservoirs having no options for reclamation. SRTE continued to support activities advancing the understanding of hydrogen isotope characteristics and their performance through support of Nuclear Safety Research and Development and program support activities

SRTE continues to foster a healthy research environment through collaboration with other organizations such as the Georgia Institute of Technology, Thomas Jefferson National Laboratory Accelerator Facility, and Clemson University on various topics. SRNL staff routinely contributes to technical journals, such as *Fusion Science and Technology* and *Journal of Nanoparticle Research*, through conduct of reviews and submission of articles.

Supporting international cooperation, a SRNL Hydrogen Processing Center Group manager supported Fukishima tritiated water cleanup activities by serving on the Mitsubishi Research Institute review board for cleanup technology selection. Additionally, SRNL received recognition when the local American Chemical Society (ACS) Younger Chemists Committee, chaired by a SRNL scientist, received the ChemLuminary Award for Outstanding Local Section at the ACS National Meeting.

SRTE is advancing technology through Lab Directed Research and Development (LDRD) and Work for Others (WFO) tasks complimentary to tritium competencies. SRTE continues to leverage the efforts being done on LDRD and Work for Other projects (e.g., beta voltaic battery development, detritiation of contaminated water, SHINE, and Micro-TCAP) to offset the limited resources supporting tritium technology applications. SRNL continued to offer Enterprise expertise for a variety of capabilities, such as: ultra-secure wireless networks (LANL), mass spectrometry (SNL, LLNL, and Pantex), and the Plutonium Controlled Potential Coulometer.

SRNL R&D continued to support other Government agencies assessment of capabilities to produce materials by proliferate nations. For example, SRNL supported efforts to detect and prevent the illicit trafficking of nuclear/radiological materials, technology, information and capability. SRNL also provided R&D technology solutions for treaty monitoring; and demonstrated effective operations and implementation of policy in support of emergency management, incident response and nuclear forensics mission support.

Performance Objective 4: Operations and Infrastructure

Summary

Good

Overall, SRNS performed at the **Good** level in their ability to meet the DOE/NNSA mission by ensuring Site Operations and Infrastructure are effectively maintained. NNSA reviewed the SRNS Self-Assessment and did not fully agree with the overall assessment of Very Good. While there were areas where performance was above expectations, there are also areas that were below expectations. Specific observations follow:

SRNS continued to meet all tritium mission programs needs during an unusual and challenging year. The first six months of FY14 included a lapse in government funding that resulted in a partial government shutdown, uncertain government budget funding scenarios, two severe weather incidents and an unplanned site steam outage that significantly damaged the facilities and placed the mission at risk. Despite these challenges, SRNS continued to operate safely, securely and effectively.

SRNS maintained a strong record of commitment to industrial safety performance and environmental compliance. Environmental stewardship remained effective with radioactive and other releases well below established limits. SRNS's safety and health performance continued to be very strong.

SRNS met expectations in developing improvements to address operational, maintenance, and business weaknesses. A Maintenance Excellence Plan (MEP) was developed and incorporated into the Operational Excellence Plan (OEP). This plan is an important element in improving the effectiveness and efficiency of the Maintenance Program to support continued effective operations in a constrained budget environment. The MEP is also implementing the improvements to Work Planning and Control (WP&C) process. SRNS improved the organizational integration of operations, maintenance, and engineering by utilizing appropriate subject matter experts to improve the quality of technical work documents and procedures.

SRNS Safeguards and Security program exceeded expectations and demonstrated proactive engagement during the period using continuous improvement initiatives, safety briefings, the "SRNS 2014 Security Pledge" and Security Blitzes throughout the year to reinforce security awareness. These activities were very beneficial during the opportunities of great distraction caused by the October 2013 lapse in government funding, the November and December holiday periods, and the winter polar vortex and steam outage causing unusual conditions inside and outside the tritium facilities. By highlighting security responsibility, these engagements have ensured personnel keep security first and foremost in their job performance.

The SRNS Incident of Security Concern (IOSC) program continues to makes strides in the reduction of security incidents and improved the communication flow of relevant information to federal oversight. SRNS demonstrated continued progress in the downward trend of security incidents over the past three years. SRNS established a proactive process in implementing Operational Security (OPSEC) and physical security through enhanced walk-downs and surveillances to ensure adequate measures are in place for the protection of classified interest and sustained security awareness.

No-notice Limited Scope Performance Tests (LSPT) on Wackenhut Services Inc. (WSI) demonstrated the appropriate physical security response to tactical security action trigger points. SRNS continues

to extend the lifecycle of the E3S security system under reduced funding and limited logistics support availability, while conducting conceptual design and support for system replacement with the ARGUS system architecture.

SRNS-Tritium led the company, and the Site, in planning for and executing austerity measures due to government funding challenges. Throughout the period SRNS-Tritium business management was proactive and worked collaboratively with SRFO to develop scenarios and feasible alternatives to lessen the adverse impacts on safety and operations due to budget challenges.

SRNS Legal made progress through the year and continues to work towards a global settlement with Baker Construction, the SRNS sub-contractor on the Waste Solidification Building (WSB) construction project.

SRNS performed well in the development and presentation of the base requirements needs for the Tritium Responsive Infrastructure Modernization (TRIM) program sponsorship. This initiative is essential for reliable and efficient Tritium program sustainment of the stockpile and scientific research. SRNS continues to manage and refine the TRIM line-item estimate to support funding and project planning requirements for a FY17 CD-0 milestone.

SRNS-Tritium general plant projects continue to be managed effectively, with all current projects within cost and schedule baselines. Tritium project management aggressively worked to closeout projects and return excess funding to the program. SRNS demonstrated significant initiative to address excess facilities using operating funds, removing excess temporary trailers from the facilities and continued to meet the goals in the management of Facilities and Infrastructure. SRNS was an active participant in the Facilities Disposition Working Group. However, the SRNS response to information requests, such as the risk information sheets and the infrastructure video did not met expectations or delivery schedules.

SRNS provided support in the implementation of the Mission Dependency Index that will team with the BUILDER program to provide risk based decision making capability for facility maintenance and risk assessment. The tritium facilities were selected as a NNSA pilot program to assist in the development of this enterprise risk evaluation capability. SRNS also provides engaged support for the NNSA Enterprise Risk Planning effort.The Waste Solidification Building (WSB) project's construction activities for the 4th Quarter of Fiscal Year (FY) 2014 met expectations, however cumulative FY2014 performance was unsatisfactory with three of the four quarter's performance below expectations. In early FY14, the project data provided by the contractor anticipated the project would miss the August 2015 Critical Decision (CD)-4 date, requiring a project re-plan just two months into FY14. Project performance for the year was consistent with the November 2013 Recovery Plan intended to recover some schedule slippage, but the contractor did not meet its Performance Measurement Baseline, ending the year with a cumulative variance nearly $7M over cost and $3.5M behind schedule. The Construction (Mechanical) Completion Milestone was achieved in the fourth quarter with the subcontractor working to clear the facility punch-list items. Additonally, limited Startup Testing was initiated. This recent performance supports current projections for the achievement of CD-4 within the latest baseline schedule of August 2015 (current forecast for CD-4 is 3rd Quarter FY2015). During FY14 the re-plan a Baseline Change Proposal was executed, which reduced the project scope but changed neither the major milestones nor the TPC, so the schedule recovery was not exclusively performance driven. Requests for Equitable Adjustments (REAs) from the SRNS construction subcontractor now represent the most significant risk to the Total Project Cost (TPC). Nearly $67M in

certified REAs are in dispute, with additional REAs possible. Certified REAs are now in excess of 70% of the original construction sub-contract cost of $91.7M. The Performance Evaluation Plan includes a Site Specific Objective that states: "Complete construction and initiate startup testing of the Waste Solidification Building project in accordance with approved cost and schedule baselines and related work scope as defined in the FY14 WAEP". The site's Earned Value Management System, which is a contractual requirement, has been uncertified since November 2012 and it is not possible to determine if the TPC will be within the baseline due to REAs which SRNS has been unable to resolve in FY14.

Operations and Work Planning throughout the year has been inconsistent and did not meet expectations. During the first half of FY14, SRTE personnel demonstrated exceptional rigor in operations and overcame several challenges to deliver mission commitments in a safe and disciplined manner. Most notably, in January 2014, SRTE personnel implemented various actions in response to an unexpected loss of steam event to the site during a period of severe winter weather. Due to the collaboration among various work groups (Operations, Engineering, Maintenance, etc.) and management's leadership during this critical juncture, the situation was contained and a more serious and costly event was avoided. During the second half of FY14, however, systemic errors and events began to occur as a result of fundamental conduct of operations and work planning lapses in operational discipline. This downturn quickly gathered momentum and resulted in several challenges in July and August performance. During this six week period, a significant operational event occurred almost every week, one of which resulted in a Technical Safety Requirement (TSR) violation. This series of CONOPS events represents the most significant negative performance area for SRNS during FY14. In response to the sub-par performance, SRTE management implemented Senior Supervisory Watches and deployed Conduct of Operations Advisors to the field to reinforce conduct of operations expectations and discipline. The tritium facilities remained in a reduced operational capacity and under increased oversight for nearly 2.5 months in order to restore operational proficiency and discipline. Following the recovery actions, SRNS developed a long-term performance improvement plan to address observed weaknesses in training, procedures and conduct of operations.

Performance Objective 5: Leadership

Summary

Overall performance by SRNS in this Performance Objective is rated as exceeding expectations in its ability to meet NNSA mission by ensuring Leadership is effective in managing safety, security, and programmatic concerns within a fiscally constrained and uncertain environment. The SRNS Contractor Leadership performance was overall rated as **Very Good**. NNSA reviewed the SRNS Self-Assessment and did not agree with the overall assessment of Excellent. Specific observations follow:

Very Good

Continuing the trend from prior years, SRNS continued to increase its engagement across the Nuclear Security Enterprise (NSE), with interagency partners, and with the international community to provide leadership that was beneficial and central to NNSA enterprise priorities and goals.

Significant highlights included:

- Successfully managed the NNSA-SRS mission requirements despite several fiscal and environmental challenges that were disruptive to the workforce.
- Effectively recovered from the FY13 indentified significant performance shortcomings.
- Successfully implemented strategic partnerships across the NSE to resolve technical issues and improve efficiencies on tritium production and sustainability activities.
- Provided strategic vision to the NSE through development of tools to improve the management of enterprise risks and provided a leadership role in the continued development of the strategic performance evaluation planning and partnership process.

Significant challenges included:

- Improving the Continuous Improvement (CI) program to assist in the early identification of downward trends in performance. Most notable deficiency requiring improvement is the performance of first line management and their effectiveness in field management and oversight programs. This was a significant contributor to a number of Conduct of Operations (CONOPS) issues that were experienced in the fourth quarter of FY14. This was the most significant negative performance challenge experience by SRNS-Tritium during FY14.
- Improving the operations and work planning and control execution processes/procedures effectiveness and efficiency. The SRTE contains numerous examples of process and procedures that are overly complex and onerous. These issues could, in many cases, potentially reduce operational safety due to the overly burdensome process.

Two significant SRNS senior leadership changes were made during FY-14. In June 2014, both the SRNS President/CEO and the Senior Vice President for NNSA Operations and Programs were replaced with highly capable executives. While this leadership transition occurred just prior to a number of CONOPS issues within the Tritium Facilities, the leadership transition was not a contributing element

in these issues. The NNSA recognizes and specifically notes that the previous and incumbent SRNS Vice President for NNSA Operations and Programs made positive contributions to the NNSA equities, not only at the Savannah River Site, but across the NSE.

The SRNS leadership team and the SRNS corporate board of directors responded well to the FY13 performance feedback, with improved leveraging of both site and corporate reach back assets to address the two most significant FY13 performance failures, the construction of the Waste Solidification Building (WSB) and the Alternate Feed Stock-2 (AFS-2) projects.

Throughout the fiscal and/or weather challenges of the first, second and third quarters of FY14, which led to significant workforce strain and uncertainty, the leadership team ensured operations were conducted in a safe, secure, effective and responsible manner while supporting the enduring NNSA mission requirements. The fourth quarter introduced a perfect storm of several new challenges to the leadership team in dealing with constrained appropriations, particularly regarding the maintenance funding controls which caused an unforeseen reduction in maintenance personnel and a number of conduct of operations (CONOPS) issues. The magnitude and significance of the number of the CONOPS issues in the Tritium Facilities that came to light in the fourth quarter had direct linkages to failures in the management oversight system that realized a negative performance trend. One of these CONOPS issues resulted in the Technical Safety Requirement (TSR) violation which required a significant reduction in the tempo of the operational cycle while the leadership team focused on improving the Tritium Facilities operational discipline and compliance.

The SRNS leadership team exceeded expectations in displaying significant strategic vision. They have been a frontrunner in supporting the Nuclear Security Enterprise (NSE) strategic and governance improvement initiatives. Specifically, the SRNS leadership team has taken the lead in developing the strategy and tools to improve the strategic pulse on the management of enterprise risk management (ERM) to improve the ability to apply responsive resources and leadership direction more effectively. Additionally, the SRNS team is active in the continued evolution of the enterprise strategic performance evaluation planning process, leading the initiative to provide a more strategically balanced and focused plant and laboratory performance evaluation plan.

The SRNS leadership team has provided a proactive role in developing a GTS/Tritium Enterprise Strategy plan that will be used by the NNSA to address the many programmatic concerns with long term Tritium supply chain sustainability. SRNS provided the technical analysis, alternatives, and recommendations for a tritium sustainability plan that will permit an informed NNSA enterprise risk based decision.

Displaying exceptional site leadership, the Tritium leadership team of SRNS led the company in the planning and execution of austerity measures in preparations for establishing a Safe, Secure and Stable (SSS) condition in response to a lapse in Federal funding in the early stages of the fiscal year. This activity continued through the fiscal uncertainties of the continuing resolution and omnibus funding execution. More strategically, they are responding to the challenge to continuously re-evaluate the way business is conducted to improve the effectiveness and efficiency in utilization of scarce resources. SRNS is responding well to the challenges presented by the SRFO to address significant systemic issues that have been generationally driven requirements by government and contractor reactions to issues, leading to an overly bureaucratic work practice.

Recovering from a once in 200-year ice storm and a previous polar vortex early in the second quarter that significantly impaired plant readiness, the SRNS leadership team overcame all obstacles and continued to meet all Limited Lifetime Component (LLC) requirements in support of the deterrent mission. Demonstrating decisive and responsive leadership, the SRTE leadership team was able to quickly stabilized plant conditions and respond to the crisis to reduce the risk to plant infrastructure while supporting the employee and community concerns. The SRNS leadership team has demonstrated an agile and learning paradigm to investigate and mitigate other potential seams in the SRTE procedures and processes. SRNS has similarly executed well ahead of schedule to meet Level 2 testing and surveillance milestones and is supporting the NNSA National Laboratories in pursuit of all NSE Life Extension Program (LEP) activities.

A significant strategic partnership milestone was achieved when the Tritium R&D Steering committee charter was finalized, providing the strategic framework for an R&D alliance between Los Alamos National Laboratory (LANL), Sandia National Laboratories (SNL) and the Savannah River National Laboratory (SRNL). This enterprise partnership is resulting in improved collaboration on NNSA weapons modernization initiatives, and is exceeding the effectiveness expectations for a program that is still maturing. Additionally, this improved partnership relationship has led to progress in the working group's endeavor to reduce the tritium inventory at LANL's Weapons Engineering Tritium Facility (WETF) and further improve the NSE efficiency in facility utilization of resources.

Both the Technology Management Council and Tritium R&D Implementation Team have shown significant progress in providing the strategic and tactical direction to help mitigate tritium program risk and promote productivity sustainment, efficiency, and effectiveness.

The SRTE Leadership team has been proactively engaged in developing and communicating a strategic and informative base for responsibly managing the aging infrastructure of the Tritium Facility, and thereby working to mitigate the increasing risks to the nuclear deterrent through infrastructure risk reduction. The detailed analysis conducted has been instrumental in ensuring NNSA leadership and program sponsors are fully cognizant of the risks to the deterrent from an aging tritium infrastructure. The tritium enterprise is still challenged to improve a risk management capability to apply similar analytical assessments to operational, maintenance, infrastructure risk under significant budget constraints to improve the risk informed decision making.

Many of the challenges that have been attributed to near-term priority actions have both direct and indirect impacts on the workforce safety culture, a just culture on which SRNS continues to place a high priority in their continuous improvement management process. The SRNS-Tritium leadership team has made significant progress in instilling a level of accountability for performance and responsibility in their leadership team. SRNS has a strong safety record and a maturing Continuous Improvement (CI) program, and there are many areas where CI has demonstrated exceptional performance in quality improvements, workforce engagement, and employee feedback and interactive error reporting communications tools. The SRNS leadership team, however, has demonstrated weakness in providing effective field execution oversight, as will be examined later in this assessment.

SRNS has been a strong supporter of the nuclear nonproliferation (NN) program efforts supporting the Administration's NN goals and objectives. Their leadership in a wide range of NN programs, including the Global Threat Reduction Initiative (GTRI) commitments supporting the 2014 Nuclear Security Summit, was instrumental in reducing the global dangers from proliferant nuclear material.

One of the most challenging leadership tasks that were carried over from FY13 was the management of the Waste Solidification Building (WSB) construction, which has historically failed to meet expectations over the project lifecycle. Responding to the government's feedback from FY13, SRNS took actions early in FY14, utilizing corporate reachback as needed, and was effective in restoring some of the construction completion schedule milestone (CD-4) commitments per the November 2013 construction baseline change. The SRNS LLC team and their Board of Directors have reached back to corporate expertise to assist in the project management of both the WSB project and the AFS-2 plutonium disposition campaign.

Recognizing the importance of commencing plutonium oxide production through the AFS-2 campaign, significant senior leadership support was placed on the H-Canyon operations and program management to bring the necessary resources to bear on an underperforming program. These actions resulted in displaying proof of concept of plutonium oxide production in late FY14 and beginning a program to ramp up towards full plutonium oxide production commitments.

Leveraging additional corporate resources, all corporate partners have been responsive in bringing vital resources to bear in addressing an identified SRNS significant weakness in procurement and logistics management. Recognizing a significant deficiency in the administration of their site-wide procurement system, an initiative principally driven by the SRNS-Tritium leadership team, SRNS took action to develop a Plan of Action and Milestones (POAM) to resolve training, process and procedure problems to fix a broken procurement system. Utilizing corporate reachback from all three SRNS LLC companies, this holistic review is helping to alleviate one of the most systemic inefficiencies on the SRS.

SRNS effectively utilizes a Management Assurance System (MAS) to permit both contractor and federal oversight of business, operations, maintenance, and quality assurance performance. Partnering closely with the SRFO, SRNS leadership team continuously strives to improve the mission execution performance, effectiveness, efficiency and transparency. The SRNS management team is continuously exploring new tools toward identifying and analyzing leading indicators to anticipate potential issues before they reach a significant level. Regarding the CONOPS issues experienced during the fourth quarter, there were latent metric indicators available that showed a negative performance trend, and the leadership team had begun to take pre-emptive action to address issues, but neither the actions nor the indicators anticipated the level of issues discovered during the short period of CONOPS issues. Following the lessons learned from the CONOPS issues, SRNS is modifying metrics to help improve or develop better operational leading indicators. Additionally, SRNS has performed initial development of metrics and indicators to help manage critical competency and technology gaps in support of technology maturation and research and development.

SRNS performance in taking proactive action to mitigate or prevent several CONOPS issues has room for significant improvement. The declining level of discipline in the performance of work and the inability of the management team to detect and mitigate substandard levels of operation, some of which was evident by precursor metrics, led to a significant number of CONOPS issues in the fourth quarter of FY14. The nature of these CONOPS issues was the most significant adverse trend(s) for SRNS-Tritium in FY14, and was unprecedented in recent history. The CI program was demonstrated to be not effective in the identification and corrective action taken to operational issue. As an example, the Management Field Observation (MFO) program was demonstrated to be less than effective, as many of the common contributing issues to the CONOPS issues in the fourth quarter should have been identified and corrected through a more robust MFO process of the leadership

team. Additionally, as was further identified in the CONOPS recovery, there was a systemic failure of the leadership and management team to identify and correct a significant number of process and procedure shortcomings.