**Department of Energy**
**National Nuclear Security Administration**
Washington DC 20585

November 30, 2017

OFFICE OF THE ADMINISTRATOR

MEMORANDUM FOR NICOLE NELSON-JEAN
MANAGER
SAVANNAH RIVER FIELD OFFICE

FROM: WILLIAM I. WHITE [redacted]
ASSOCIATE PRINCIPAL DEPUTY ADMINISTRATOR

SUBJECT: Savannah River Nuclear Solutions, LLC, DE-AC09-SR22470
Fiscal Year 2017 Award Fee Determination

The National Nuclear Security Administration (NNSA) has completed its assessment of Savannah River Nuclear Solutions (SRNS), LLC's, performance of the contract requirements for the period of October 1, 2016 through September 30, 2017, as evaluated against the Goals defined in the NNSA Corporate Performance Evaluation and Measurement Plan (PEMP) and the Office of Environmental Management PEMP for the Savannah River National Laboratory (SRNL). Based on assessments provided in the NNSA Performance Evaluation Report, award fee amounts are as follows:

| | At Risk % | Available | Final | Percent |
|---|---|---|---|---|
| **NNSA Strategic PEMP Goals** | | | | |
| Goal 1: Manage the Nuclear Weapons Mission | 33% | $5,175,868 | $4,658,281 | 90% |
| Goal 2: Reduce Nuclear Security Threats | 16% | $2,509,512 | $2,283,656 | 91% |
| Goal 3: DOE & Strategic Partnership Project Mission Objectives | 0% | $0 | $0 | N/A |
| Goal 4: Science, Technology & Engineering (ST&E) | 0% | $0 | $0 | N/A |
| Goal 5: Operations & Infrastructure | 41% | $6,430,623 | $4,822,968 | 75% |
| Goal 6: Leadership | 10% | $1,568,445 | $1,333,178 | 85% |
| Total (NNSA Strategic PEMP) | | $15,684,448 | $13,098,083 | 84% |
| **SRNL PEMP Goals** | | | | |
| Goal 1.07: Defense Programs | | $700,000 | $637,000 | 91% |
| Goal 1.08 Nuclear Nonproliferation | | $1,300,000 | $1,235,000 | 95% |
| Total (SRNL PEMP) | | $2,000,000 | $1,872,000 | 94% |


# National Nuclear Security Administration

# Savannah River Nuclear Solutions, LLC

# Performance Evaluation Report (PER)

NNSA Savannah River Field Office

Evaluation Period:
October 1, 2016 - September 30, 2017

November 8, 2017

# Executive Summary

This Performance Evaluation Report (PER) provides the National Nuclear Security Administration (NNSA) assessment of Savannah River Nuclear Solutions, LLC (SRNS), performance of the contract requirements for the period of October 1, 2016 through September 30, 2017, as evaluated against the Goals defined in the applicable Performance Evaluation and Measurement Plans (PEMPs)*. The NNSA took into consideration all input provided (e.g. CAS, Program Reviews, etc.) from NNSA Program and Functional Offices both at Headquarters and in the field.

The work performed for NNSA programs at the Savannah River Site (SRS) is conducted by SRNS under Management and Operating (M&O) Contract for Fiscal Year 2017. This is a Department of Energy (DOE) Office of Environmental Management (EM) contract under which NNSA-funded and directed work is performed.

*Note: SRNS's performance for Fiscal Year (FY) 17 on NNSA efforts are measured against two separate PEMPs, the NNSA Corporate PEMP and a separate Office of Environmental Management (EM) PEMP for the Savannah River National Laboratory (SRNL). The NNSA Corporate PEMP consists of six (6) Performance Goals supplemented with Objectives and Key Outcomes (KOs) for each Goal. Fee is distributed among the six (6) Goals as specified in the PEMP. For SRNS, Goals 3 and 4 are not applicable and therefore have no associated fee. The work measured against the NNSA Corporate PEMP is discussed under Goals 1 through 6 below. The work measured against the EM PEMP for SRNL is discussed under SRNL Performance Goals 1.07 (Previous Goal 4) and 1.08 below.

SRNS earned Excellent ratings on Goal 2 and SRNL Goals 1.07 and 1.08, exceeding expectations on nearly all applicable Objectives and Key Outcomes. SRNS continues to effectively execute the Nuclear Nonproliferation Program and research missions. SRNS earned Very Good ratings on Goals 1 and 6 by exceeding expectations on many Objectives and Key Outcomes with relatively few issues. Savannah River Tritium Enterprise (SRTE) delivered all limited-life components on schedule while maintaining excellent product quality. SRNS earned a Good rating in Goal 5 by exceeding some of the Objectives and Key Outcomes while experiencing some issues in Conduct of Operations, Production Discipline (quality control), Facility Maintenance Implementation, and Small Project Execution.

Performance against the NNSA Corporate PEMP Goals summarized below, resulted in an overall rating of Very Good for SRNS. Specific observations for each Goal are provided in the following pages.

## Goal 1: Manage the Nuclear Weapons Mission (33%) Very Good

SRNS earned a rating of Very Good, and 90% of the award fee allocated to this goal. SRNS exceeded many of the Objectives and Key Outcomes, and generally met the overall cost, schedule, and technical performance requirements of the contract under this Goal. The contractor has continued to be successful in its performance under this contract as described below. No significant issues in performance were found.

Overall, SRNS's performance was above expectations in management of the Nuclear Weapons Mission. Savannah River Tritium Enterprise (SRTE) delivered all limited-life components on schedule while maintaining excellent product quality. SRTE exceeded the goals for Surveillance function tests, evaluations, and reports supporting the stockpile and Life Extension Programs (LEPs). SRTE conducted an effective Readiness Assessment and was authorized to restart the Tritium Extraction Facility (TEF) following a period of inoperations exceeding 12 months. TEF subsequently performed three extractions in one year for the first time in TEF's 10-year history. Other notable accomplishments included the relocation and initial operation of a new hydroburst tester, which supported the closure of the Reclamation Facility.

SRNS completed all FY17 Gas Transfer Function Test and Destructive Examinations while recovering FY16 deferrals. Additionally, SRNS executed several activities for the B61-12 Gas Transfer System (GTS) Subsystem/Component development and production ahead of schedule.

SRNS continues to meet all Limited Life Component Production Control Directive (PCD) requirements on time ensuring no weapon goes red. However, late in FY17, production issues resulted in process changes which consumed valuable resources and increased schedule risk.

SRNS met the Advanced Manufacturing Development deliverables supporting gas and reservoir processing development. However, SRNS did not properly handle several challenges associated with the procurement and installation of a new Additive Manufacturing machine. The project has taken over two years and SRNS projected the project to exceed its initial cost estimates by approximately two million dollars.

## Goal 2: Reduce Nuclear Security Threats (16%) EXCELLENT

Under this goal, SRNS earned a rating of Excellent, and 91% of the award fee allocated to this goal. SRNS exceeded almost all the applicable Objectives and Key Outcomes, and generally met the overall cost, schedule, and technical performance requirements of the contract under this Goal in the aggregate. Of note, SRNS responded promptly and proficiently to multiple directed changes, remaining flexible and continuing to focus their teams on executing priority work scope.

SRNS led a challenging multi-site collaborative program integration effort in making significant progress on the Surplus Plutonium Disposition Life Cycle Cost Estimate (LCCE) for the Dilute and Dispose approach, and remains on target to deliver the LCCE to NNSA in FY 2018. SRNS completed the conceptual design activities required to support the Department's FY 2018 budget submittal for the project to add Dilute and Dispose capability at SRS and supported the project Analysis of Alternatives.

SRNS provided exceptional support and integration between NNSA and the Office of Environmental Management (EM) plutonium disposition activities including documenting the justification for termination of safeguards and defining a strategy to implement independent monitoring in K-Area. For the De-cladding and Conversion project, SRNS provided support in project planning and completed a feasibility study evaluating existing technologies and facilities in the complex capable of meeting the mission need.

SRNL continued to provide effective technical support to ongoing receipts of Canadian National Research Universal/National Research Experimental (NRU/NRX) spent nuclear fuel and Target Residue Material (TRM) shipments.

SRNS provided key support to the Office of Nonproliferation and Arms Control, including support to international safeguards, nuclear export controls, and verification. SRNS provided key support and leadership under the Quad Nuclear Verification Partnership, and proactively worked with other international working group members to plan and execute activities for the international exercise with our partner countries of Norway, Sweden, and the United Kingdom. SRNL completed its first Nuclear Material Round Robin as a qualified member in the International Atomic Energy Agency's (IAEA's) Network of Analytical Laboratories and met all requirements to maintain certification.

## Goal 3: DOE and Strategic Partnership Projects Mission Objectives (0%) N/A

This goal is N/A for Savannah River.

## Goal 4: Science, Technology, and Engineering (ST&E) (0%) N/A

All work under this Goal is covered in a separate Office of Environmental Management (EM) PEMP for the Savannah River National Laboratory and are discussed later in this report under SRNL Performance Goals 1.07 and 1.08.

## Goal 5: Operations and Infrastructure (41%) GOOD

SRNS earned a rating of Good, and 75% of the award fee allocated to this goal. SRNS exceeded some of the Objectives and Key Outcomes, and has met the overall cost, schedule, and technical performance requirements of the contract under this Goal.

Overall, SRNS's performance exceeded or met expectations in safety, health, safeguards and security, information technology and cyber security, business operations and financial management, as well as management of legal risks. However, areas of concern were identified during the period in Conduct of Operations and Production Discipline (quality control). In addition, Facility Maintenance Implementation and Small Project execution continue to have issues that were identified in FY16.

In early 2017, SRNS experienced multiple operational events and failed to effectively manage the safety basis requirements for the Tritium Facilities. These events increased schedule risk and costs.

During FY16, areas of concern were identified in the SRTE facilities maintenance program. Small improvements in reducing the corrective maintenance backlog and preventative maintenance deferrals have been made, nonetheless, problems remain. SRNS has completed most small project milestones on time or ahead of schedule. However, SRNS did not manage the overall program effectively. Small Projects execution rate continues to be very low and SRNS is not prepared to execute projects when funding is available, resulting in equipment repairs and replacements being delayed and subsequent cost escalation.

SRTE security posture has improved. Argus installation is proceeding and the Security Risk Assessment was completed to implement the Design Basis Threat and NA-70 guidance. SRNS demonstrated a strong commitment and awareness to worker safety and health during the reporting period achieving over two million man-hours without a Days Away Restrictions and Transfers (DART) Case and over 27-months without a medical treatment (MRT) case. To address current demands and anticipated attrition and to expedite operator training, SRTE implemented a new initiative to train new employees in unclassified environments. SRNS completed the Readiness Assessment for TEF extraction operations and accomplished three consecutive extractions. SRNS submitted the Tritium Facilities and the TEF Documented Safety Analyses (DSA), as well as the combined DSA that incorporated the new dispersion modeling.

## Goal 6: Leadership (10%) VERY GOOD

SRNS earned a rating of Very Good, and 85% of the award fee allocated to this goal. SRNS exceeded many of the Objectives and Key Outcomes, and generally met the overall cost, schedule, and technical performance requirements of the contract under this Goal.

SRNS proactively engaged in the development and implementation of a strategic plan managing the aging infrastructure of the Tritium Facility. SRNS provided exceptional support in the development of an enterprise-wide effort to develop a life-cycle cost estimate for the Surplus Plutonium Disposition Dilute and Dispose initiative. SRNS continued the implementation of the Tiered Operating Production System (TOPS) and the use of other improvement initiatives such as A3 Improvement Process and LEAN Rapid Improvement Event (RIE). Safety has been a strong area for SRTE with over two million man-hours without a DART Case. SRNS demonstrated exceptional leadership in the preparation and management of the site and facilities during two natural disaster events.

SRNS current efforts to address SRTE staffing shortfalls, due to a high number of personnel transfers/ retirements, have not yet stemmed the loss in some critical skill areas. SRNS has implemented a new plan, to streamline hiring and training processes. However, a greater emphasis on recruitment and retention on critical skill resources should be the goal.

The SRTE facilities maintenance program continues to have issues that were already identified in FY16. Small improvements in reducing the corrective maintenance backlog and preventative maintenance deferrals have been made, however, problems remain. In addition, SRNS must increase their efforts to improve the execution of the overall maintenance program. Some of the execution issues are tied to the staffing shortfalls mentioned above. Small Projects execution rate is very low and SRNS is not prepared to execute projects when funding is available. Also, SRNL had challenges associated with the procurement and installation of a new Additive Manufacturing machine resulting in schedule and cost overruns.

Following a period of poor operational discipline and performance, the SRNS leadership, developed a plan to manage the facility under a period of Disciplined Operations, while conducting multiple internal/ external reviews to develop focused improvements. SRNS conducted a holistic evaluation and developed an improvement plan to correct the performance deficiencies. In the fourth quarter, SRNS encountered production issues and increased schedule risk. SRNS brought new leadership experience into the organization and developed a new process for conducting critical and performance self-assessments and employee engagements. Implementation of these new initiatives will be evaluated during the FY18 performance evaluation process.

Resumption of HB-Line oxide production operations, required timely completion of three Commercial Grade Dedication (CGD) packages and directly benefited from SRNS improvements over the past year, relative to the previous CGD process/program.

## SRNL Performance Goal 1.07: Defense Programs — Excellent

Under this goal, SRNL earned a rating of Excellent, and 91% of the award fee allocated to this goal. SRNL exceeded almost all the award-fee criteria, and generally met the overall cost, schedule, and technical performance requirements of the contract under this Performance Goal in the aggregate. No significant issues in performance were noted.

SRNL focused on effective collaboration with other laboratories, as well as the SRTE Engineering and Operations groups, to advance knowledge in tritium related technologies. SRNL conducted evaluations of two on tritium-exposed aluminum vessels focusing on burst results, storage and fill history in collaboration with Sandia National Laboratories, California (SNL-CA). SRNL mounted tritium-contaminated samples from Lawrence Livermore National Laboratory (LLNL) for evaluation of material aging data of significant interest in collaboration with SNL-CA. SRNL evaluated tritium effects on aluminum cracking thresholds and tritium loading of an aluminum vessel to support a Thomas Jefferson National Accelerator Facility (TJNAF) experiment intended to gain better understanding of nucleons.

SRNL supported SRTE with provisions of multiple specialty tools and technical assistance with Hydro-burst activities. Hydro-burst was formally turned over to operations in May with the first burst completed in June. SRNL installed and operated new remote Metallography equipment at the Materials Test Facility. This equipment allows for reduced cycle times in completion of metallurgical evaluation of surveillance reservoirs and reduces footprint in the sash hood while simultaneously expanding characterization capabilities.

Professional development or outreach activities for SRNL staff have included participation in technical society activities and submittal to or review of technical publications. Outreach activities included two summer interns presenting results of nanotechnology research performed at SRNL at the American Chemical Society Southeastern Meeting and a presentation on the tritium fuel cycle provided at USC-Aiken. Also, SRNL has implemented a shadowing program for SRNL researchers and Tritium Processing Engineers providing researchers a chance to learn about daily tritium operations and technology needs.

SRNL is effectively implementing twelve Plant Directed Research and Development (PDRD) projects that siginificantly support the tritium mission in the areas of absorption, passivation, glovebox handling tools, and tritium aging.

## SRNL Performance Goal 1.08: Nonproliferation — Excellent

Under this goal, SRNL earned a rating of Excellent, and 95% of the award fee allocated to this goal. SRNL exceeded many of the award-fee criteria, and generally met the overall cost, schedule, and technical performance requirements of the contract under this Performance Goal in the aggregate. No significant issues in performance exist. SRNL

provided technical support and expertise to the Global Material Security Office of International Security, the Office of Material Management and Minimization's ($M^{3)}$ Molybdenmum-99 (Mo-99), Research Reactor Conversion, Gap Removal, and Emerging Threats programs and the Office of Nonproliferation and Arms Control.

SRNL provided key technical support for $M^3$'s U.S. High Performance Research Reactor (USHPRR) Project. As the lead on cross-cutting issues within the USHPRR project, SRNL produced a scrap recovery options report, updated a packaging and transportation planning document, finalized a post-irradiation examination options report, and led an independent technical review of the Fuel Fabrication Pillar. The technical quality of their work exceeded expectations and SRNL performed the authorized scope within budget.

SRNL provided excellent technical support to the Arak Modernization Working Group under the Joint Comprehensive Plan of Action (JCPOA).

SRNL provided quality technical development and support to the NNSA Mo-99 Program furthering the program's objective to accelerate establishment of domestic Mo-99 production, thereby reducing the use of HEU in medical isotope production.

SRNL provided effective analysis and support for the ongoing effort to reconcile U.S.-origin separated plutonium exports.

SRNL provided outstanding technical support for the preparation and receipt of both Target Residue Material and NRU/NRX spent fuel shipments from Canada.

SRNL provided key support for the Emerging Threats mock deployment and future planning activities, and the team worked to develop a strategy for the next generation Emerging Threats capabilities.

There is no fixed fee related to the SRNS contract. The total fee summary is provided below for your information.

| | | |
|---|---|---|
| **Total Summary** | **$17,684,448** | **$14,970,083** |