



Independent Assessment of Conduct of Operations at the Savannah River Site H-Canyon Facility

July 2026



U.S. DEPARTMENT
of **ENERGY**

Office of Enterprise
Assessments

Table of Contents

Acronyms.....	ii
Executive Summary.....	iii
1.0 Introduction.....	1
2.0 Methodology.....	1
3.0 Results.....	2
3.1 Organization and Administration.....	2
3.2 Shift Routines and Operating Practices.....	3
3.3 Control Area Activities.....	3
3.4 Communications.....	4
3.5 On-shift Training.....	5
3.6 Investigation of Abnormal Events, Conditions, and Trends.....	5
3.7 Notifications.....	7
3.8 Control of Equipment and System Status.....	7
3.9 Lockout and Tagouts.....	8
3.10 Independent Verification.....	9
3.11 Logkeeping.....	9
3.12 Turnover and Assumption of Responsibilities.....	10
3.13 Control of Interrelated Processes.....	11
3.14 Required Reading.....	11
3.15 Timely Instructions/Orders.....	11
3.16 Technical Procedures.....	12
3.17 Operator Aids.....	13
3.18 Component Labeling.....	13
3.19 Federal Oversight.....	14
4.0 Best Practices.....	15
5.0 Findings.....	15
6.0 Deficiencies.....	15
7.0 Opportunities for Improvement.....	16
Appendix A: Supplemental Information.....	A-1

Acronyms

CFR	Code of Federal Regulations
CONOPS	Conduct of Operations
CRAD	Criteria and Review Approach Document
CTS	Commitment Tracking System
DOE	U.S. Department of Energy
DOE-SR	DOE Savannah River Operations Office
EA	Office of Enterprise Assessments
EM	Environmental Management
FLM	First Line Manager
LOTO	Lockout/Tagout
MFO	Management Field Observation
MRB	Management Review Board
OFI	Opportunity for Improvement
ORPS	Occurrence Reporting and Processing System
PA	Public Address
SC	Significance Category
SOM	Shift Operations Manager
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
SSCs	Structures, Systems, and Components
STE	Shift Technical Engineer
TSR	Technical Safety Requirement

INDEPENDENT ASSESSMENT OF CONDUCT OF OPERATIONS AT THE SAVANNAH RIVER SITE H-CANYON

Executive Summary

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted an independent assessment of conduct of operations (CONOPS) program implementation at the Savannah River Site H-Canyon in January and February 2026. H-Canyon is a hazard category 2 nuclear facility and is managed by the site management and operating contractor, Savannah River Nuclear Solutions, LLC (SRNS), which is overseen by the DOE Savannah River Operations Office (DOE-SR), within the Office of Environmental Management (EM) program office. The primary objective of the assessment was to evaluate the effectiveness of SRNS's activities to manage and maintain an appropriate CONOPS program at H-Canyon. The assessment also evaluated the effectiveness of the Federal oversight provided by DOE-SR relating to CONOPS.

EA identified the following strengths, including two best practices:

- SRNS's apprenticeship program effectively provides initial training to apprentices in CONOPS fundamentals and facility-specific training that allows students to successfully enter the qualification process. (Best Practice)
- When effectiveness reviews are required, the SRNS Commitment Tracking System (CTS) automatically generates their due dates upon closure of the final corrective action associated with the issue. Additionally, corrective actions that are required to prevent recurrence are triggered by CTS for independent verification prior to closure. (Best Practice)
- Operations personnel and shift technical engineers displayed professionalism, knowledge of CONOPS, and excellent command and control.
- The *EMO* [Environmental Management Operations] *Conduct of Operations Excellence Plan* and *Environmental Management Operations CONOPS Improvement and Sustainability Plan* have been effectively established and implemented to drive process improvements in CONOPS over the past three years.

EA also identified several weaknesses, as summarized below:

- SRNS corrected but did not enter an issue associated with inadequately manufactured crane rail shoes into CTS, so it was not evaluated for extent of condition and trending.
- SRNS did not meet required DOE Occurrence Reporting and Processing System (ORPS) categorization timelines for 7 of 12 reviewed events.
- Equipment configuration has not always been maintained, including out-of-service components that were not labeled as being out of service and, in some cases, were electrically energized or pressured with instrument air.
- Some temporary labels on the process air system have been in place for over a year and were not being tracked for permanent label replacement.
- Clear expectations for notifications of sub-reportable events between H-Canyon staff and DOE Facility Representatives have not been established.
- Compensatory measures established through a standing order in response to newly identified material at risk were not incorporated into formal implementing procedures; as a result, certain controls, including combustible loading limits, lacked a defined mechanism for periodic verification to ensure sustained compliance.

In summary, SRNS has established a generally effective CONOPS program at H-Canyon supported by an apprenticeship program, tailored training programs, effectiveness reviews, and ongoing improvement initiatives. However, the concerns highlighted in this report – including issues management, timely ORPS categorizations and notifications, configuration of out-of-service components, and integration of compensatory measures into formal procedures – reveal important weaknesses in implementation rigor and procedural adherence. Until these concerns are effectively addressed and corrected, they could diminish the assurance that CONOPS requirements are consistently met.

INDEPENDENT ASSESSMENT OF CONDUCT OF OPERATIONS AT THE SAVANNAH RIVER SITE H-CANYON

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Nuclear Safety and Environmental Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of the effectiveness of conduct of operations (CONOPS) program implementation at the Savannah River Site (SRS) H-Canyon. H-Canyon is managed by the site management and operating contractor, Savannah River Nuclear Solutions, LLC (SRNS), which is overseen by the DOE Savannah River Operations Office (DOE-SR). The assessment was conducted in January and February 2026.

In accordance with the *Plan for the Independent Assessment of the Conduct of Operations Program at the Savannah River Site H-Canyon Facility, March 2026*, the primary objective of the assessment was to evaluate the effectiveness of SRNS's activities to manage and maintain an appropriate CONOPS program at H-Canyon. Additionally, the assessment evaluated the effectiveness of DOE-SR oversight of SRNS's activities with respect to the CONOPS program.

H-Canyon is a hazard category 2 nuclear facility located within the central portion of SRS. The facility began operations in the early 1950s, and its primary mission was to recover uranium and neptunium from fuel tubes used in nuclear reactors at SRS. After the end of the Cold War, its mission changed to nonproliferation and environmental cleanup. In 2022, SRS received approval to move forward with a new mission, Accelerated Basin De-inventory, to dissolve the spent nuclear fuel stored in the L-Area disassembly basin. The dissolved material is then transferred to the SRS liquid waste program for vitrification and onsite temporary storage.

2.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*, which EA implements through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. This report uses the terms "best practices, deficiencies, findings, and opportunities for improvement (OFIs)" as defined in the order.

As identified in the assessment plan, this assessment considered requirements related to CONOPS program performance. EA used objectives and criteria from EA CRAD 31-39, Revision 0, *Review of Conduct of Operations*, to guide this assessment. In addition, elements of EA CRAD 30-07, Revision 1, *Federal Line Management Oversight*, were used to collect and analyze data on DOE-SR oversight activities.

EA examined key documents, such as system descriptions, work packages, procedures, manuals, analyses, policies, and training and qualification records. EA also interviewed key personnel responsible for developing and executing the associated programs; observed operations and maintenance activities; and walked down significant portions of selected H-Canyon and support facilities, focusing on CONOPS performance. The members of the assessment team, the Quality Review Board, and the management responsible for this assessment are listed in appendix A.

There were no previous EA findings to follow up on during this assessment.

3.0 RESULTS

3.1 Organization and Administration

This portion of the assessment evaluated SRNS's established CONOPS organization and administration.

SRNS has adequately documented its CONOPS program in accordance with DOE Order 422.1, *Conduct of Operations*, attachment 2, requirement 2.a. The documented program consists of a program manual (Manual 2S, *Conduct of Operations*) that includes adequate procedures for CONOPS adherence. Manual 2S, Procedure 5.1, *Facility Operations Organization and Administration*, provides an adequate description of the SRNS organizational structure, including the H-Canyon facilities, and provides administrative guidance and requirements to control operations activities. Procedure 221-H-6043, *Conduct of Operations Clarifications/Expectations*, provides appropriate additional clarification guidance for some routine operating practices. Manual 2S, Procedure 5.1, adequately defines roles, responsibilities, authorities, and accountabilities for operations personnel.

Effective organizational and administrative practices that support personnel adherence and proficiency in safety protocols are evident at H-Canyon. Interviews with two first line managers (FLMs), six facility operators, a shift technical engineer (STE), and a shift operations manager (SOM) confirmed a clear understanding of their roles and responsibilities. Interviewed personnel adequately demonstrated knowledge of reporting requirements (e.g., proper notification of system status changes) and critical operational parameters (e.g., dissolver tank status, acid recovery unit temperature and feed tank level instrumentation status, circulated cooling water system status, nuclear incident monitoring alarm system status, and ventilation systems status). Furthermore, a review of training and qualification records for each interviewee confirmed their full qualification status. All observed personnel followed procedural instructions specified in operating and rounds procedures.

SRNS's commitment to operational excellence is evident in its staffing, oversight mechanisms, and continuous improvement initiatives. Observed shift staffing levels for all operational roles, including control room, building, and field operators, were appropriate. Reviewed mandatory monthly management field observations (MFOs) conducted by FLMs appropriately covered multiple operational areas. Reviewed minutes of monthly CONOPS and human performance indicator (HPI) committee meetings appropriately addressed procedural updates, watchbill enhancements, and HPI strategies, demonstrating a commitment to continuous improvement. The establishment and implementation of SRNS-RP-2025-01281, *EMO* [Environmental Management Operations] *Conduct of Operations Excellence Plan*, and SRNS-RP-2022-00175, *Environmental Management Operations CONOPS Improvement and Sustainability Plan*, have resulted in process enhancements over the past three years associated with MFOs, self-assessments, pre-job briefings, scorecard metrics, housekeeping assessments, and observations by the management review board (MRB), a formal forum that reviews performance trends, issues, and corrective actions.

The SRNS apprenticeship program is considered a **Best Practice** because it effectively enhances the CONOPS program by providing apprentices with robust initial training through a six-month technical program. This foundational training is delivered in partnership with Aiken, Denmark, and Augusta Technical Colleges and covers important topics, such as CONOPS, hazardous energy control, and facility-specific training. Apprentices divide their time between college and onsite training, which includes computer-based learning. Interviewed managers stated that, upon successful completion of the program, apprentices who transition to building or field operator positions are well-prepared to begin their initial qualification process.

SRNS conducts adequate field monitoring and self-assessments of H-Canyon operations. Self-assessments of CONOPS are appropriately required by Manual 12Q, *Assessment Manual*, Procedure SA-1, *Self-Assessment*. Reviewed self-assessments performed over the past 2 calendar years appropriately addressed the 18 elements of DOE Order 422.1. Reviewed MFOs of operations were adequately performed by designated management or staff and documented in the corrective action system monthly as required by Manual 22Q, *Contractor Assurance System*, Procedure MFO-1, *Management Field Observation Program*. During an observed weekly MRB meeting, managers appropriately reviewed performance metrics, MFO reports, overdue corrective actions, and emerging topics, demonstrating effective engagement with field personnel and attention to operational performance; attendees identified possible trends and potential focus areas for future observations.

Organization and Administration Conclusions

SRNS has established and implemented an adequate CONOPS program. Interviewed personnel demonstrated a thorough understanding of their roles and responsibilities. Observed shift staffing levels were appropriate. CONOPS committee meetings demonstrate a commitment to continuous improvement, and the excellence and sustainability plans have contributed to process improvements over the past three years. The SRNS apprenticeship program is considered a best practice.

3.2 Shift Routines and Operating Practices

This portion of the assessment evaluated SRNS's established shift routines and operating practices.

SRNS has established and implemented effective shift routines in Manual 2S, Procedure 4.4, *Shift Routines and Operating Practices*, in accordance with DOE Order 422.1, attachment 2, requirement 2.b. This procedure appropriately includes requirements for inspections, equipment checks, and the use of round sheets (data sheets that identify important equipment and acceptable equipment instrumentation readings). These requirements were properly incorporated into Manual 2S, Procedure 5.4, *Round Sheets*. This procedure provides adequate instructions and data recording forms for all facility equipment rounds and surveillances to ensure system functionality, enable performance trends analysis, and appropriately specify response to out-of-tolerance equipment indicators. In addition, reviewed morning and afternoon round sheets completed January 29 through February 5, 2026, demonstrated required performance.

SRNS has also established and implemented effective operating practices to ensure that shift operators are alert, informed of conditions, and operating equipment properly. Manual 2S, Procedure 4.4, effectively provides instructions for all operators, including the Operations Manager, regarding current and changed facility status and authority to operate equipment. It also appropriately states that a trainee may manipulate controls only in the presence of or under the direct supervision of a qualified/certified operator/trainer evaluator. Interviews and numerous observations of a SOM, eight operators, and two STEs confirmed their understanding of the requirements for shift routines and cognizance of current facility conditions. During observations, operations personnel and the STEs displayed professionalism, knowledge of CONOPS, and excellent command and control.

Shift Routines and Operating Practices Conclusions

SRNS has established and implemented effective shift routines and operating practices in operating procedures. Facility equipment rounds and surveillances are appropriately required by procedure and were effectively performed during the assessment.

3.3 Control Area Activities

This portion of the assessment evaluated SRNS's control area procedures and operations practices.

SRNS has established and implemented adequate control area operations practices in accordance with DOE Order 422.1, attachment 2, requirement 2.c. Manual 2S, Procedure 5.3, *Control Area Activities*, appropriately addresses control area access, specifies positions with unencumbered access, and establishes expectations for personnel in the control area. The procedure further establishes appropriate protocols for entry into the at-the-controls area to limit access and maintain focus on facility operations. Observed control room operators in the 221-H and 211-H control rooms consistently exhibited adequate surveillance of control panels, trending of key facility performance parameters, and the ability to respond in a timely manner to identify and correct abnormalities and out-of-specification conditions. Effective adherence to Manual 2S, Procedure 5.3, was observed through operator responses to alarms during the performance of calibration procedure H-782054, *Water Monitor, Maintenance and Source Calibration 281-4H and 281-6H*, and to an annunciator alarm in the 211-H control room, when the operator acted in accordance with procedure 211-H-ARP-17B-2-2A, *Tank E1-1 Low Temp*.

Operations at 221-H and 211-H exhibited strong adherence to safety protocols and operational standards. Two reviewed active standing orders (STO-HCA-25-00004, *Compensatory Measures for Potential Incorrect MAR and Fire Accident Progression Assumptions in OF-H Segregated Solvent Tanks (PISA PI-2025-0027)*; and STO-HCA-25-00003, *Hazardous Energy Work Release Questions*) were well written in accordance with Manual 2S, Procedure 4.5, *Timely Orders to Operators*. Observations in the 221-H and 211-H control rooms confirmed effective control area access with clearly defined boundaries controlled by appropriate postings and carpet colors. Observed individuals properly requested access from control area personnel and stated their purpose prior to entry. During observations in the 221-H and 211-H control rooms, facility operators demonstrated understanding of current facility conditions and displayed professional, formal, and disciplined behavior. Reviewed watchbills for the 221-H and 211-H control rooms from February 2 through February 6, 2026, adequately assigned operating staff with required qualifications, meeting minimum staffing requirements consistent with technical safety requirements (TSRs).

Control Area Activities Conclusions

SRNS has established and implemented adequate control area operations practices. Control area operations, including entry controls, were performed properly and in a disciplined and professional manner by operations personnel.

3.4 Communications

This portion of the assessment evaluated SRNS's operations communications practices.

SRNS has established and implemented adequate operations communications practices in accordance with DOE Order 422.1, attachment 2, requirement 2.d. Manual 2S, Procedure 2.2, *Communications*, provides appropriate guidance for accurate, unambiguous communications among operations personnel during emergencies and normal operations, including appropriate protocols for face-to-face, phone, radio, and public address (PA) communications.

Control area operators used appropriate radio and phone communications during several observed activities. Operators made proper use of repeat-back communications, although the use of the phonetic alphabet varied. The PA system was appropriately used solely for normal operational situations. PA

dead zones were appropriately identified in standing order OA-21-0000, *PA Dead Zone Locations for 221/211-H*, with the areas properly posted.

Communications Conclusions

SRNS has established and implemented adequate operations communications practices, which were adequately performed during observed activities. This included clear protocols for communicating operational status and ongoing operational activities.

3.5 On-shift Training

This portion of the assessment evaluated SRNS's procedures and practices for operator on-shift training.

SRNS has established and implemented adequate operations procedures that control on-shift training in accordance with DOE Order 422.1, attachment 2, requirement 2.e. Manual 2S, Procedure 3.2, *Control of On-Shift Training*, includes appropriate instruction for the conduct of operator training, provides adequate operations practices that control the on-shift training of facility operators, and prevents inadvertent or incorrect trainee manipulation of equipment. The procedure appropriately covers authorization and documentation of training activities and implementation of conditions for conducting training during operational activities, including suspension of training during unanticipated or abnormal events.

During interviews, two field operators, two control room operators, an STE, and a SOM demonstrated comprehensive knowledge of continuing and on-shift training, trainee control, logkeeping, and the number of trainees allowed on watch. An observed class instructor for NSBOHCHE-TPSG-0001-0001-00, *H-Canyon, Head End Operator Training*, demonstrated excellent teaching skills using computer animation to clearly illustrate the complex equipment and process flow in dissolving and processing feed stock (e.g., uranium and plutonium). The instructor's effective engagement through discussions and questioning further reinforced trainee knowledge. An observed control room operator in training appropriately adhered to protocols, ensuring that trainees manipulated controls only while under direct supervision of a qualified/certified operator/trainer evaluator, thereby mitigating operational risks.

The reviewed training plan developed by SRNS for the chemical separations process is a commendable effort, effectively addressing the significant operator qualification gap that emerged since the last chemical separations evolution performed in August 2021. Comprehensive training is proactively scheduled for field operators, control room operators, STEs, and SOMs prior to the planned simulant runs in June 2026, demonstrating a strategic commitment to readiness. This approach integrates both on-shift and on-the-job training of the workforce and provides sufficient time to ensure that operators acquire the necessary proficiency for this complex chemical separation process, thereby positioning them to successfully support operations scheduled to begin in October 2026.

On-shift Training Conclusions

SRNS's procedures and practices adequately control on-shift training of facility operators and prevent the inadvertent or incorrect trainee manipulation of equipment. Interviewed operators and managers demonstrated comprehensive knowledge of on-shift training requirements and control of trainees.

3.6 Investigation of Abnormal Events, Conditions, and Trends

This portion of the assessment evaluated SRNS's processes for investigating abnormal events, conditions, and trends.

SRNS has developed adequate procedures (Manual 2S, Procedure 5.2, *Issue Investigations*; and Manual 22Q, Procedure CA-1, *Causal Analysis*) for managing event scenes and performing event investigations in accordance with DOE Order 422.1, attachment 2, requirement 2.f. The procedures appropriately include requirements and criteria for identifying specific events that require investigation; specify training and qualification requirements for event investigators; and require causal analysis, extent-of-condition reviews, and corrective actions to prevent recurrence. Manual 2S, Procedure 5.2, appropriately requires issue investigation meetings when an issue is reportable in the DOE Occurrence Reporting and Processing System (ORPS). Reviewed event investigations, causal analyses, trend data, and operability evaluations demonstrated that SRNS is adequately implementing Manual 2S, Procedure 5.2; Manual 22Q, Procedure CA-1; and DOE Order 422.1, attachment 2, requirement 2.f.

Corrective actions resulting from events are entered into the Commitment Tracking System (CTS) within the Site Tracking, Analysis, and Reporting System (STAR) and are appropriately managed in accordance with Manual 22Q, Procedure CAP-1, *Corrective Action Program*. Procedure CAP-1 appropriately requires effectiveness reviews to be performed for all corrective actions resulting from consequential issues (including ORPS) that are categorized as significance category (SC) 1 or 2. Effectiveness reviews are appropriately tracked in CTS, with a due date that is auto-populated for 180 days following closure of the final corrective action associated with the issue. Additionally, CAP-1 appropriately requires independent verifications to be performed for all corrective actions that are identified as preventing recurrence, commitments to DOE, or addressing non-compliance tracking issues, and CTS auto-populates this required step as a corrective action to be taken. This process is considered a **Best Practice** because it ensures that actions are sufficiently addressed for closure and effectiveness is assessed in a timely manner.

While CTS is an effective tool for managing issues, one instance of an issue that was not entered into CTS was identified. The issue was associated with installed crane rail shoes that were discovered during a preventive maintenance activity to be inadequately manufactured. The crane rail shoes required machining, which corrected the issue. However, contrary to DOE Order 422.1, attachment 2, requirement 2.f, the discovered issue was not tracked in CTS to evaluate the extent of conditions. (See **Deficiency D-SRNS-1**.) Not tracking issues in CTS that could affect safety or mission hinders the evaluation of the extent of conditions and trending, thereby increasing the risk of recurrence and potential impact on mission essential operations.

SRNS has developed an adequate procedure, Manual 22Q, Procedure MRB-1, *Management Review Boards for SC 1 and SC 2 Issues*, for analyzing, evaluating, and monitoring performance data. During an observed meeting, the MRB appropriately reviewed MFOs performed over the past week, and new issues added to CTS during the same period derived from ORPS reports, self-assessments, and non-conformance reports. SRNS's lessons learned are appropriately shared and disseminated with meeting minutes to H-Area managers, with the expectation that they will communicate with workers as appropriate. Observed pre-job briefings effectively discussed lessons learned.

Reviewed minutes of monthly MRB meetings and quarterly Environmental Management (EM) operations MRB meetings demonstrated appropriate monitoring of H-Canyon trends. During the past year, the EM operations MRB effectively identified declining performance trends related to hazardous energy control and CONOPS. To address these declining trends, SRNS-RP-2025-01281 appropriately established expectations for increased management engagement in the field, with key focus areas in hazardous energy control, shift turnover, pre-job briefings, work package reviews, work release, and hands-on field work activities.

Investigation of Abnormal Events, Conditions, and Trends Conclusions

SRNS has established and implemented generally effective operations practices for investigating and reporting abnormal events, conditions, and trends. The CTS automation of due dates for effectiveness reviews and independent verifications of key corrective actions is considered a best practice. However, an issue that could affect safety or mission was corrected but was not tracked in CTS.

3.7 Notifications

This portion of the assessment evaluated SRNS's operations procedures and practices to ensure appropriate notifications and timely response to events.

Manual 2S, Procedure 2.3, *Notifications*, appropriately establishes requirements for notifications in accordance with DOE Order 422.1, attachment 2, requirement 2.g. H-Canyon control room operators demonstrated adequate availability of communications equipment for abnormal event notifications, including the PA system. The 211-H control room operator demonstrated a thorough knowledge of the notification process, including proficiency in receiving and responding to alarm conditions. Reviewed logbook entries for issues that might require a notification were sufficiently thorough in detailing occurrences during the operating shift. However, Manual 2S, Procedure 2.3, lacks clear guidance for notifying DOE-SR of sub-reportable events. (See **OFI-SRNS-1**.)

Manual 9B, *Site Item Reportability and Issue Management*, Procedure 1-0, *Occurrence Reporting*, provides generally adequate instructions for providing required and informational notifications to SRNS management, support groups, and DOE-SR, in accordance with DOE Order 422.1, attachment 2, requirement 2.g. Twelve reviewed events reported in the ORPS between January 2025 and January 2026 were appropriately categorized and communicated via internal, DOE, and external notifications. However, contrary to DOE Order 232.2A, *Occurrence Reporting and Processing of Operations Information*, attachment 1, section 3.b, the ORPS categorization timelines were not met for 7 of 12 reviewed events, resulting in delayed notifications. (See **Deficiency D-SRNS-2**.) Timely notification of key stakeholders, such as senior leadership and DOE, is needed to assess systemic weaknesses and ongoing risks to workers, the public, and the environment.

Notifications Conclusions

SRNS has developed generally adequate procedures and instructions for required and informational notifications of abnormal events to SRNS management, support groups, and DOE-SR. The availability of communications equipment for abnormal event notifications is adequate. However, weaknesses were identified associated with meeting ORPS categorization timelines and the guidance used for notifications of sub-reportable events.

3.8 Control of Equipment and System Status

This portion of the assessment evaluated SRNS's practices for the control of equipment and system status.

Manual 2S, Procedure 5.5, *Control of Equipment and System Status*, adequately addresses DOE Order 422.1, attachment 2, requirement 2.h, to establish and implement robust operational practices for equipment lineups and subsequent changes to ensure that facilities operate with known and proper configurations as designed. The procedure provides adequate instructions for comprehensive control over equipment and system status, including instructions for system alignments, administrative locking/sealing of components, verification of TSR compliance for operating mode changes, authorization for equipment

removal/restoration to service, documentation of equipment deficiencies, and use and maintenance of facility status boards.

Manual 1Y, *Conduct of Maintenance*, Procedure 8.20, *Work Control Procedure*, establishes an adequate process for repair and maintenance work, particularly for safety significant structures, systems, and components (SSCs) requiring configuration control. Reviewed work control packages consistently demonstrated appropriate configuration control. For example, work order 2083985, *Install Pressure Gauge on 294-H Sand Filter*, appropriately included commercial grade dedication of the safety significant pressure gauge and necessary design change forms, demonstrating robust configuration control practices.

Temporary modifications to configuration-controlled items are adequately managed in accordance with Manual E7, *Conduct of Engineering*, Procedure 2.06, *Temporary Modification Control*. Reviewed temporary modifications consistently demonstrated adequate configuration control.

Operations and maintenance personnel effectively coordinate with engineering personnel to maintain rigorous configuration control of system alignment. An observed SOM appropriately reviewed applicable facility documentation and informed operators and workers of the facility status. Interviews with the STE and observations of control room activities, including shift turnovers and log entries, confirmed continuous and effective awareness of facility equipment status. These interviews also confirmed that operations management understood and effectively fulfilled their responsibilities for maintaining proper configuration and authorizing status changes for major equipment.

While generally adequate control of equipment and system status was observed during walkdowns, some out-of-service equipment (i.e., an abandoned power panel and several abandoned air regulators) was energized or had active instrument air applied to the components. Contrary to DOE Order 422.1, attachment 2, requirement 2.h.(2), the out-of-service equipment was not isolated from energy and mechanical sources as required by Manual E7, Procedure 1.31, *Master Equipment List*, attachment 8.3; Manual 8Q, *Employee Safety Manual*, Procedure 121, *Out of Commission (OOC) Process*, section 5.1.1; and Manual 2S, Procedure 5.5, section 5.1. (See **Deficiency D-SRNS-3.**) Out-of-service components with active energy and/or mechanical system sources could result in worker safety issues.

Control of Equipment and System Status Conclusions

SRNS has established and implemented adequate practices for initial equipment lineups and subsequent changes to ensure that facilities operate with known and proper configurations. Personnel effectively fulfilled their responsibilities for maintaining proper configuration control. However, some observed out-of-service equipment was energized or had instrument air applied to the components.

3.9 Lockout and Tagouts

This portion of the assessment evaluated SRNS's operator practices for the installation and removal of lockouts/tagouts (LOTOs) to protect personnel, and the use of caution and lockout tags to support facility operations.

SRNS has established and implemented adequate practices for installing and removing LOTOs to protect personnel from hazardous energy sources. Manual 8Q, Procedure 32, *Hazardous Energy Control (Lockout Tagout)*, adequately addresses the processes, roles, and responsibilities associated with the development, documentation, review, installation, independent verification, and removal of a LOTO in accordance with DOE Order 422.1, attachment 2, requirement 2.i.(1); 29 CFR 1910, *Occupational Safety and Health Standards*; 29 CFR 1926, *Safety and Health Regulations for Construction*; and National Fire Protection Association 70E, *Standard for Electrical Safety in the Workplace*.

Manual 2S, Procedure 5.9, *Hazardous Energy Control*, provides adequate instructions on the use of LOTOs for controlling hazardous energy sources while Manual 8Q, Procedure 32, adequately addresses the procedures for installing and removing LOTOs to protect personnel. Manual 2S, Procedure 5.5, section 5.5, *Equipment Locking/Sealing for Administrative Control*, and Manual 8Q, Procedure 32, adequately address lockouts required to protect personnel and equipment. In addition, procedure 221-H-6082, *H-Can/OF-H Lockout/Tagout Expectations*, adequately expands on the requirements of Manual 8Q. Two observed previously installed electrical LOTOs exhibited adequate equipment locked configuration on the first level of the H-Canyon facility, with keys appropriately controlled by operations personnel in the control room.

SRNS has established and implemented adequate practices for installing and removing caution tags for equipment protection or operational control. Manual 8Q, Procedure 12, *General Site Safety Requirements*, section 5.2, is consistent with DOE Order 422.1, attachment 2, requirement 2.i.(2), for the installation and removal of caution tags. The reviewed active operations tag list shows that it is appropriately maintained and periodically audited and updated. Caution tags observed during walkdowns of the second and third levels of the H-Canyon facility were adequately installed and included pertinent safety information.

Lockout and Tagouts Conclusions

SRNS has established and implemented adequate LOTO practices that meet the requirements for controlling hazardous energy sources and protecting personnel. The observed LOTOs that were in place in the field were in compliance with established procedures. Additionally, SRNS's caution tag program is adequate to inform and alert personnel about pertinent safety information.

3.10 Independent Verification

This portion of the assessment evaluated SRNS's operations practices for implementing independent verification.

SRNS has established adequate operations practices to verify that critical equipment configuration is in accordance with controlling configuration documents (e.g., drawings and specifications). Manual 2S, Procedure 5.7, *Verification Methodologies*, adequately addresses DOE Order 422.1, attachment 2, requirement 2.j. Procedure 221-H-6043 appropriately identifies specific situations that require independent verification or second person verification. Second person verifications are appropriately authorized (instead of independent verifications) in some situations where time/distance is not feasible, such as areas having significant radiation exposure potential. However, a few examples of equipment that had been taken out of service that remained energized (see D-SRNS-3 in section 3.8) suggest that the implementation of the independent verification process may not have been adequate at that time. Further, tagging issues that are discussed in section 3.18 would have required independent verification.

Independent Verification Conclusions

SRNS has established adequate operations practices to verify that critical equipment configuration is in accordance with controlling configuration documents. However, some implementation issues were identified.

3.11 Logkeeping

This portion of the assessment evaluated SRNS's logkeeping procedures and practices, which are meant to ensure thorough, accurate, and timely recording of events and equipment information for performance analysis and trend detection.

SRNS's logkeeping procedure and practices adequately address established requirements, supporting thorough, accurate, and timely recording of events and equipment information. Manual 2S, Procedure 2.4, *Operating Logs*, effectively addresses DOE Order 422.1, attachment 2, requirement 2.k, by clearly specifying narrative log requirements for key positions. This procedure appropriately mandates prompt and accurate information recording, defines specific entry type, scope, and format, and outlines methods for handling late or erroneous entries without obscuring originals. Furthermore, the procedure includes instructions for periodic supervisory review of the logs to verify accuracy and completeness.

SRNS has implemented an adequate logkeeping procedure as demonstrated by reviewed log entries from operations personnel and STEs. The entries were legible, appropriately detailed, and adhered to proper techniques for recording late entries and correcting errors. Supervisory reviews and annotations were also adequately completed, confirming the thorough and accurate execution of established logkeeping protocols.

Logkeeping Conclusions

SRNS's logkeeping procedure and practices are adequate to support recording thorough, accurate, and timely operations logs. SRNS operations personnel adequately performed logkeeping in accordance with governing procedures.

3.12 Turnover and Assumption of Responsibilities

This portion of the assessment evaluated SRNS's operational shift and operator relief turnover processes to verify the thorough, accurate transfer of information and responsibilities at shift turnover or on-shift operator relief.

SRNS has established and implemented adequate shift and operator relief turnover processes to provide for continued safe operations in accordance with DOE Order 422.1, attachment 2, requirement 2.1. Manual 2S, section 4.1, *Shift Turnover*, adequately defines key positions and the process for the formal turnover of operations from one shift to another and from one person to another to ensure thorough understanding of equipment status and in-process or planned activities. Reviewed individual checklists for each watch station included the defined content of turnover checklists, ensuring comprehensive communication and documentation of current operations. Turnover checklists are prepared and reviewed using the electronic e-turnover tool, with hard-copy backup available. Reviewed turnover checklists appropriately included key information, such as the facility operating mode and status, status of safety equipment, operational limits in effect, limiting conditions for operations in effect (normal or abnormal), and upcoming or in-progress maintenance, testing, or evolutions. All interviewed operations personnel were familiar with the expectations for turning over ongoing activities.

An observed turnover from the day shift SOM to the night shift SOM was effectively conducted. The day shift SOM prepared a comprehensive turnover checklist that included the LOTO log, plan of the day, post-maintenance test list status, temporary modification log, and tag log. The night shift SOM appropriately reviewed these documents, asked clarifying questions, and confirmed readiness for the turnover. The day shift SOM provided an extensive overview of the facility's current status, detailing activities since the previous night shift SOM's departure. Topics discussed included limiting conditions for operation that had been entered and exited for testing, upcoming LOTO work, and the day shift's plan

for a post-maintenance run on a plant air compressor, along with the necessary conditions for morning testing. The status of a recent fire protection system impairment, including its resolution and associated compensatory measures, was clearly communicated. The work activities and shift orders were thoroughly discussed, as were any new or out-of-service alarms. Both SOMs then effectively walked down control room panels, discussing any out-of-service or abnormal indications. Upon completion of this comprehensive process, the night shift SOM confirmed readiness to relieve the day shift SOM, who then formally stated being relieved, with an entry made into the SOM log.

Turnover and Assumption of Responsibilities Conclusions

SRNS has established and implemented adequate shift and operator relief turnover processes, and demonstrated effective turnover during an observed shift change and operator relief.

3.13 Control of Interrelated Processes

This portion of the assessment evaluated SRNS's control of interrelated processes through established operating practices that support facility safety or operations.

Interrelated processes are adequately controlled through training, work scheduling, work release, and memoranda of understanding. Manual 2S, Procedure 5.14, *Control of Interrelated Process*, establishes an adequate framework and roles and responsibilities for control of interrelated processes in accordance with DOE Order 422.1, attachment 2, requirement 2.m. Operations personnel receive adequate training on interrelated processes in class NSBOHCEV-STGD-0001-04, *Waste Operator Study Guide*. To minimize potential system impacts, work is appropriately scheduled in accordance with Manual 1Y, Procedure 8.20. There are several memoranda of understanding with organizations outside of H-Canyon that ensure continuity of operations.

Observed work was properly scheduled and released by the SOM in accordance with the plan of the day. Operators appropriately followed procedures. Interviews with an STE, a SOM, and operators demonstrated clear understanding of facility operations and system interdependencies. All interviewed personnel understood the appropriate actions to take if a procedure could not be followed as written.

Control of Interrelated Processes Conclusions

SRNS has established and implemented adequate operating practices for the control of interrelated processes.

3.14 Required Reading

This portion of the assessment evaluated SRNS's required reading program to verify that operators are updated on important information.

Manual 2S, Procedure 3.1, *Required Reading*, adequately addresses required reading in accordance with DOE Order 422.1, attachment 2, requirement 2.n. The procedure appropriately requires SRNS to identify the material to be distributed via required reading, the individuals who are required to read distributed material, and the documentation of proper distribution and timely completion. Reviewed required reading status reports and sampled training packages included adequate documentation of distribution and completion status. Assigned required reading completions are appropriately tracked, and reviewed periodic reports confirmed compliance.

Required Reading Conclusions

SRNS has established and implemented an adequate required reading program to ensure that assigned operators and workers are properly updated on important information.

3.15 Timely Instructions/Orders

This portion of the assessment evaluated SRNS's practices for timely written direction and guidance from management to operators.

Manual 2S, Procedure 4.5, in general, adequately addresses DOE Order 422.1, attachment 2, requirement 2.o, including appropriate circumstances for the use of timely instructions and orders; designated levels of review and approval prior to issuance; configuration control; distribution to appropriate personnel; and documentation of their receipt and understanding. SRNS appropriately issues standing orders for longer-term communications and shift instructions (both daily and intermittent) for short-term communications. Reviewed shift orders and shift instructions demonstrated adherence to Manual 2S, Procedure 4.5. Also, reviewed active standing orders were appropriately included in the production operations shift manager turnover checklist.

A reviewed standing order was issued in response to the identification of material at risk (MAR) in solvent tanks that were not previously analyzed or credited as containing MAR. Upon discovery of the unexpected MAR, SRNS conservatively placed administrative holds on transfers to the affected tanks, suspended the associated transfer procedure, installed administrative seals, and issued a standing order establishing compensatory measures. These actions demonstrated appropriate management response and effective use of the timely order process to address emergent conditions. However, certain compensatory measures established within the standing order, specifically those associated with the combustible loading limits, were not incorporated into formal implementing procedures or periodic verification mechanisms (e.g., surveillance requirements using round sheets) to ensure continued compliance. While the standing order was properly issued and controlled, reliance solely on administrative direction without procedural integration reduces the ability to formally verify sustained adherence to established limits. (See OFI-SRNS-2.)

Timely Instructions/Orders Conclusions

SRNS provides generally adequate timely written direction and guidance for management to operators. The timely instructions and orders process is formally established and was appropriately used in response to emergent conditions. However, certain compensatory measures established within a reviewed standing order were not incorporated into formal implementing procedures.

3.16 Technical Procedures

This portion of the assessment evaluated SRNS's practices for developing and maintaining accurate, understandable written technical procedures.

SRNS has established and implemented adequate operations practices for developing and maintaining accurate, understandable written technical procedures in accordance with DOE Order 422.1, attachment 2, requirement 2.p. Manual 2S, section 1.1, *Procedure Administration*, and section 1.3, *Procedure Compliance*, adequately establish the basis for procedure compliance expectations, procedure owner responsibilities, the procedure change process, and the interim procedure change process. Procedure PS-TS-AP-4005, *Procedural Document Structure*, is the governing document for procedure structure and

format. Some expectations for procedure use are further clarified in procedure 221-H-6043 for specific H-Canyon operational activities.

Field operators, control room operators, and SOMs demonstrated a good understanding of procedure use, validation, and deviation protocols. Personnel understand and can execute timely interim procedure changes, even during off-hours, as evidenced by reviewed examples. On-shift personnel explained that they have direct access to procedure files and can effectively update them in real time. Manual “pen and ink” corrections are rare, indicating a preference for comprehensive interim changes. A field operator explained that the entire procedure is updated during interim changes, which minimizes human error associated with page-specific changes.

An observed installation of a calibrated universal digital ratemeter was effectively performed using procedure H-782054 as part of work order 02205337, task 01. The pre-job briefing of this work activity, which was a continuation from the day prior, was thorough and appropriately included a discussion of “what could go wrong.” During the observed work activity, the electrical and instrumentation mechanic directed the work activities, and radiological protection staff and an independent Quality Assurance inspector were present to perform activities as instructed in the procedure and as required by associated work control documentation.

An observed post-maintenance test for the plant air compressor using procedure 221-H-7994, *Start-Stop Plant Air Compressor*, demonstrated effective worker safety and procedural adherence. The FLM conducted a comprehensive job brief, ensuring that necessary personnel were present, reviewing repair history, discussing past startup attempts, and going through a pre-job checklist (e.g., personal protective equipment, hazards, human performance tools). The FLM also conducted a “reverse brief,” where each team member described their assigned task, ensuring that all participants were familiar with the procedural instructions. During the evolution, operators appropriately followed the procedure to complete the lineup for starting the air compressor. When the compressor failed to start, operators followed the procedure to return the compressor to a LOTO condition pending further troubleshooting to confirm the root cause of the failure.

Technical Procedures Conclusions

SRNS has established and implemented adequate operations practices for developing and maintaining accurate, understandable written technical procedures. Operators and operations staff have a thorough understanding of procedure use, compliance, and the procedure change process.

3.17 Operator Aids

This portion of the assessment evaluated SRNS’s practices for managing and using operator aids.

SRNS has established and implemented an adequate process for providing accurate, current, and approved operator aids. Manual 2S, Procedure 5.10, *Operator Aid Postings*, adequately addresses DOE Order 422.1, attachment 2, requirement 2.q, with instructions for developing and implementing accurate, current, and approved operator aids. Observed operator aids showed evidence of management approval. Additionally, observed operator aids did not obscure equipment, were administratively controlled, and were periodically reviewed for adequacy, continued utility, and correctness. Interviewed personnel were appropriately aware of the requirements for operator aids.

Operator Aids Conclusions

SRNS has established and implemented an adequate process for providing accurate, current, and approved operator aids.

3.18 Component Labeling

This portion of the assessment evaluated SRNS's practices for clear, accurate equipment labeling.

SRNS has established and implemented a generally adequate process for equipment labeling. Manual 2S, Procedure 5.11, *Equipment and Piping Labeling*, adequately establishes a component labeling program in accordance with DOE Order 422.1, attachment 2, requirement 2.r. Manual E7, Procedure 1.30, *Component and Equipment Numbering*, appropriately requires that labels include a unique component location identifier (CLI). Standardized label format and colors are described in Manual E7, Procedure 1.32, *Labeling of Configuration Controlled Structures, Systems, and Components*. Facility-specific expectations for the installation of temporary and permanent labels are adequately addressed in procedure 221-H-6043. However, a recently completed configuration management self-assessment, 2025-SA-003013, *FA-09 Design Requirements – Element 9.2*, identified gaps in the equipment labeling and associated documentation of three configuration-controlled SSCs (circulated cooling water monitor system, vessel air purge system, and the nuclear incident monitor alarm system). Equipment labels did not always match the CLI information contained on system drawings or in the design drawing database. The self-assessment was appropriately reviewed by the H-Area MRB, and corrective actions are being developed and tracked in CTS under issue number 2026-CTS-001086.

Interviewed SOMs and operators were aware of their roles and responsibilities for component labeling. Observations of accessible facility SSC areas generally confirmed that valves, instruments, and piping exhibited labels that were properly applied, were durable, and contained the required information, enabling facility personnel to accurately identify equipment. However, during a walkdown of the process air system with the Design Authority, three equipment components were identified that had temporary labels installed more than 18 months prior, including a pressure relief valve. The temporary labels were not being tracked in the database to ensure permanent label replacement, as the placement of the temporary labels predated the rollout of a new labeling database. Upon discovery, the H-Canyon labeling coordinator took immediate actions to order permanent labels. Additionally, during a walkdown of equipment condition, various components were noted as being out of service but not appropriately labeled. (See **OFI-SRNS-3**.) Examples include transmitters, switches, power panel, and air regulators on level two of the facility and breakers on level one of the facility.

Component Labeling Conclusions

SRNS has established and implemented a generally adequate process for equipment labeling. Observed valves, instruments, and piping generally exhibited appropriate labels. However, some out-of-service components were not appropriately labeled.

3.19 Federal Oversight

This portion of the assessment evaluated the adequacy of DOE-SR's oversight of SRNS's CONOPS program implementation, including program oversight and oversight of field activities.

DOE-SR has established an adequate oversight framework that includes assessment planning, field observations, document reviews, and engagement with contractor management through an oversight program established in Implementing Procedure SRIP 421.1, *Nuclear Safety Oversight*, and consistent with

DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*. Despite reduced Facility Representative staffing levels, Federal oversight personnel completed approximately 80% of 79 planned assessments during fiscal year 2025, which identified issues and informed contractor corrective actions, demonstrating continued commitment to maintaining oversight of H-Canyon facilities under constrained resources. Federal staff maintained routine field presence and actively engaged with contractor personnel to monitor operational performance and program implementation.

Federal oversight personnel demonstrated a questioning attitude and maintained awareness of facility conditions by requesting and reviewing standing orders, shift instructions, trending data, and MRB outputs. Oversight personnel also raised questions regarding procedural discipline and notification practices, reflecting attentiveness to emerging CONOPS vulnerabilities. Discussions with Federal staff demonstrated sustained engagement in evaluating contractor corrective actions and performance trends. However, reduced staffing limits the depth and frequency of oversight activities in certain areas. While Federal personnel continue to identify and elevate CONOPS concerns, the ability to perform in-depth evaluations and maintain comprehensive facility coverage is challenged by current resource constraints.

Federal Oversight Conclusions

DOE-SR has established an adequate oversight framework that demonstrates continued commitment to maintaining oversight of H-Canyon facilities under constrained resources. Federal staff maintained routine field presence and actively engaged with contractor personnel to monitor operational performance and program implementation. However, reduced staffing limits the depth and frequency of oversight activities.

4.0 BEST PRACTICES

Best practices are safety-related practices, techniques, processes, or program attributes observed during an assessment that may merit consideration by other DOE and contractor organizations for implementation. The following best practices were identified as part of this assessment:

- The SRNS apprenticeship program provides robust initial training to apprentices in important topics, such as CONOPS, hazardous energy control, and facility-specific training, and effectively prepares them for the initial qualification process.
- When effectiveness reviews are required, CTS automatically generates their due date upon closure of the final corrective action associated with the issue. Additionally, independent verifications are required for closure of corrective actions that are identified in CTS to prevent recurrence.

5.0 FINDINGS

No findings were identified during this assessment.

6.0 DEFICIENCIES

Deficiencies are inadequacies in the implementation of an applicable requirement or standard. Deficiencies that did not meet the criteria for findings are listed below, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

Savannah River Nuclear Solutions, LLC

Deficiency D-SRNS-1: SRNS did not enter an issue into CTS associated with installed crane rail shoes, which were discovered to be inadequately manufactured during a preventive maintenance activity. (DOE Order 422.1, att. 2, requirement 2.f)

Deficiency D-SRNS-2: SRNS did not categorize 7 of 12 reviewed ORPS events within the required timelines, resulting in delayed notifications. (DOE Order 232.2A, att. 1, sec. 3.b)

Deficiency D-SRNS-3: SRNS does not ensure that all out-of-service equipment is isolated from energy and mechanical sources. (DOE Order 422.1, att. 2, requirement 2.h.(2); Manual E7, Procedure 1.31, att. 8.3; Manual 8Q, Procedure 121, sec. 5.1.1; and Manual 2S, Procedure 5.5, sec. 5.1)

7.0 OPPORTUNITIES FOR IMPROVEMENT

EA identified the OFIs shown below to assist cognizant managers in improving programs and operations. While OFIs may identify potential solutions to findings and deficiencies identified in assessment reports, they may also address other conditions observed during the assessment process. These OFIs are offered only as recommendations for line management consideration; they do not require formal resolution by management through a corrective action process and are not intended to be prescriptive or mandatory. Rather, they are suggestions that may assist site management in implementing best practices or provide potential solutions to issues identified during the assessment.

Savannah River Nuclear Solutions, LLC

OFI-SRNS-1: Consider establishing clear expectations for notifications of sub-reportable events between H-Canyon staff and DOE Facility Representatives.

OFI-SRNS-2: Consider incorporating compensatory measures established through standing orders – particularly those associated with safety basis implications, such as combustible loading limits – into formal implementing procedures or surveillance mechanisms to ensure sustained compliance and periodic verification.

OFI-SRNS-3: Consider performing an extent-of-condition review to look for temporary labels that pre-date the new labeling database, ensuring that these labels are being tracked for permanent label replacement in the new system and that out-of-service components are appropriately identified and labeled.

Appendix A Supplemental Information

Dates of Assessment

January 5 to February 11, 2026

Office of Enterprise Assessments (EA) Management

Mark D. Barth, Acting Director, Office of Enterprise Assessments
Eric A. Ruesch, Acting Director, Office of Environment, Safety and Health Assessments
Tamara D. Powell, Director, Office of Nuclear Safety and Environmental Assessments
David Olah, Director, Office of Worker Safety and Health Assessments
Wade W. Gough, Acting Director, Office of Emergency Management Assessments
Brent L. Jones, Director, Office of Nuclear Engineering and Safety Basis Assessments

Quality Review Board

William F. West, Advisor
Kevin G. Kilp, Chair
Scott F. Wenzholz
John S. Boulden III
William A. Eckroade

EA Site Lead for Savannah River Site

Samina A. Shaikh

EA Assessment Team

Samina A. Shaikh, Lead
Elizabeth F. Dunn
John J. Golyski
Michael D. Love
James G. Poorbaugh