Office of Enterprise Assessments
Assessment of the
Savannah River Site
Salt Waste Processing Facility Safety Basis

January 2019

Office of Nuclear Safety and Environmental Assessments
Office of Environment, Safety and Health Assessments
Office of Enterprise Assessments
U.S. Department of Energy

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Acronyms

AA	Accident Analysis
ASP	Alpha Strike Process
CFR	Code of Federal Regulations
Cs-137	Cesium-137
Curies	Ci
DBA	Design Basis Accident
DiD	Defense in Depth
DOE	U.S. Department of Energy
DOE-SR	DOE Savannah River Operations Office
DSA	Documented Safety Analysis
DWPF	Defense Waste Processing Facility
EA	Office of Enterprise Assessments
EG	Evaluation Guideline
HA	Hazard Analysis
HC	Hazard Category
LCO	Limiting Condition for Operation
MST	Monosodium Titanate
SAC	Specific Administrative Control
SBRT	Safety Basis Review Team
SER	Safety Evaluation Report
SIL	Safety Integrity Level
SMP	Safety Management Program
SR	Surveillance Requirement
Sr-90	Strontium-90
SRS	Savannah River Site
SS	Safety Significant
SSC	Structure, System, and Component
SWPF	Salt Waste Processing Facility
TOC	Threshold of Concern
TSR	Technical Safety Requirements Document
TSRs	Technical Safety Requirements

Office of Enterprise Assessments
Assessment of the Savannah River Site
Salt Waste Processing Facility Safety Basis

EXECUTIVE SUMMARY

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 documented safety analysis (DSA), technical safety requirements document (TSR), and safety evaluation report (SER) for the Savannah River Site Salt Waste Processing Facility (SWPF). This assessment, conducted from September 2017 through October 2018, is part of a series of targeted safety basis assessments of nuclear facility design and construction projects at certain DOE sites.

The assessment evaluated the conformance of the SWPF DSA, TSR, and SER to the requirements of DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, Change Notice 3, and DOE-STD-1104-2016, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*, for the development, review, and approval of safety basis documents. The assessment encompassed specific aspects of the DSA, TSR, SER, supporting hazard analysis, and supporting engineering documents. EA also examined the safety functions, functional classifications, functional requirements, performance criteria, and TSR controls for certain safety structures, systems, and components (SSCs) and specific administrative controls.

The DSA conforms to the requirements of DOE-STD-3009-94 and adequately supports the future operation of SWPF as sampled by this assessment. The comprehensive site and general information, hazard identification and screening, and process descriptions support a thorough hazard evaluation. The hazard evaluation includes an appropriately detailed, conservative set of events and provides a sound basis for control selection and functional classification of safety significant SSCs. The DSA appropriately identifies safety significant controls for the protection of workers and the public. The selected hazard controls adequately address the identified hazards. The safety functions and functional requirements for the controls are generally appropriate and adequately evaluated. The TSR is sufficient to ensure that SSCs and specific administrative controls meet their safety functions and functional requirements. During this assessment, EA provided comments on the draft versions of the DSA and TSR. The Parsons Corporation SWPF safety basis team reviewed and responded to the comments, and all EA comments were satisfactorily resolved in the final transmittal of the DSA and TSR.

The DOE Savannah River Operations Office SWPF Safety Basis Review Team, which included appropriate subject matter experts, documented its review of the DSA and TSR in an SER. The SER adequately addresses the DOE-STD-1104-2016 approval bases, and appropriately concludes that there is reasonable assurance of adequate protection of workers, the public, and the environment from adverse consequences, considering the work to be performed and the associated hazards.

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1.0 PURPOSE

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 documented safety analysis (DSA), technical safety requirements document (TSR), and safety evaluation report (SER) for the Savannah River Site (SRS) Salt Waste Processing Facility (SWPF). The assessment evaluated specific aspects of the SWPF DSA, TSR, SER, and supporting documentation. This assessment, conducted from September 2017 through October 2018, is part of a series of targeted safety basis assessments of nuclear facility design and construction projects at certain DOE sites.

2.0 SCOPE

This assessment covered the development and approval of the SWPF safety basis, which includes the DSA and TSR, and was performed in accordance with EA's *Plan for the Office of Enterprise Assessments Assessment of the Salt Waste Processing Facility Safety Basis at the Savannah River Site, September 2017*. The assessment encompassed review of supporting documents, including the hazard analysis (HA), engineering calculations, reports, studies, and drawings. The assessment focused on safety controls that are required to prevent (or reduce the frequency of) or mitigate the consequences of the higher-risk postulated events. The assessment also included review of the SER, which documents DOE Savannah River Operations Office's (DOE-SR's) approval of the DSA and TSR.

3.0 BACKGROUND

SWPF is an important nuclear waste treatment facility being commissioned at SRS. The SWPF mission is to pre-treat the salt waste solutions removed from the liquid waste tanks in the F- and H-Area Tank Farms. Pre-treatment at SWPF removes and concentrates certain actinides (i.e., elements with an atomic number between 89 and 103), strontium-90 (Sr-90), and the soluble, highly radioactive cesium-137 (Cs-137) from the salt solution feed. Three main pre-treatment processes are used in SWPF. The Alpha Strike Process (ASP) sorbs certain actinides and Sr-90 on monosodium titanate (MST) and concentrates the MST and sorbed radionuclides by filtration. The second process, Caustic-Side Solvent Extraction, extracts Cs-137 from the aqueous ASP effluent into a reusable organic extractant. The concentrated Cs-137 is then stripped from the extractant into a disposable aqueous solution. The third process, the Alpha Finishing Process, is similar to ASP in that MST is used to sorb specific actinides and Sr-90. The concentrated waste containing actinides, Sr-90, and Cs-137 constituents is sent to the Defense Waste Processing Facility (DWPF), where the waste will be immobilized in glass through a vitrification process. The decontaminated salt solution is sent to the Saltstone Production Facility for immobilization in a grout mixture and disposal in grout vaults.

Parsons Corporation (subsequently referred to as Parsons) is the current operator of SWPF and developed the safety basis documents for SWPF to support a scheduled startup in calendar year 2019. The Parsons Nuclear Safety Manager is responsible for the development of the safety basis documents. DOE-SR is responsible for independent review and approval of the SWPF safety basis. The DOE-SR Deputy Manager is the Safety Basis Approval Authority. The Parsons SWPF safety basis team is responsible for implementing the requirements and processes established in DOE-STD-3009-94, *Preparation Guide for*

U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses, Change Notice 3, for the development, review, and approval of the facility's safety basis. The DSA, TSR, and SER collectively comprise the SWPF safety basis.

4.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*. EA implements the independent oversight program through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. Organizations and programs within DOE use varying terms to document specific assessment results. In this report, EA uses the terms "deficiencies," "findings," and "opportunities for improvement" consistent with DOE Order 227.1A. In accordance with this order, DOE line management and/or contractor organizations must develop and implement corrective action plans for any deficiencies identified as findings.

As identified in the approved EA plan, this assessment considered requirements for the SWPF safety basis documents from Title 10 CFR Part 830, *Nuclear Safety Management*; DOE-STD-3009-94; and DOE-STD-1104-2016, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*. Moreover, EA selected objectives and criteria from EA Criteria and Review Approach Document 31-07, *New Nuclear Facility Documented Safety Analysis and Technical Safety Requirements Criteria Review and Approach Document*, to guide its assessment of the DSA, TSR, and SER.

EA independent oversight assessments focus strategically on aspects of nuclear safety essential to ensuring effective protection of workers and the public. By performing a vertical slice sampling review of selected aspects of the DSA, TSR, and supporting HA, the assessment indirectly addressed the line management preparation, review, and approval processes. EA examined key supporting documents, such as the HA, accident analysis (AA) calculations, design calculations, piping and instrumentation diagrams, analytical limit calculations, and safety integrity level (SIL) determination engineering study and verification calculations. EA also conducted meetings with Parsons and DOE-SR Safety Basis Review Team (SBRT) personnel responsible for developing and reviewing the safety basis documents. Appendix A lists the members of the EA assessment team, the Quality Review Board, and EA management responsible for this assessment. Appendix B provides a list of the primary documents reviewed and personnel interviewed during this assessment.

EA uses a comment and response process to address issues identified during its review. EA provided comments on the DSA and TSR to DOE-SR and Parsons at various points during the document development process, and received written responses. EA did not identify any comments in the SER. When necessary, follow-on discussions between EA, DOE-SR, and Parsons were conducted to resolve issues. Comments were resolved by either adequate comment responses or by changes incorporated into the DSA, TSR, and supporting documents.

5.0 RESULTS

This section presents the results of EA's assessment of the SWPF DSA, TSR, and SER.

5.1 Documented Safety Analysis

Criterion:

In establishing the safety basis for a hazard category (HC) 1, 2, or 3 DOE nuclear facility, the contractor responsible for the facility must: (1) define the scope of the work to be performed; (2) identify and analyze the hazards associated with the work; (3) categorize the facility consistent with DOE–STD–1027–92; (4) prepare a DSA for the facility; and (5) establish the hazard controls upon which the contractor will rely to ensure adequate protection of workers, the public, and the environment. (10 CFR 830 Section 830.202.b)

5.1.1 Hazard and Accident Analyses (Chapter 3)

EA reviewed the AA in Chapter 3 of the DSA and supporting documents, such as the HA, to evaluate the proper identification of hazard controls. The final HC of SWPF is HC-2 (potential for significant on-site radiological consequences) based on the estimated Cs-137 inventory of 2.69 million Curies (Ci), compared to the HC-2 threshold of 89,000 Ci in DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*. Additionally, the plutonium-238 inventory is 3,531 Ci, compared to the DOE-STD-1027-92 HC-2 threshold of 62 Ci. Although the postulated accident scenarios did not show radiological consequences exceeding the offsite evaluation guideline (EG) for the public, there were scenarios that challenged the threshold of concern (TOC) for onsite workers, which warranted safety significant (SS) controls. The nuclear criticality SERs demonstrate that SWPF processes will remain subcritical for normal and credible abnormal conditions. EA determined that the SWPF hazard categorization is appropriate per DOE-STD-1027-92.

5.1.1.1 Hazard Identification

The hazard identification methodology documented in the HA provides a systematic approach to identifying and evaluating hazards and analyzing control strategies to mitigate and prevent the associated risks of the defined hazards of the process. Hazard identification was comprehensive, and hazards for all processes were systematically evaluated. A standard industrial hazard screening was conducted to eliminate further consideration of common hazards encountered in general industry and construction. Unmitigated consequences from a variety of hazards were considered, and only the highest consequence events were carried further in the hazard evaluation. The DSA adequately identifies and categorizes the hazards associated with the SWPF processes.

5.1.1.2 Hazard Evaluation

EA reviewed the HA and AA to determine whether they appropriately evaluated SWPF processes under normal, abnormal, and upset conditions. EA examined the analyzed hazard scenarios and potential effects of postulated events to verify that the estimated unmitigated consequences for workers and the public are appropriately conservative.

The HA methodology divided the SWPF facility into a series of discrete segments (referred to as “nodes”) in support of a systematic hazard identification and evaluation process, in order to derive the appropriate controls. More complex systems were subdivided into multiple sub-nodes. This approach used for the HA helped to define the boundaries and interfaces within SWPF, and established the applicable material at risk. The hazard evaluation analyzes normal operations and maintenance processes, as well as abnormal and accident conditions. The evaluation includes natural phenomena hazards (i.e., seismic, lightning, tornado, high wind, flooding events, and wildfire) and man-made external events (e.g., aircraft crash, external fires, and vehicle fires). The HA used a What-if/Checklist technique to identify and evaluate the hazard events. The HA concludes with a limited set of events to be considered as design basis accidents (DBAs), which are further evaluated in the AA.

The AA evaluates five DBAs identified as unique and representative accidents for SWPF: Process Vessel Cell Fire, ASP Vessel Explosion, Alpha Finishing Process Vessel Explosion, ASP Air Pulse Agitator Air Jet Aerosolization, and Seismic Event. The AA formally analyzed these events by using the appropriate AA techniques to determine the unmitigated consequences to both the public and onsite workers. The AA did not identify any postulated accidents with consequences that challenge the 25-rem EG for the maximally exposed offsite individual outside the SRS boundary. Additionally, the AA did not identify any non-radiological hazardous material accidents that cause or exacerbate a release of radioactive material or challenge the offsite chemical EG. Because no postulated accidents challenge the offsite EGs, the DSA contains an analysis of appropriate DBAs that might challenge the TOC for onsite workers, meeting the intent of analyzing unique and representative facility accidents. EA reviewed the DBAs analyzed for other similar facilities at SRS, including the Concentration, Storage, and Transfer Facilities and the DWPF, to ensure that all applicable DBA events at these similar facilities were considered in the SWPF DSA. This assessment did not identify any additional DBA events from these two DSAs warranting further evaluation.

Likelihood estimates for the analyzed events are consistent with the frequency bins identified in DOE-STD-3009-94, and the assigned initiating event frequencies are sufficiently conservative. The HA and AA evaluate an appropriate range of hazardous materials and energy sources and postulate an adequate set of hazard events. Consequences are properly estimated and, in conjunction with assigned frequencies, are appropriately analyzed for the purpose of selecting necessary controls for the safe operation of SWPF.

5.1.1.3 Hazard Controls

EA reviewed the hazard events identified in the HA and AA to evaluate the derivation and functional classification of hazard controls. The DSA follows the DOE-STD-3009-94 hierarchy of controls philosophy. Following standard practice, the DSA uses a qualitative approach to derive the controls needed to prevent or mitigate a potential accident scenario. For the analyzed accident scenarios, preventive controls are assigned for frequency reductions, and mitigative controls are assigned for consequence reductions. The resultant controls appropriately protect the public and onsite workers based on assessment of the consequences. EA determined that the control strategies are adequate to reasonably ensure the safety of workers and the public and includes a clear identification of risk.

There were no safety class controls identified in the DSA because radiological consequences to the public are demonstrated to not challenge the EG. The DSA identified SS controls as necessary to prevent or mitigate accidents exceeding the TOC for onsite workers. The AA determined that the maximum potential unmitigated radiological consequences to the public from the worst-case event, which is an explosion in the ASP Process Vessel, was 6.4 rem. The AA also determined that the unmitigated radiological consequences to an onsite worker from each of the five DBAs exceeded the TOC of 100 rem, and thus SS controls were warranted to protect the onsite workers.

The DSA properly identified an assortment of hazard controls necessary to eliminate, limit, and mitigate hazards to workers, the public, and the environment from routine operation of SWPF. The supporting calculations for the AA are adequately conservative to conclude that SWPF hazards do not challenge the offsite EG. The SS controls identified in the DSA are sufficiently defined to meet the hazard control requirements derived in the HA. Adequate controls are established at SWPF to prevent and/or mitigate identified hazard event frequencies and consequences.

5.1.1.4 Defense in Depth

The DSA effectively incorporates the principles of defense in depth (DiD) described in DOE-STD-3009-94. Functionally independent safety controls provide multiple layers of protection for workers and the public. DiD controls were selected from the assortment of controls identified in the HA that were not credited as mitigators for accident scenarios. Both engineered controls and administrative controls have been identified as DiD controls. The TSR contains requirements for safety controls that provide significant DiD. Additionally, important elements of safety management programs (SMPs), which are identified in the TSR, include specific commitments to support important DiD features and protect workers.

5.1.2 Safety Structures, Systems, and Components (Chapter 4)

EA reviewed the DSA to verify that the functional classification of certain SS structures, systems, and components (SSCs) is appropriate and to assess whether the safety functions, functional requirements, and performance criteria are adequate. The DSA clearly identifies the safety functions for credited SSCs and provides the criteria and evaluation to demonstrate that the SSCs can perform the safety functions to prevent or mitigate the identified hazards. Chapter 4 of the DSA describes attributes of the controls required to support the safety functions identified in the HA and AA and to support subsequent derivation of the technical safety requirements (TSRs). The SWPF control strategy makes use of both passive design features and active SSCs identified as SS for the protection of onsite workers. From the AA, the DSA identified a set of 30 SS SSCs and 13 SACs that are necessary to protect the public, provide DiD, and contribute to worker safety.

EA reviewed a sample of six SS SSCs to confirm that the credited controls are designed to the applicable codes and standards and when properly maintained will perform their intended safety function. One particular SS SSC of interest was the process vessel overflow lines. The purpose of the overflow lines is to contain and direct any excess radioactive material to a central location if a process vessel overfills. In order to ensure that the designed air flow through the process vessel is maintained, the overflow lines contain a liquid seal at its outlet. EA provided a comment that there could be a situation where the liquid seal in one of the overflow lines is lost, potentially impacting the ventilation flow inside the process vessel and leading to accumulation of flammable gases. Parsons subsequently provided an analysis of the potential effects from an overflow line becoming unsealed and determined that the ventilation system would continue to perform its safety function or that the SS low vacuum alarm would alert operators to initiate the required action. EA and DOE-SR found the resolution of this issue to be satisfactory.

For the SS SSCs reviewed, the safety functions, functional requirements, and performance criteria are clearly described in the DSA and support the conclusion that the selected controls effectively prevent or mitigate corresponding hazard events. The functional requirements adequately address the hazards, and the system evaluations adequately assess control performance. The safety functions are consistent with those identified in the HA and AA. Functional requirements and performance criteria are defined such that, when met, they ensure that the safety functions can be performed when needed.

5.1.3 Specific Administrative Controls (Chapter 4)

DSA Chapter 4 identifies SACs for the protection of workers and the public. Examples of SACs include the Waste Acceptance Criteria Program, Tank Agitation Program, Access Control Program, and Process Chemistry Control Program. For each SAC, the DSA provides its safety function, a description, and the functional requirements. The DSA includes an evaluation section that assesses the ability of the SAC to meet the safety functions. The safety functions are consistent with those identified in the HA and AA.

The safety functions, functional requirements, and SAC evaluations sufficiently justify how the SACs meet those requirements.

5.1.4 Documented Safety Analysis Conclusion

In summary, the DSA meets the requirements of DOE-STD-3009-94 and comprehensively identifies and evaluates the hazards associated with SWPF and its processes. The HA appropriately addresses hazardous materials and energy sources and postulates an adequate set of hazard events. The SS SSCs identified in the AA adequately ensure the safety of workers and the public. The safety functions and functional requirements in DSA Chapter 4 for SSCs and SACs are sufficiently defined, meeting the hazard control requirements of the HA and AA. The evaluation of the SSCs and SACs identifies sufficient performance criteria to ensure that safety functions will be met.

5.2 Technical Safety Requirements and their Derivation (TSR and DSA Chapter 5)

Criteria:

A contractor responsible for an HC 1, 2, or 3 DOE nuclear facility must: (1) develop TSRs that are derived from the DSA; and (2) obtain DOE approval of TSRs and any change to TSRs. (10 CFR 830, Section 830.205(a)(1)&(2))

TSRs establish limits, controls, and related actions necessary for the safe operation of a nuclear facility. (10 CFR 830, Appendix A, Section G.4)

EA reviewed selected TSRs and their associated derivation in Chapter 5 of the DSA to verify the accurate translation of the SSC and SAC performance requirements into a set of formal, implementable operational requirements that preserve and maintain the identified safety functions, functional requirements, and performance criteria from Chapters 3 and 4 of the DSA. The sampled TSRs included limiting conditions for operation (LCOs) for SSCs and SACs, SMP key elements, and design features. EA focused on controls required to prevent or mitigate the consequences associated with the higher risk events. EA also reviewed the general use and application requirements for the LCOs and surveillance requirements (SRs).

Chapter 5 of the DSA appropriately describes operating modes and derives TSRs for credited controls. LCOs are appropriately derived for SSCs and SACs. Important attributes of design features are described, including inspection and testing requirements. Minimum staffing levels and key elements of SMPs are identified. The coordination of processes with interrelated facilities (e.g., the Concentration, Storage, and Transfer Facilities, Saltstone and DWPF) is adequately described. Chapter 5 provides sufficient information on developing TSRs and is consistent with the information in Chapters 3 and 4.

EA reviewed TSR LCOs, SACs, and design features. LCOs and their bases were reviewed for content, operability statements, completion times, SRs and surveillance frequencies, and action statements. The reviewed TSRs accurately reflect their derivation in Chapter 5 of the DSA, and the content conforms to DOE Guide 423.1-1A, *Implementation Guide for Use in Developing Technical Safety Requirements*. The TSRs accurately describe the operating modes from Chapter 5, and the LCOs and SRs sufficiently ensure safe operation of SWPF. The design features section of the TSR adequately describes and identifies relevant features of SWPF that are not specifically required to have safety limits, limiting control settings, or LCOs. The bases of the reviewed LCOs are accurate and consistent with the DSA.

EA identified a widespread issue in the draft TSRs where the hardware components supporting SS interlocks (for the purpose of stopping processes with unexpected conditions) did not have SRs designating testing or replacement intervals as required by 10 CFR 830. For example, the turbidity monitoring system sends a signal to the control system stopping the flow of material when unintended particulate material is detected. The TSRs specify an annual calibration SR for this instrument, but the instrument is not required to be replaced at any specified interval. The SIL analysis for this instrument specifies that the turbidity monitors are to be replaced annually with a factory-provided setup per the manufacturer's guidelines. The initial response from Parsons on this issue was that replacement of hardware due to service lifetime issues is typically outside the scope of SRs, as stated in DOE Guide 423.1-1A. However, upon further discussion with EA, Parsons agreed to revise the DSA to capture the replacement schedule for hardware components supporting SS interlocks. Parsons revised the DSA to reference interoffice correspondence document #00-700-26801, *Conditions to Validate SS Instrument Calculations (SIL and Instrument Loop Calculations)*, which provides a consolidated list of actions required to validate the SS instrument calculations, including replacement of the turbidity monitor. Parsons is committed to tracking the completion of these action items in its maintenance and engineering programs. EA and DOE-SR found the resolution of this issue to be satisfactory.

5.3 Safety Evaluation Report

Criteria:

DOE will review each DSA to determine whether the rigor and detail of the DSA are appropriate for the complexity and hazards expected at the nuclear facility. In particular, DOE will evaluate the DSA by considering the extent to which the DSA (1) satisfies the provisions of the methodology used to prepare the DSA and (2) adequately addresses the criteria set forth in 10 CFR 830.204(b). DOE will prepare a SER to document the results of its review of the DSA. A DSA must contain any conditions or changes required by DOE. (10 CFR 830, Appendix A, Section F.3)

DOE will examine and approve the TSRs as part of preparing the SER and reviewing updates to the safety basis. (10 CFR 830, Appendix A, Section G.5)

EA reviewed the SER to determine its adequacy as the approval basis for the DSA, as required by DOE-STD-1104-2016.

The DOE-SR SBRT included members with appropriate subject matter expertise in nuclear safety, criticality safety, fire protection, systems engineering, and operations. The SBRT concluded that the safety basis has been developed in a manner that reasonably ensures adequate protection of workers, the public, and the environment from adverse consequences, taking into account the work to be performed and the associated hazards; the DSA meets the format and content requirements of DOE-STD-3009-94; and the final submittal of the DSA adequately resolves EA and SBRT comments. Based on its review, the SBRT recommended that the SWPF DSA and TSR be approved.

The SER addresses the approval bases identified in DOE-STD-1104-2016, including base information, the HA and AA, DiD, SSCs, SACs, derivation of TSRs, and SMPs. For each approval basis, the SER provides adequate justification for recommending that the DSA be approved. The SER provides a defensible review of the DSA and appropriately concludes that the DSA and TSR provide a suitable safety basis for advancing startup and supporting safe operation of SWPF.

6.0 FINDINGS

EA did not identify any findings during this assessment.

7.0 OPPORTUNITIES FOR IMPROVEMENT

EA did not identify any opportunities for improvement during this assessment.

Appendix A
Supplemental Information

Dates of Assessment

September 2017 – October 2018

Office of Enterprise Assessments (EA) Management

William A. Eckroade, Acting Director, Office of Enterprise Assessments
Thomas R. Staker, Director, Office of Environment, Safety and Health Assessments
William E. Miller, Deputy Director, Office of Environment, Safety and Health Assessments
C.E. (Gene) Carpenter, Jr., Director, Office of Nuclear Safety and Environmental Assessments
Kevin G. Kilp, Director, Office of Worker Safety and Health Assessments
Gerald M. McAteer, Director, Office of Emergency Management Assessments

Quality Review Board

Steven C. Simonson
John S. Boulden III
Michael A. Kilpatrick

EA Site Lead for Savannah River Site

Kevin M. Witt

EA Assessors

Kevin M. Witt – Lead
James D. Kekacs
Thomas T. Martin
Joseph J. Panchison

Appendix B
Key Documents Reviewed and Interviews

Documents Reviewed

- 00-700-26169, *SWPF Project Response to SWPF Documented Safety Analysis and SWPF Technical Safety Requirements*, Rev. 0, 12/11/17
- 00-700-26303, *SWPF Project Documented Safety Analysis and Technical Safety Requirements*, Rev. 0, 2/12/18
- 00-700-26687, *SWPF Response to DOE Letter SWPF-18-228*, Rev. 0, 7/24/18
- 00-700-26703, *SWPF Project Corrected Hazard Analysis (V-PHR-J-00007, Rev. 0)*, Rev. 0, 7/30/18
- 00-700-26781, *PVVS Flow Imbalances due to Process Upsets*, Rev. 0, 9/4/18
- 00-700-26801, *Conditions to Validate SS Instrument Calculations (SIL and Instrument Loop Calculations)*, Rev. 0, 9/12/18
- 2017-SA-005917, *Assessment Report for Salt Waste Processing Facility Safety Basis Calculations, Review Comments Dispositions*, Rev. 0, 1/17/18
- DOE-SR Letter SWPF-SER-001, *DOE Safety Evaluation Report For Documented Safety Analysis (S-SAR-J-00002 R0) & Technical Safety Requirements (S-TSR-J-00001 R0)*, Rev. 0, 10/18/18
- J-CLC-J-00013, *High-Turbidity Interlock SIL Verification Calculation*, Rev. 0, 2/26/16
- M-M6-J-0132, *SWPF Process Building Process Cell Wet Sumps SMP-101, SMP-102, and SMP-601 P&ID*, Rev. 9, 8/17/16
- M-CLC-J-00096, *Process Drain Lines Sizing Calculation*, Rev. 1, 11/18/13
- M-CLC-J-00134, *Process Vessel Ventilation System Sizing Calculation*, Rev. 4, 10/5/18
- N-NCS-J-00005, *SWPF Nuclear Criticality Safety Evaluation: Fissile Concentration due to MST*, Rev. 1, 12/7/16
- N-NCS-J-00006, SW*PF Nuclear Criticality Safety Evaluation: Accumulation of NAS in SWPF Equipment*, Rev. 0, 12/9/08
- N-NCS-J-00008, *SWPF Nuclear Criticality Safety Evaluation: Inadvertent Transfers*, Rev. 1, 11/30/16
- PL-MN-8704, *SWPF Nuclear Maintenance Management Program Plan*, Rev. 5, 7/19/18
- Q-PHA-J-00001, *SWPF Preliminary Hazard Analysis*, Rev. 0, 10/15/04
- S-CLC-J-00030, *Accident Analysis of Pressurized Leak Aerosolization Events*, Rev. 2, 9/6/17
- S-CLC-J-00041, *SWPF Fire Radiological Consequence Analysis*, Rev. 3, 4/4/18
- S-CLC-J-00054, *Accident Analysis of Explosion Events*, Rev 2, 1/22/18
- S-CLC-J-00084, *Radiological Consequences of a Seismic Event at SWPF*, Rev. 2, 6/26/18
- S-SAR-J-00002, *SWPF Documented Safety Analysis*, Rev. B, 5/25/17
- S-SAR-J-00002, *SWPF Documented Safety Analysis*, Rev. C, 7/13/18
- S-SAR-J-00002, *SWPF Documented Safety Analysis*, Rev. D, 9/13/18
- S-SAR-J-00002, *SWPF Documented Safety Analysis*, Rev. 0, 10/4/18
- S-TSR-J-00001, *SWPF Technical Safety Requirements*, Rev. B, 5/25/17
- S-TSR-J-00001, *SWPF Technical Safety Requirements*, Rev. C, 7/13/18
- S-TSR-J-00001, *SWPF Technical Safety Requirements*, Rev. D, 9/13/18
- S-TSR-J-00001, *SWPF Technical Safety Requirements*, Rev. 0, 10/4/18
- SRR-DPM-2018-00011, *Transmittal of the Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR) Change Packages Supporting Initial Startup of the Salt Waste Processing Facility*, Rev. 0, 5/24/18
- SRR-SWPF-2018-00017, S*RR Request for Information – SWPF DSA/TSR – Supporting the SWPF Project*, Rev. 0, 3/28/18

- SWPF-18-007, *SWPF Documented Safety Analysis and SWPF Technical Safety Requirements Documents*, Rev. 0, 10/5/17
- SWPF-18-078, *SWPF Documented Safety Analysis and SWPF Technical Safety Requirements Response to Parson*s, Rev. 0, 1/3/18
- SWPF-18-228, *DOE Suspension of Formal Review of the SWPF Safety Basis*, Rev. 0, 7/20/18
- SWPF-18-247, *Logical Inconsistencies and Contradictions in the Handling of Safety Basis Controls*, Rev. 0, 8/7/18
- SWPF-18-251, *Status of SWPF Safety Basis Review*, Rev. 0, 8/10/18
- SWPF-18-282, *Completion of SWPF Safety Basis Review*, Rev. 0, 9/25/18
- SWPF-19-005, *SWPF Documented Safety Analysis and SWPF Technical Safety Requirements Comment Verification*, Rev. 0, 10/5/18
- SWPF-19-006, *Notification of Approval of SWPF DSA and TSR*, Rev. 0, 10/18/18
- V-PHR-J-00007, *SWPF Hazard Analysis*, Rev. 0, 6/28/18
- WSRC-SA-6 *Defense Waste Processing Facility (DWPF) Safety Basis*, Rev. 36, 7/1/17
- WSRC-SA-2002-00007 *SRS Concentration, Storage, and Transfer Facilities (CSTF) Safety Basis*, Rev. 20, 8/1/17
- WSRC-SA-2003-00001, Saltstone Facility Documented Safety Analysis, Rev. 14, 12/1/17
- X-SD-J-00005, *Drains System Description*, Rev. 1, 8/6/15

Meetings/Interviews

Parsons

- Nuclear Safety Manager
- Deputy Nuclear Safety Manager
- SWPF Hazard Analysis Supervisor
- Nuclear Safety Engineers (3)

DOE-SR

- Federal Project Director for SWPF
- Nuclear Safety Basis Review Team Lead
- Commissioning and Operations Division Director
- Engineering and Quality Assurance Division Director
- Safety Basis Review Team Members (8)