

**Office of Enterprise Assessments
Assessment of Work Planning and Control at the
Savannah River Site
Salt Waste Processing Facility**



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Acronyms

AAP	Annual Assessment Plan
ALWCD	Activity-level Work Control Document
APAP	Annual Performance Assurance Plan
CAS	Contractor Assurance System
CFR	Code of Federal Regulations
CMMS	Computerized Maintenance Management System
CPARS	Contractor Performance Assessment Report System
CR	Condition Report
CRAD	Criteria and Review Approach Document
CY	Calendar Year
dB	Decibels
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DOE-SR	DOE Savannah River Operations Office
DPO	Differing Professional Opinion
EA	Office of Enterprise Assessments
ECP	Employee Concerns Program
ES&H	Environment, Safety, and Health
FR	Facility Representative
FRC	Facility Representative Council
FY	Fiscal Year
IH	Industrial Hygiene
IPAM	Integrated Performance Assurance Manual
ISMS	Integrated Safety Management System
ISOT	Integrated System Operability Test
JHA	Job Hazards Analysis
LO/TO	Lockout/Tagout
MFO	Management Field Observations
MRB	Management Review Board
OFI	Opportunity for Improvement
OPEX	Operating Experience
ORPS	Occurrence Reporting and Processing System
OSQA	Office of Safety and Quality Assurance
OTWI	One-Time Work Instruction
PIC	Person in Charge
PJB	Pre-Job Briefing
POD	Plan of the Day
POW	Plan of the Week
PPE	Personal Protective Equipment
RDS	Rounds
SC	Significance Category
SME	Subject Matter Expert
SOM	Shift Operations Manager
SOP	Standard Operating Procedure
SOT	System Operability Test
SRIP	Savannah River Implementing Procedure
SRM	Savannah River Manual
SRR	Savannah River Remediation, LLC
SRS	Savannah River Site

SSO	Safety System Oversight
STAR	Site Tracking, Analysis, and Reporting
SWPF	Salt Waste Processing Facility
SWPFPO	DOE Salt Waste Processing Facility Project Office
TQP	Technical Qualification Program
WO	Work Order
WP&C	Work Planning and Control

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EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE) Office of Worker Safety and Health Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of the work planning and control (WP&C) program at the Savannah River Site Salt Waste Processing Facility (SWPF). This assessment was conducted within the broader context of a series of targeted assessments of WP&C at sites across the DOE complex. EA also examined contractor assurance system (CAS) oversight activities, as well as DOE SWPF Project Office (SWPFPO) oversight of WP&C at SWPF. Parsons is under contract with DOE to design, construct, and commission and operate for one year the SWPF, and SWPFPO, an office within the DOE Savannah River Operations Office (DOE-SR), provides Federal oversight.

The SWPF project is in the testing and commissioning phase. In anticipation of the upcoming operational readiness reviews, DOE SWPFPO requested that EA conduct an assessment of WP&C. This assessment focused on the effectiveness of the Parsons' WP&C program, through activity-level observations at SWPF, interviews, observation of meetings, and review of WP&C documents.

SWPF Work Planning and Control

For the most part, the Parsons' WP&C program is sufficiently implemented for the effective performance of work. The plans, procedures, and processes appropriately address the Integrated Safety Management System core functions and include the involvement of workers and environment, safety, and health subject matter experts; address the use of stop work; provide useful checklists for pre-job briefings and job hazards analyses (JHAs); and encourage the use and development of lessons learned. The maintenance trial test plan, which demonstrates potentially challenging maintenance evolutions prior to the introduction of hazardous materials, is a **Best Practice**. All organizations within SWPF have a hazards identification and analysis process which in general is effectively implemented, and managers and workers are experienced and well qualified. Work is appropriately scheduled, authorized, and released. The reviewed operational and test procedures are written in a clear manner. The observed pre-job briefings were thorough, presented by knowledgeable and prepared individuals, and effective in communicating important information about the work activity, including lessons learned and the right to take a safety pause if needed. In general, observed work was conducted within established controls, and workers wore appropriate personal protective equipment.

EA observed a maintenance work activity, which involved replacing filter media, conducted the first week of the assessment, which for the most part was conducted safely. During the second week of the assessment, SWPF experienced a spill of 10,000 gallons of water, as a result of a valve that had inadvertently been left open during this maintenance work activity. Parsons' response to the spill was appropriate; they stopped the spill, paused work, and conducted a thorough fact-finding meeting.

EA identified issues with inadequate identification of hazards and selection of controls. The governing documents for JHAs and test procedures do not provide adequate direction as to when to conduct a JHA and do not address the need to capture controls from the JHA in test procedures. All test procedures are covered by one JHA, which is inadequate to ensure that all task-related hazards are identified, analyzed, and controlled. Also, the hearing conservation program is not effectively implemented.

SWPF Feedback and Improvement

SWPF feedback and improvement processes and procedures appropriately address and encourage the use of lessons learned, and provide avenues for providing feedback. Workers are encouraged to provide input into WP&C processes and provide feedback on a regular basis. Parsons' response to the spill event was appropriate; the fact finding was conducted in accordance with the approved SWPF procedure, included the appropriate personnel and supporting documentation, and resulted in appropriate corrective actions. This response provided a good example of learning from an internal operating experience through the fact-finding process. The Parsons organization overall is adequately scheduling and performing assessments, identifying deficiencies, and managing the deficiencies through its issues management system.

EA identified two problems with Parson's feedback and improvement systems. First, although workers provide feedback on a regular basis, in five of six cases reviewed by EA, Parsons did not document any action to address the feedback. Second, the significance levels of some issues are assigned at a lower level than procedurally prescribed.

DOE-SR Oversight

DOE-SR and SWPFPO have comprehensive integrated processes for Federal line oversight. The processes includes assessment planning and performance, operational awareness activities, issues management, and performance assurance analysis to adequately evaluate SWPF safety performance and the effectiveness of WP&C and CAS. Oversight staff are well-qualified and technically competent. DOE-SR has demonstrated a strong commitment to improving WP&C, including assigning a WP&C lead to provide focus and continued emphasis. SWPFPO is providing appropriately focused and value-added oversight during the testing and commissioning phase of the project to help ensure operational readiness. However, DOE-SR has an ineffective operational experience program for developing, sharing, and implementing lessons learned.

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1.0 PURPOSE

The U.S. Department of Energy (DOE) Office of Worker Safety and Health Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of the work planning and control (WP&C) program at the Savannah River Site (SRS) Salt Waste Processing Facility (SWPF). This assessment was conducted within the broader context of a series of targeted assessments of WP&C at sites across the DOE complex. EA conducted the onsite portions of this review July 10-14 and July 24-27, 2017.

EA performed this independent assessment at SWPF in consideration of the former Deputy Secretary's response to the Defense Nuclear Facilities Safety Board's letter and technical report DNFSB/Tech-37, which included a commitment to enhance Federal oversight of activity-level WP&C. Additionally, the WP&C program assessment is within the broader context of EA's targeted assessments of programs at DOE sites that have high-consequence activities or whose performance may present significant risks in accordance with DOE Order 227.1A, Independent Oversight Program.

2.0 SCOPE

EA conducted this assessment in accordance with the *Plan for the Office of Enterprise Assessments Assessment of the Work Planning and Control Program at the Savannah River Site Salt Waste Processing Facility*, dated July 2017. This assessment evaluated the effectiveness of SWPF implementation of the Integrated Safety Management core functions (Define Scope of Work, Identify and Analyze Hazards, Identify and Implement Controls, Perform Work Safely within Controls, and Feedback and Improvement) with respect to the WP&C implementation in startup testing and maintenance activities in the SWPF. This assessment also evaluated elements of the feedback and improvement program, as well as the DOE Savannah River Operations Office (DOE-SR) and SWPF Project Office (SWPFPO, an office within DOE-SR) processes for oversight of WP&C activities.

3.0 BACKGROUND

The Savannah River Site (SRS) is located in south-central South Carolina and occupies an area of about 310 square miles in Aiken, Barnwell, and Allendale counties. The management and operating contract for SRS is held by Savannah River Nuclear Solutions, LLC (SRNS). Parsons is under contract with DOE to design, construct, and commission SWPF. Construction work was completed in April 2016. The project is in the testing and commissioning phase, with over 50% of the system operability tests (SOTs) complete. SOTs will be followed by integrated system operability tests (ISOTs), then integrated water runs, and cold commissioning. Process hazardous materials have not yet been introduced into the facility. The DOE Operational Readiness Review is scheduled to be completed by the end of 2018. The Parsons contract includes operation of the facility for one year after startup, at which point SWPF will be sending product to the Defense Waste Processing Facility, which is part of the liquid waste operations managed by Savannah River Remediation, LLC (SRR) under a separate prime contract to DOE. Oversight of SWPF is provided by DOE-SR and the SWPFPO line oversight organization.

SWPF is designed to process radioactive liquid waste and is located in the J-Area at SRS. The overall

mission of SWPF is to separate and concentrate the radioactive cesium, strontium, and actinide contaminants from the high-Curie salt solutions that are to be removed from the liquid waste tanks in the F- and H-Area Tank Farms at SRS. The concentrated cesium, strontium, and actinide waste slurry containing most of the radioactive contaminants will be sent to the Defense Waste Processing Facility for immobilization in a glass formulation by a vitrification process. The decontaminated salt solution left after removal of the highly radioactive contaminants will be sent to the Saltstone Production Facility for immobilization in a grout mixture and disposal in above-ground grout vaults.

SWPFPO requested that EA perform this assessment as a means to assist the facility in preparing for its initial start-up, currently scheduled for fiscal year (FY) 2018.

4.0 METHODOLOGY

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 various terms to document specific assessment results. In this report, EA uses the terms “deficiencies, findings, and opportunities for improvement (OFIs)” as defined in DOE Order 227.1A. DOE line management and/or contractor organizations must develop and implement corrective action plans for deficiencies identified as findings. Other important inadequacies not meeting the criteria for a finding are also highlighted in this report and are summarized as deficiencies in Appendix C. These deficiencies should be addressed consistent with site-specific issues management procedures.

As identified in the assessment plan, this assessment considered requirements based on selected objectives and criteria from within DOE Guide 226.1-2A, *Federal Line Management Oversight of Department of Energy Nuclear Facilities*, Appendix D: Activity-Level Work Planning and Control Criterion Review and Approach Documents with Lines of Inquiry. EA used elements of Criteria and Review Approach Document (CRAD) 45-21, *Feedback and Continuous Improvement Assessment Criteria and Approach – DOE Field Element*, to collect and analyze data on SWPFPO oversight activities related to WP&C.

EA examined key documents, such as work packages, procedures, analyses, policies, training and qualification records, and numerous other documents. EA also conducted interviews of key personnel responsible for developing and executing the associated programs; observed maintenance, testing, operations, and construction activities; and walked down significant portions of the SWPF facility. The members of the EA assessment team, the Quality Review Board, and EA management responsible for this assessment are listed in Appendix A. A detailed list of the documents reviewed, personnel interviewed, and observations made during this assessment, relevant to the findings and conclusions of this report, is provided in Appendix B.

EA has not conducted a recent assessment of SWPF. Therefore, there were no items for follow-up during this assessment.

5.0 WORK PLANNING AND CONTROL PROGRAM

Objectives:

The Organization has developed and approved WP&C processes to enable safe performance of work. (DOE Guide 226.1-2A, Appendix D, Objective WP&CI-1)(Criteria #3 and 6)

The Organization has established a management and organizational framework for (1) initiating, analyzing, planning, and approving activity level work and (2) authorizing, releasing, and safely performing activity level work. (DOE Guide 226.1-2A, Appendix D, Objective WP&C1-4)(Criterion #5)

SWPF is a major nuclear project in the testing and commissioning phase. The DOE-approved document for SWPF, P-EIP-J-00001, *Integrated Safety Management System Description*, has been revised to reflect the current project phase of testing. This document appropriately addresses activity-level functions, responsibilities, authorities, and competencies; hazards analysis and controls; and work authorization and performance. The worker safety and health program for the testing phase of SWPF is documented in S-CIP-J-00003, *SWPF 10 CFR 851 Worker Safety and Health Program*. S-CIP-J-00003 appropriately addresses worker involvement in the activity-level processes, including the job hazards analysis (JHA) process and pre-job briefings (PJBs), as well as stop work authority. Appropriate roles and responsibilities are defined in V-IM-J-00001, *Organization, Roles, and Responsibilities Manual*, with sections for project management, plant operations, engineering, construction, testing, etc.

The work control program during the testing phase of the project is adequately described in PL-MN-8709, *SWPF Work Control Program Plan*. Environment, safety, and health (ES&H) subject matter experts (SMEs) and workers are required to participate in JHAs and walkdowns, and all are expected to stop or pause work if the step cannot be performed as written. The procedure leverages the implementing procedures used by the various organizations (testing, maintenance, operation, and construction) for the five core functions of the Integrated Safety Management System (ISMS). Activity-level work control documents (ALWCDs) include maintenance work packages, construction work packages, operations technical procedures, and test procedures.

WP&C processes for operations, testing, and construction during the testing phase are appropriately contained within PP-OP-8523, *Operations Work Authorization and Release*, and for the most part are consistent with PL-MN-8709. The Work Release Coordinator performs deconfliction of planned work during the plan-of-the-day (POD) meeting, and authorized work is listed on form SWPF-676, *Scheduled Work*. This procedure introduces the use of a one-time work instruction (OTWI), which can be used in lieu of an approved test instruction or operating procedure, and has its own hazards identification and controls process. At the time of this assessment, over 150 approved OTWIs had been developed, covering a wide range of activities and complexities. Per discussion with the Operations Management staff, the OTWIs are primarily used to support testing activities and “one off” type work, and are expected to be discontinued when testing and commissioning activities are completed.

Project procedure PP-OP-8534, *Pre-Job Brief and Post Job Feedback*, requires a walkdown of the job site and a review of the JHA for hazards and controls. A useful checklist for PJBs has been developed in SWPF-762. The procedure requires the person in charge (PIC) to obtain post-job feedback so that lessons learned can be applied to future work activities, and is documented on SWPF-763.

WP&C processes used for maintenance are adequately described in PP-MN-8740, *Maintenance Work Control*. The results of the JHA process are documented in a permit to work and are included with the work order, which is forwarded to the appropriate SMEs for review. The procedure includes a list of activities in section 5.2.2.3 that are not to be performed as minor maintenance/support activities, and Appendix C of the procedure contains examples of work that may qualify as minor maintenance as well as work that may not qualify. Neither the list nor Appendix C addresses critical lifts, which could result in work involving critical lifts being performed as a minor maintenance activity without task-specific JHAs. Per discussion with the work planning manager, the omission of critical lifts in this procedure was an error. **(Deficiency)** Parsons utilizes a computerized maintenance management system (CMMS), Maximo, which is not the same CMMS used by SRR, the liquid waste operations contractor that will be assuming operation of the SWPF. The maintenance work histories, post-job feedback, and other

performance data and metrics being stored in Maximo are useful for scheduling preventive maintenance, determining system health, and establishing reliability, availability, and maintainability information; however, no plans are in place to transfer the information in Maximo to the CMMS used by SRR. (See **OFI-SWPF-01.**)

Parsons selected 16 maintenance evolutions for trials prior to the introduction of hazardous materials, as documented in PL-MN-8701, *Maintenance Trial Test Plan*. These evolutions represent potentially challenging maintenance activities, such as repairing equipment located within a hot cell. The trials were designed to demonstrate the mechanical aspects of the evolution, validate the maintenance instructions, and provide training for the maintenance technicians. Additionally, Parsons expects the trials to provide an estimate of the time required to complete the evolution, which will be useful for radiation dose management. EA considers this innovative approach to be a **Best Practice**.

The processes for developing JHAs for testing, maintenance, and operations activities are adequately addressed in PP-SH-4407, *Job Hazards Analysis*, which requires the establishment of a JHA review team led by a trained JHA facilitator and including representation from at least one worker from each work group involved, ES&H SMEs, work group supervisors, and a responsible manager. The procedure requires the team to perform a walkdown of the proposed activity, although documentation is not mandatory. However, PP-SH-4407 does not address when a JHA is required to be developed. The procedure references SWPF-759, *JHA checklist*, to aid in the development of JHAs. SWPF-759 includes useful reference material, such as a list of potential hazards and brainstorming “what-if” type questions, and a reminder to review applicable lessons learned.

ALWCDs for testing are governed by project procedure PP-CM-8102, *Startup Test Procedure Administration*, and DP-CM-8012, *Additional Guidance on SOT/ISOT Procedure Development*. Adequate guidance is provided for general formatting information, including the use and formatting of notes, cautions, and warnings. However, the documents do not address the process for capturing JHA controls in the procedure. The lack of guidance in the governing documents for JHAs and test procedures has resulted in Parsons not conducting test-specific JHAs, not identifying task-specific hazards, and not capturing hazard controls in test procedures, as discussed in Section 6.0. This lack of guidance in the governing documents is contrary to 10 CFR 851.21(a)(5) “Evaluate operations, procedures, and facilities to identify workplace hazards,” and 851.22(a)(1) “For hazards identified either in the facility design or during the development of procedures, controls must be incorporated in the appropriate facility design or procedure.” It is also counter to Parsons’ 10 CFR 851 Worker Safety and Health Program, which states that “JHAs will be conducted for all testing activities ... and will be initially conducted at the highest level for the work package.” (See **F-SWPF-01.**)

For construction activities, the Parsons’ WP&C process is described in PP-CS-7201, *Construction Work Control Process*. The procedure requires work to be accomplished through work packages, which are to address the scope of work, JHA, work authorization, relevant documents including work instructions, and work package review and approval. The procedure requires work activities to be identified with sufficient completeness to perform a JHA, and requires coordination with worker representatives, ES&H, and SMEs. Requirements for PJBs, daily work authorization including safe work briefings, and work package execution are adequately addressed. The JHA process for construction activities is defined in PP-SH-4364, *Job Hazards Analysis*, which appropriately addresses the identification of discrete work activities, a field walkdown, a review for immediate and peripheral hazards, a hazard evaluation checklist, the review of lessons learned, and the identification of controls. Worker involvement is specifically addressed. The procedure allows for the development of a common construction JHA, as well as job-specific JHAs. In addition to the JHA process, the construction procedure refers to a safety planner process, which can be used for one-time work activities, or if new work scope or hazards are identified for planned work sequences that were not addressed in the approved JHA. The safety planner process is documented on

form SWPF-424, and includes the location of work, work description, a table of work steps, hazards and controls, PPE, special equipment and work permits, a daily work area assessment, and review signoff by a safety professional and approval by the foreman/superintendent. This process is inconsistent with step 2.2(2) of the same procedure, which states that JHAs are revised when the safety requirements change, work area conditions or hazards change, or the work scope changes and introduces new hazards. The safety planner process is not as rigorous as the JHA process (e.g., does not specify a field walkdown, involvement of workers or SMEs in the identification of hazards or controls, change control).
(Deficiency)

6.0 WORK PLANNING AND CONTROL IMPLEMENTATION

6.1 Define Scope of Work

Objective:

The scope of work is described in sufficient detail to allow the work planning process to identify hazards associated with the work and to develop necessary schedules, priorities, and work instructions. (DOE Guide 226.1-2A, Appendix D, Objective WP&C2-1)(Criteria #2 and 3)

In general, the scope of work is sufficiently described in observed work packages. EA observed portions of a multi-day maintenance activity, WO-32814, *Install FLT-222A Filter Media*. This was a complex, first-time-use activity involving a critical lift that required coordination among maintenance, construction, and operations. The work scope was adequately described in the work order details and asset details. It included a brief description of the work, location, room, piping and instrumentation diagram, relevant system (i.e., Alpha Finishing System), etc. The work order listed tasks, including the requirement to perform specific maintenance, construction, and operations activities.

EA reviewed a sample of test procedures (SOT-LC-001, SOT-DIW-001, and SOT-CWCR-001) and found that the test procedures adequately describe the scope of the system that is being tested, as well as the testing attributes to be verified during the test. Some activities that support the SOTs are conducted using OTWIs. As an example, the scope included in the attachment to OTWI-2017-149, *Systemization for Sample Pumps, Lab 002*, adequately described the scope associated with this testing activity.

For construction activities, PP-CS-7201 requires the scope of work to be described in the work package. EA observed work being performed under work package WP-2071 to erect a metal weather canopy for the temporary tank farm. The specific task involved attaching five-foot-tall steel skirts below the eaves of the canopy. The scope of work was adequately described for this straightforward construction activity.

6.2 Identify and Analyze Hazards

Objective:

All hazards that could potentially adversely impact workers, the public, the environment, the facility, and its equipment are documented and analyzed for severity/significance. (DOE Guide 226.1-2A, Appendix D, Objective WP&C2-2)(Criteria #2, 4, 5, 7, and 8)

PP-SH-4407 requires JHAs for testing, maintenance, and operations activities to be led by a trained JHA facilitator. EA reviewed a sample of eight JHAs and confirmed that a trained JHA facilitator was assigned to each. The SWPF qualification card for a JHA facilitator includes a training class, SWPOG101.BR0100, *JHA Facilitator*; completion of a practical factor of leading a JHA; and reading the

JHA procedure. The training course appropriately covers JHA-related responsibilities, including ensuring workers and ES&H SMEs are on the team, walking down the work area, identifying hazards, analyzing and selecting controls, etc. All employees are required to take general employee training SWPSGR01, *SWPF Basic Safety*, which is a six-hour training class that discusses worker involvement in safety, including participation on JHA teams, providing feedback, stop/pause work, and how controls are identified in ALWCDs and PJBs. A review of training records for a sample of seven Parsons' employees confirmed that all had completed the *SWPF Basic Safety* training course. JHA facilitators are adequately trained, and the basic safety training is adequate for workers to understand how they contribute to the safe performance of work.

Separate JHAs were conducted for the maintenance and construction activities for maintenance job WO-32814. For this activity, the construction organization was responsible for performing the critical lift and generated a safety planner, WO-32814 JHA-2013, which identified appropriate controls for the hazards identified for the construction work. The maintenance permit to work JHA addressed the hazards associated with broad task descriptions (e.g., remove the cross flow filter housing). A JHA was not conducted for the three maintenance instructions included with the work order. The noise hazard associated with the use of the impact wrench was not identified. This omission represents a potential noncompliance with 10 CFR 851.21(a)(5) "Evaluate operations, procedures, and facilities to identify workplace hazards," and 851.22(a)(1) "For hazards identified either in the facility design or during the development of procedures, controls must be incorporated in the appropriate facility design or procedure." **(Deficiency)**

Project procedure PP-SH-4440, *Occupational Noise Exposure Prevention and Control/Hearing Conservation*, was developed in 2017 to support the transition of the project from construction to general industry. The 10 CFR 851 Worker Safety and Health Plan references this procedure as the implementing document for the hearing conservation program. The procedure requires that IH conduct, as needed, individual noise dosimetry to determine workers' eight-hour time weighted average exposure. Limited noise dosimetry data during the testing phase has been collected. The procedure also requires audiometric testing for personnel enrolled in the hearing conservation program. Per discussion with IH, some baseline audiometric testing was performed for construction workers; however, audiometric testing for testing and operations personnel is by exception. Only five employees were provided a baseline audiogram in August 2016, based upon a one-time performance test of the plant air compressors involving air exhausted through a temporary pipe modification. The procedure also requires IH to conduct periodic evaluations for equipment, tasks, or locations with the potential to generate noise levels in excess of 85 decibels (dB) steady-state or 140 dB impulse noise. SWPF has conducted noise surveys in 144 areas in the SWPF facility and documented the results in an Excel spreadsheet. As a result of initial testing of HVAC fans in room 202, the continuous noise level was determined to be 97 dBs. SWPF has appropriately posted this area as requiring hearing protection for personnel working in the area (personnel passing through the room are not required to wear hearing protection). Per discussion with the IH specialist, no personnel other than construction are currently in the hearing conservation program; however, IH specialists are evaluating whether some employees should be in the program when the facility is operational. Parsons' IH conducted an assessment of the occupational noise exposure prevention methods in December 2016, and the assessment report stated that "IH will evaluate work descriptions for "Testing and Commissioning" activities and make recommendations as needed to begin a "hearing conservation program." Parsons could not produce a record of this evaluation being performed. SWPF does not have sufficient data documented to substantiate time weighted average noise levels (i.e., access logs/stay times in high noise areas or personal monitoring data), and does not have an auditable plan for establishing a high noise exposure baseline once the facility equipment and personnel begin frequent/routine operations. Parsons has not sufficiently assessed worker exposures to hazardous noise as required by their procedure PP-SH-4440 and 10 CFR851.21 (1). **(See F-SWPF-02)**

EA observed an adequate tabletop review of a maintenance trial for the performance of thermocouple maintenance, WO 33867, *Perform Thermocouple Maintenance Trial*. The tabletop review included appropriate representation and participation from electrical maintenance, safety, instrumentation and controls, engineering, work planner, radiological controls, quality controls, and operations. The lead for the tabletop indicated that the safety hazards were nearly all addressed by the JHA. However, the team identified additional potential hazards (e.g., floor opening, and working with a 53-foot thermocouple) and agreed to walk down the job area. The radiological control representative stressed the opportunity to learn from this evolution in preparation for the introduction of hazardous materials.

JHA-2016-001, *SOT and ISOT Performance*, is an activity-level JHA that encompasses all SOTs and ISOTs. There are 60 SOTs and 5 ISOTs, ranging from relatively simple systems that do not involve hazardous materials to systems that are complex and/or related to safety (e.g., fire detection and suppression, radiation monitoring, hot cells, and centrifugal contactors). Per discussion with the JHA facilitator, the review team selected sample tests which were reviewed for tasks that were expected to be encountered during the performance of all testing. The tasks were general in nature (e.g., drum movement, confined space, fork lift operation). Parsons did not conduct a specific JHA for each SOT, as required by S-CIP-J-00003, 10 CFR 851 Worker Safety and Health Program, Section 6.2.6, *Job Activity-Level Hazard Analysis*, which states that “JHAs will be conducted for all testing activities ... and will be initially conducted at the highest level for the work package ...” This resulted in tasks not being evaluated such as the running of stationary pumps and air handling units. Also, Parsons did not identify or analyze the potential for higher air pressure from the ventilation balancing testing causing the fire doors to remain open, thus negating a hazard control. (See **F-SWPF-01**.)

6.3 Identify and Implement Controls

Objective:

Controls are identified and implemented that effectively protect against identified hazards and approved activity-level work control documents can be performed as written. (DOE Guide 226.1-2A, Appendix D, Objective WP&C2-3)(Criteria #2, 3, 4, 5, 6, 7, and 8)

EA reviewed ALWCDs, including test packages, maintenance work packages, and operational procedures, to determine whether appropriate controls were identified and integrated into the ALWCDs. Operations prepares activity-specific JHAs for their work through technical procedures that include standard operating procedures (SOPs) and rounds (RDS). Operational documents, including OTWI-2017-116, *Starting Plant Air Compressors*; SOP-AIR-001, *Plant Air System*; and RDS-TEST-001, *Testing Rounds*, appropriately included the controls from the JHA directly into the ALWCD, and annotated the step with a capital “J.” This process is a worker-friendly manner of ensuring that JHA controls are located in the appropriate work step. In general, the reviewed SOPs and testing RDS are written in a clear manner and identify hazard controls such that the procedures can be performed safely.

JHA-2015-037, *Testing Rounds, Cold Weather Rounds, Temporary Tank Water Removal, Temporary Tank Farm Rounds, Plant Air Rounds*, was used in the development of RDS-TEST-001, and JHA-2015-002, *Plant Air System*, supports activities associated with Procedure SOP-AIR-001. EA observed the performance of RDS-TEST-001, and noted a discrepancy with the controls listed in the JHA and the RDS procedure. Parsons has since added new hazards and controls to the JHA and the RDS procedure. Procedure SOP-AIR-001 appropriately captured the controls identified in the referenced JHA-2015-002. Although JHA-2015-002 included the task “Starting Air Compressor Using Air Bottles,” it did not further analyze this task to identify hazards and controls. Per discussions with the operations manager and deputy operations manager, they had noted inconsistencies in the selection of controls and were working to establish common controls for similar hazards.

A review of SOTs confirms that the test procedures are written in a clear manner and can be performed as written, although they do not identify hazard controls in the steps. The SOTs contain a prerequisite to ensure that an approved work package/work permit is available, and ensure that safety equipment and personal protective equipment (PPE) identified in the work package/permit are available. Per discussion with a test engineer, these prerequisites are meant to ensure that the test package was included on form SWPF-676 and authorized work for that day. Also per discussion with test engineers, the hazard controls are not developed for specific tests and are not integrated into the ALWCD, thus requiring the PIC to ensure that the appropriate controls from the JHA are addressed during the PJB. (See **F-SWPF-01**.)

The ALWCD associated with the maintenance activity WO-32814 is the work package that includes the work order and maintenance instructions. The maintenance work package includes the permit to work, which identifies the controls for the hazards that include working with/near suspended loads. The construction organization was responsible for performing the critical lift, and generated a safety planner, JHA-2013, that identified appropriate controls for the hazards identified for the construction work. These controls included PPE, trained and certified workers, fall protection equipment, barricades, and signage. The controls for the maintenance work were identified on the permit to work, and included controls for PPE, the use of proper lifting techniques, lockouts, fall protection, trained and qualified workers, and a portable safety shower/eyewash station. As noted in Section 6.2, the noise hazard produced by the use of the impact wrench was not identified; therefore, the PJB did not identify the use of hearing protection, and hearing protection was not included on the posting at the job barricade. As soon as the noise hazard was introduced into the worksite, appropriate controls (ear plugs) were distributed to workers and observers.

6.4 Perform Work Safely Within Controls

Objective:

Work is conducted diligently in accordance with approved work instructions and within established controls. (DOE Guide 226.1-2A, Appendix D, Objective WP&C2-4)(Criteria #2, 3, and 5)

Work is scheduled through POD and plan-of-the-week (POW) meetings. PP-MN-8727, *Maintenance Work Scheduling*, states that the purpose of the POW is to develop and approve planned activities for the following week, and discuss and deconflict upcoming work weeks. EA observed five POD meetings and one POW meeting. Due to the plant being in the testing mode, the POD meetings were jointly conducted by the operations and testing personnel, with operations providing the status of the facility and any ongoing work, and testing personnel serving as the POD coordinator. Work was appropriately deconflicted during the POD, personnel were requested and assigned, and the SOM authorized work release as documented on form SWPF-676. Work that was not on the SWPF-676 form could not be performed until it was added by the SOM. Each organization provided schedule input in a different format. The testing schedule consisted of a listing of the tests that were planned to be conducted for weeks 1, 2, and 3. The maintenance schedule provided more information, including system, item, work group, work type, status, target start and finish, and priority code. The construction schedule was in a project timeline format. The schedules were not integrated, and did not include projected work hours for personnel (See **OFI-SWPF-01**.)

PP-OP-8534, *Pre-Job Brief and Post Job Feedback*, requires PJBs prior to the beginning of work activities. EA observed PJBs for two tests and one maintenance job. The observed PJBs were thorough, presented by knowledgeable and prepared individuals, and effective in communicating important information about the work activity, including lessons learned. The use of a PJB checklist and reverse

briefing technique added to the effectiveness of PJBs. The PICs addressed applicable controls from the JHA, and emphasized the right to take a safety pause if needed.

Based on interviews, observation, and review of training records, the selected managers and workers are experienced and well qualified. The interviewed senior managers had extensive experience in their respective fields. EA reviewed the training records for a test engineer, a maintenance engineer, three maintenance workers, and three construction workers, and found that all had completed numerous relevant training courses, including basic safety and work control. All but one had completed a course on hearing protection. During the transition from construction to testing, there was a one-week stand down during which refresher training was provided. During this EA assessment, personnel were being trained on the introduction of chemicals into the temporary tank farm, and all operations and maintenance personnel were attending radiological worker training. Also, in anticipation of the introduction of large quantities of chemicals at SWPF, the 2017 SWPF annual drill schedule includes drills related to chemical spills.

During a night shift, the SOM discovered a spill of 10,000 gallons of water during a routine walkthrough of the facility. Operations appropriately took action to identify and correct the direct cause of the leak (a pump casing drain valve had been left open during maintenance job WO-32814 that was performed two weeks earlier). EA observed the SOM turnover and shift crew briefing during which the event was discussed. A fact finding was scheduled (discussed in Section 7.1), and during the POD, the commissioning and testing manager enacted a pause work for operations and maintenance activities. As part of the fact finding, Parsons identified actions that required completion prior to the resumption of work, including a briefing of Parsons Personnel, evaluation of existing administrative locks, and verification of system lineup. The commissioning and testing manager confirmed completion of the pre-start activities and lifted the pause work. Parsons appropriately responded to the event.

EA observed portions of the above maintenance work activity, WO-32814, *Install FLT-222A Filter Media*, which resulted in the spill. This maintenance activity involved work by three organizations – maintenance, construction, and operations. The work order was augmented by three work instructions (listed in order of accomplishment): SWPF-MI-007, *FLT-222 Cross Flow Filter Housing Removal*; SWPF-MI-008, *FLT-222 Tubesheet Installation*; and SWPF-MI-006, *FLT-222 Cross Flow Filter Housing Installation*. EA also observed portions of the work associated with SWPF-MI-007 and SWPF-MI-008. The work was performed under the first-time use validation process, which allowed for changes to be made to the procedure as the work was performed. The “circle slash” method was used to indicate completion of the step. Personnel wore appropriate PPE, and controls for identified hazards were in order.

EA also observed the construction activity, WP-2071, to install steel skirts beneath the eaves of a roof canopy for the temporary tank farm. The work was conducted in a safe manner. The workers in the aerial lift wore fall protection that included harnesses. The area around the aerial lift was roped off to prevent personnel from walking under the load. Workers wore required PPE (hard hat, safety glasses, safety shoes, etc.). Other observed activities included the conduct of an operator round; portions of test activities for SOT-BA-001, *Barium Decay*; and troubleshoot and repair for SOT-PVV-001, *Process Vessel Ventilation*, which were also conducted in accordance with established controls.

7.0 FEEDBACK AND IMPROVEMENT AND SWPFPO OVERSIGHT

7.1 SWPF Feedback and Improvement

Objectives:

The Organization has a feedback and improvement process that fosters learning from both internal and external operating experience and continuous improvement for activity level work. (DOE Guide 226.12A, Appendix D, Objective WP&C1-5)(Criteria #1 and 5; feedback and lessons learned)

The WP&C processes are routinely evaluated by the organization's contractor assurance system (CAS) and feedback and improvement processes, and lessons learned are adequately captured and incorporated into the planning and performance of ongoing and future work activities. (DOE Guide 226.1-2A, Appendix D, Objective WP&C2-5)(Criteria #1-4; feedback and lessons learned)

P-EIP-J-00001, *Integrated Safety Management System (ISMS) Description*, and P-SD-J-00001, *SWPF Contractor Assurance System Description*, state that feedback and improvement includes the assessment program, event reporting, feedback, performance monitoring, lessons learned, and issues management including corrective action. For activity-level WP&C, feedback and lessons learned are addressed in various phases of work planning and performance. Lessons learned, in the form of safety shares, were provided at the beginning of each observed POD meeting and were routinely used at other meetings. Both the Pre-Job Briefing Checklist form and the Post-Job Feedback form specifically address the use of lessons learned, and during the observed PJBs, lessons learned were shared. The workers have opportunities through the JHA process and during PJB and post-job briefings to provide feedback.

EA reviewed five Post-job feedback forms and attended a post-job feedback session. The post-job feedback forms and activity were: WO 30518, *ESV Replacement Maintenance Trial*; WO 30452, *EXT-203A Contactor Removal and Replacement Maintenance Trial*; SOT-LC-001, *Lab Collection* TRR-CM-CWCR-001, *Chilled Water Primary Control Room System*; OTWI-2017-146, *Starting Plant Air System*; and the Post-Job Feedback session for the maintenance work activity WO-32814. The Post-Job Feedback forms showed participation from appropriate workers, and documented feedback suggestions. However, five of the six post-job reviews did not indicate how the feedback would be addressed, as required per PP-OP-8534 (**Deficiency**). Concerns with post-job feedback forms include:

- The Post-job feedback form for WO 30518 included improvements for the instructions and for the process for performing the work, yet there was no indication on the form that the procedure/work package would be updated. Parsons confirmed that the improvements were implemented.
- The Post-Job feedback form for WO 30452 contained several feedback items (methods to improve efficient removal/installation, improvements to the hoist), but the form did not have a method for indicating disposition of the feedback. Parsons confirmed that the improvements were implemented.
- The Post-Job Feedback form for SOT-LC-001 identified the need for more support for backshift activities, but did not indicate how this suggestion would be addressed, as required per PP-OP-8534. Also, the failure to maintain flowrate was due to construction debris clogging the system, which should have been shared as a lessons learned per PP-OP-8534.
- The Post-Job Feedback form for TRR-CM-CWCR-001 noted that the testing identified several design/installation issues, and that system design should be completed prior to developing and initiating the SOT. This form did not indicate how this feedback, which involved another organization, would be addressed, as required per PP-OP-8534.

EA observed a post-job feedback review for the maintenance work activity WO-32814. Two safety shares (heat stress, hearing protection) were discussed. Representation included maintenance (engineering and crew), construction, safety, and operations. The PIC led the Post-Job Feedback session, and there was good interaction and feedback from both the construction and maintenance workers. Suggestions were made to improve the efficiency of the work, and the PIC stated that the JHA may need

to be revised if new hazards were introduced. The participants identified the lessons learned to have hearing protection available for the next iteration of this work. The maintenance and construction workers stated that communication between the two groups had been very good during the maintenance activity. However, Parsons could not locate the documentation on this Post-Job Feedback session.

In response to the spill event described in Section 6.4, SWPF paused work activities until a fact finding was conducted. The fact finding was conducted in accordance with PP-CONOPS-07.3, *Fact Finding*. The plant manager chaired the fact finding, and other senior managers, including the project manager and director of engineering, participated, along with representatives from the involved organizations. The fact finding discovered that the pump casing drain valves had not been closed, contrary to the work order step that had been marked as completed. Parsons appropriately identified that the direct cause was the open drain valve, apparent cause was that the system restoration was not performed in accordance with the work order, and contributing causes included lack of coordination between testing, operations, and maintenance; lack of formality for sign-off; and lack of operations sign-off (operations sign-off is standard practice for construction work). Parsons determined that the event was not reportable in Occurrence Reporting and Processing System (ORPS), since it did not involve hazardous materials and no one was injured. This determination was correct, although Parsons could have elected to report it as a management concern. Parsons identified next steps, including confirm valve lineups, review administrative locks, revise the work order because steps cannot be performed as written, brief personnel on expectations for procedure compliance, and enhance management oversight. Longer-term actions included issuing a required reading/lessons learned and evaluating interface controls and handoff in work orders/work documents, including affected work group review of work order and sign-off of steps. The fact finding was documented in FF-2017-009, *Alpha Finishing Drain Tank Water Overflow*, and correctly captured the event summary, chronology, cause, interim measures, ORPS reportability, resumption of work, etc. EA observed the follow-up briefing to the maintenance crew, which addressed the event, causes, and corrective actions, and outlined expectations for procedural compliance. The maintenance manager also discussed possible improvements including replacing the “circle/slash” process (i.e., a circle marks the step being worked on, and the slash indicates that the step has been completed) with initialing beside the step by the person who performed the step; using templates for the development of work orders, similar to procedures; and considering the use of the hazardous energy control process for select work packages. The response to the event was appropriate; the fact finding was conducted in accordance with the approved SWPF procedure, included the appropriate personnel and supporting documentation, and resulted in appropriate corrective actions. This response provided a good example of learning from an internal operating experience (OPEX) through the fact-finding process.

Another example of appropriate use of the fact-finding process was the result of a pressure safety relief valve relieving. EA reviewed the Post-Job Feedback form for OTWI-2017-146, *Starting Plant Air System*, which stated that a pressure safety valve had relieved, and included a recommendation to revise the SOP to shut down the compressor before the dryer. As a result of this event, Parsons conducted a fact finding. Fact Finding FF-2017-005, *Glycol discharged during Plant Air troubleshooting*, appropriately addressed the event, including a summary, chronology, causes, reportability, etc., and included representation from appropriate organizations (operations, testing, safety, DOE Facility Representative (FR), engineering). Long-term action was to evaluate the plant air SOP for change to ensure compressors are shut down prior to shutting down the dryer.

Per discussion with the lessons learned program coordinator, relevant lessons learned from the DOE database are posted to the Parsons' Sharepoint page. Lessons learned are emailed to managers, and they determine whether the lessons learned is applicable and how it will be shared. SWPF submitted four lessons learned to the DOE Corporate Lessons Learned Database: LL 2017-SR-SWPF-016, *Proper Forklift Operation Must Be Observed at All Times*; LL 2015-SR-SWPF-010, *Component Not Effectively Locked*; LL 2016-SR-SWPF-009, *Energized Temporary Power Cable Cut-Unexpected Discovery of*

Hazardous Energy; and LL 2016-SR-SWPF-004, *Planning and Coordination are Essential to First Time Evolutions*. The lessons learned reports were well written and contained useful information.

Criteria:

The contractor assurance system includes provisions for management and independent assessment of all elements of the WP&C processes, and of specific activity implementation of the process dependent on complexity and hazards of the activity by line and functional area. (48CFR970.5223-1(c) (5); 10 CFR 830.122 (a), (c) (4), (i), and (j) (1); DOE Order 226.1 Att. 1 and 2.b (2) and (5); DOE Order 422.1 Att. 2 2.a. (3) b and c; and DOE Order 433.1B Att. 2 2.b and 2.p)

Assessments are performed at SWPF using PL-AS-1001, *Salt Waste Processing Facility Integrated Assessment Program Plan*, which describes assessment types and internal compliance assessments required frequencies.

Surveillance Reports SWPF-SR-3336, *2015 Self-Assessment Program Review*, and SWPF-SR-3550, *2016 Self-Assessment Program Review*, were performed by the SWPF Assurance Group. The purpose of these assessments was to verify that self-assessments are being scheduled and performed as directed by PL-AS-1001 in the areas of Assurance, ES&H, Engineering, Construction, Commissioning, Operations, and Quality Assurance. The reports were comprehensive and listed the assessments that were performed and reviewed by the self-assessment assessors. A small sample of the assessments performed by the Assurance Group that were related to WP&C were reviewed by EA. These included MSA-16-03, *Integrated Safety Management Effectiveness Review Management Self-Assessment Report*, and V-RPT-J-00061, *Occurrence Reporting and Processing System Performance*, for first, second, and third quarter FY 2016. The assessment reports were comprehensive, data driven, and contained logical, mature conclusions.

PL-OP-8519, *SWPF's Commissioning and Operations Annual Assessment Plan*, includes assessment of several WP&C elements. These included:

- Ensuring that testing is approved by the test manager prior to commencing work;
- Ensuring operations and ES&H review of the lockout/tagout (LO/TO) program, including in-process single or complex LO/TO;
- Ensuring maintenance of WP&C processes, including hazard identification, and hazard controls and mitigation; and,
- Reviewing construction processes, including the conduct of safe work briefs and release of work.

PL-CS-7204, *Construction Self-Assessment Plan for Fiscal Year 2017*, contains monthly assessments of work control processes, such as work package completeness by ensuring that drawings, data sheets, and specifications are of the current revision. This schedule also contains WP&C-related assessments such as maintenance and LO/TO. Most of the assessments were ongoing and not completed at the time of this assessment. The assessments covered the programmatic areas necessary to provide a comprehensive set of assessments of WP&C at SWPF.

Criteria:

The contractor has established WP&C programmatic performance objectives and expectations (i.e., measures or metrics) in order to evaluate the program's effectiveness and promote continued improvement. (48CFR970.5223-1(e); DOE Order 226.1 Att.1 2.b. (6); DOE Order 422.1 Att. 2 2.a. (3) e, f, and g; and DOE Order 433.1B Att. 2 2.o)

Parsons has established project indicators of the health of WP&C. These include: plans and procedures issued due to errors/omissions; Maximo preventive maintenance activities, Maximo corrective maintenance response time, and Maximo corrective maintenance backlog; corrective action closure performance; and condition report significance index. The SWPF Corrective Action Closure Metric tracks the number of open corrective actions with overdue status, and in May 2017, there was only one late corrective action. The purpose of the Condition Report (CR) significance index is to drive reporting of lower-level significance items so that higher significance events can be avoided. From June 2016 through May 2017, there were zero Significance Category (SC) 1 or SC2 CRs. During the same time period, there were 202 SC 3/4 CRs and 210 SC T (tracking) CRs (see definitions below). These performance metrics have been effective in providing focus to these areas; however, EA's review of the significance levels for SWPFPO findings indicates a problem with the proper assignment of significance levels, as further described in the next section.

Criteria:

The contractor has developed processes to identify, categorize, prioritize, track, trend, correct, and close deficiencies associated with the WP&C program. These processes include the requirement to perform corrective action effectiveness reviews. (10 CFR 830.122(c); DOE Order 226.1 Att. 1 2.b. (3); DOE Order 422.1 Att. 2 2.a. (3) a and d; and DOE Order 433.1B Att. 2 2.b, 2.o, and 2.p)

The SWPF CAS is defined by P-SD-J-00001, which provides the framework for the policies, plans, and procedures that comprise the CAS. This document adequately describes the CAS, including management, issues and corrective action management, the integrated assessment program, external assessments, personnel feedback, the employee concerns program (ECP), the differing professional opinion (DPO) program, employee suggestions, the JHA/pre-job/post-job brief, OPEX/lessons learned, performance indicators, quarterly ORPS report to DOE, and annual ISMS Objectives, Measures, and Commitments.

The issues reporting and corrective action management process is adequately described in PP-AS-1203, *Corrective Action Program*. Issues are assigned a significance category (SC) from 1-4 with SC-1 having a **significant** impact; SC-2 having a **moderate** impact; and SC-3 and SC-4 having a **minor** impact. SC-4 issues are corrected on the spot. Parsons does not use the same issues management system as DOE-SR and the SRR liquid waste contractor. (See **OFI-SWPF-01**.)

SWPFPO conducted assessment 2016-SA-005677, *Parsons' Contractor Assurance System Review*. This assessment contained three findings and one OFI; two of the three findings indicated major programmatic deficiencies with the Parson's CAS. Finding 1 involved the self-assessment program and finding 2 involved the corrective action program. The Parsons' corrective actions for these findings resulted in two significance 3 CRs: CR-2017-161 and CR-2017-162. PP-AS-1203 describes significance category 3 issues as having a **minor** impact on safe/secure facility operations, worker or public safety and health, quality, regulatory compliance, or public/business interests. Significance category 2 issues have a **moderate** impact on safe/secure facility operations, worker or public safety and health, quality, regulatory compliance, or public/business interests. Finding 1 stated "Contrary to DOE O 226.1B, DOE 414.1C, Parsons' Self-Assessment Program is not rigorous, risk-informed and does not appear to perform credible or critical self-assessments or identify items, services, and processes needing improvement", and Finding 2 stated "Contrary to DOE O 414.1D, Parsons' Corrective Action Program does not adequately identify the causes of problems, actions to eliminate the cause of the potential non-conformity and prevention of recurrence as a part of corrective action planning." These issues identify major programmatic deficiencies that demonstrate non-compliance with the orders listed in the findings. Parsons' Assurance organization indicated they assigned the lower impact level, as Parsons disagreed with the findings. Based upon the seriousness and breadth of the findings, these findings indicate at least a moderate impact on safe/secure facility operations, and should have been assigned significance category 2. (**Deficiency**)

7.2 DOE-SR and SWPFPO Oversight

Objective:

DOE field element line management has established and implemented effective oversight processes that evaluate the adequacy and effectiveness of CASs and DOE oversight processes. (DOE Order 226.1B)

Processes are in place for Federal line oversight as described in the Savannah River Manual (SRM) 400.1.1G, *Integrated Safety Management System Description Manual*. The ISMS description adequately outlines the interconnecting processes used to evaluate SWPF safety performance, maintain operational awareness, formally evaluate safety performance, provide avenues for communication and evaluation of concerns, and utilize feedback information to promote improvement in safety performance.

The SRM 226.1.1F, *Integrated Performance Assurance Manual (IPAM)*, combines the descriptions for the oversight and quality assurance plans into a single management description document, and provides processes to: (1) plan, conduct, and document assessment activities; (2) transmit assessment results to contractor management; (3) document and track DOE and contractor corrective actions; and 4) conduct and track DOE-SR senior management field observations. The IPAM also describes the Site Tracking, Analysis, and Reporting (STAR) system that provides the automated infrastructure for documenting the results of the oversight processes. The IPAM and the supporting STAR system meet DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, and DOE Order 414.1D, *Quality Assurance*, requirements. The processes provide a solid basis for consistent planning, conducting, documenting, and tracking oversight activities between programmatic oversight conducted by the Office of Safety and Quality Assurance (OSQA) and various line oversight organizations, such as the SWPFPO organizations that oversee SWPF.

DOE-SR has demonstrated a strong commitment to improving WP&C and CAS, including: assigning a well-qualified WP&C programmatic lead to provide focus and continuing emphasis on contractor WP&C improvement, conducting CAS and WP&C programmatic evaluations using review criteria from DOE Guide 226.1-2A, and DOE-SR manager direction requiring line assessment of WP&C and CAS in the annual performance assurance plan (APAP). The line assessments of CAS and WP&C were conducted and the reports reviewed by EA met requirements of the IPAM. An ISMS review declaration conducted in FY16 included a self-assessment by the SWPF contractor, as well as an independent review of contractor performance by DOE-SR. This ISMS review declaration adequately provided self-critical and actionable information to make improvements.

The SWPF project performs work under the original construction contract, and contract performance is assessed through the Federal Contractor Performance Assessment Report System (CPARS). The last CPARS (for the period of July 2015 through June 2016) provided appropriate feedback from its oversight, including feedback on WP&C. While CPARS does not have a standard evaluation area for safety, SWPFPO added safety as an evaluation area for award fee consideration.

OSQA conducted an assessment of FY16 CAS updates submitted by Parsons, providing the basis for DOE-SR approval of the updated SWPF CAS. In addition, OSQA assessed Parsons and other contractor CAS implementation in fourth quarter FY16. The assessments were based on appropriate lines of inquiry and identified many areas for improvement for the SWPF CAS. An SWPFPO assessment of Parsons' SWPF CAS effectiveness noted additional findings related to the surveillance and causal analysis program.

A July 2011 DOE accident investigation report of a fall injury at SRS noted the need for increased SME presence in the field. DOE-SR was not able to provide this increased oversight due to SME resources

committed to required programmatic reviews. In the last two years, DOE-SR management supported OSQA with additional SME resources, including four safety engineer positions, to increase field oversight and support (such as IH and occupational safety expertise) to line organizations. The OSQA Director stated that the safety engineers are qualified to enter assigned field facilities unescorted and plans to establish office space in the field to further increase the effectiveness of SME field oversight and support to DOE-SR line oversight organizations. EA found evidence of increased SME field presence, including STAR entries and SWPFPO personnel acknowledgement of an increased SME presence in their facilities and a willingness to seek out SMEs for additional technical support when needed. The OSQA Director stated that he gave direction that SME support to ensuring SWPF readiness in CY17 is a priority. EA found that OSQA personnel, including WP&C, IH, and occupational safety SMEs, were included on the SWPFPO Integrated Project Team to provide support to the commissioning, testing, and readiness of SWPF. While EA was on site, the WP&C SME oversaw the Parsons' Management Self-Assessment designed to ensure readiness to bring hazardous process chemicals into the facility tank farm. In addition, OSQA IH had provided oversight of the Parsons' Chemical Management and Inventory System.

Communicating oversight results and emergent issues up the line management chain from the FR to the DOE-SR Manager is timely and effective. The daily operation reports provided the facility operations status and meaningful emergent and ongoing issues that may need further management attention. Processes for communicating oversight results to contractors are generally effective.

The SWPFPO Management Review Board (MRB) processes have provided significant value to ensuring annual assessment schedules are being completed, that Parsons' corrective actions regarding DOE-SR issues are appropriate and on track for completion, and assessment report results are accurate and clearly conveyed to Parsons. The monthly scheduling of the MRB meetings however, has added a month and sometimes two to three months for assessment report approvals and their transmittal to Parsons. In addition, assessment 2016-SA-005342, *CY2016 APAP: Program Assessment of Issues Management: Parsons*, was conducted by OSQA and approved on November 22, 2016, was not transmitted to the contractor for action until July 2017. This and other contractor CAS-related assessments by OSQA were completed as scheduled, but were delayed in their transmittal to the contractor due to an administrative oversight. No other reports were found to be significantly delayed in this manner. SWPFPO created a new process (Procedure No.: SWPF-P-0028, *Notice of Concern Process*) in June 2017 to provide an additional avenue to formally document emergent day-to-day operational awareness issues to Parsons and provide SWPFPO with a tool for tracking responses.

Objective:

DOE field element line oversight program includes written plans and schedules for planned assessments, focus areas for operational oversight, and reviews of the contractor's self-assessment of processes and systems. (DOE Order 226.1B 4b(2))

The IPAM provides a comprehensive approach for scheduling and planning assessments for each calendar year (CY). OSQA works with line oversight organizations, identifies oversight trends through STAR trending analyses requiring additional oversight focus, and identifies assessment-related requirements to publish an APAP. The CY17 APAP issued in December 2016 to line oversight organizations for development of their organization-specific Annual Assessment Plan (AAP) provided direction on assessments in the areas of: WP&C, IH, Management Field Observations (MFO), CAS, trend analysis and focus areas such as effectiveness of corrective actions, recurring events, and hazardous energy control. For example, assessment 2016-SA-005342 evaluated Parsons' issue management effectiveness. The assessment was based on eight appropriate lines of inquiry, provided details on analysis techniques, and its nine findings and four opportunities for improvement were well-founded. An

assessment finding found inappropriate assignment of issues to lower significance categories and is in line with the deficiency noted in Section 7.1.

As line oversight organizations populate their AAP into the STAR system, the IPAM appropriately requires OSQA to roll up the AAPs into an Integrated Assessment Plan and provide tracking of the schedule in the STAR system. The SWPFPO *2017 SWPF Assessment Plan*, Revision 3, adequately implemented the CY 2017 APAP as well as appropriately incorporating oversight/assessment requirements from the *SWPF Certification and Verification Plan*, particularly those for component/system testing, commissioning, and readiness phases of the project. SWPFPO MRB records indicate that the AAP is actively managed and tracked. The assessment plan includes a line assessment of SWPF safety and health procedures in September 2017, which is particularly timely since Section 6.2 (of this assessment) notes that SWPF IH and occupational safety programs have not fully transitioned to effectively implement the Occupational Safety and Health Administration General Industry standards after the project construction phase was completed.

Objectives:

The DOE field element has implemented an effective FR program. (DOE Order 422.1)

Maintain sufficient technical capability and knowledge of site and contractor activities to make informed decisions about hazards, risks, and resource allocation; provide direction to contractors; and evaluate contractor performance. (DOE Order 226.1B)

DOE-SR has well-qualified and technically competent staff and management, and has implemented an effective FR program. Savannah River Implementing Procedure (SRIP) 400, Chapter 430.1, *Facility Representative Program*, is generally consistent with DOE-STD-1063-2011, *Facility Representatives*, and adequately describes their duties, responsibilities, and authorities. The DOE-SR Manager has chartered a Facility Representative Council (FRC) made up of all site FRs to strengthen DOE technical oversight of contractor activities. The FRC is a sounding board to ensure consistent approaches to oversight between organizations, (e.g., consistent application of occurrences reporting criteria and FR qualification requirements). In addition, the FRC is responsible for developing the quarterly DOE-SR *Facility Representative Program Performance Indicators* report and conducting the triennial FR program self-assessment. The FR program has been a proven source for filling current management positions. For example, the current directors of the Nuclear Material Operations Division, Assistant Manager for Nuclear Material Stabilization, and OSQA organizations were previously DOE-SR FRs.

SWPFPO currently meets the staffing plan with four FRs onboard. The lead FR is fully qualified, with years of relevant liquid waste and nuclear materials experience. Three new FRs have their core qualifications completed, and are on track to be fully qualified in August 2017. SWPFPO hired a former FR to provide mentoring and tutoring for the new FRs in preparation for their written exams and oral boards. The hiring and qualifications of the three new FRs shows good planning for providing robust operational awareness in preparation for testing systems and commissioning of the facility, as well as providing a future cadre of qualified FRs as the project moves through commissioning and into operations under oversight by the Assistant Manager for Waste Disposition. EA observed the SWPFPO lead FR perform routine duties and found the FR familiar with the facilities and process systems, and contractor management and staff. The FR was observant and followed up on important issues affecting safety (e.g., water on floor and markings for fall protection harnesses).

The DOE-SR technical qualification program (TQP) is sufficiently described in SRM 300.1.1B, Chapter 6, Section 6.1, *Human Capital Management Systems Manual, Technical Qualifications Program*. The program is administered by the Office of Environmental Management Human Resources Advisory Office

with advice and input from the highly experienced DOE-SR Federal Technical Capability Program Agent and the Chief Engineer. EA reviewed a sample of five TQP records for FRs and the Safety System Oversight (SSO) engineers and found them to be complete. OSQA SMEs providing programmatic oversight were currently qualified to their functional areas of responsibilities based on TQP records. TQP records also indicate that technical oversight personnel are supervised or managed by Senior Technical Safety Manager qualified individuals, as required. The TQP was last self-assessed in 2010; however, the SRM has been reviewed and updated within the last year. The TQP managers are aware of the need to conduct a self-assessment and stated that they are planning an assessment of the TQP later in 2017.

Criteria:

An effective differing professional opinion (DPO) process or program has been established and implemented. (DOE Order 442.2)

The DPO process is adequately documented in SRIP 400, Chapter 442.2, *Resolution of Differing Professional Opinions for Technical Issues Involving Environment, Safety and Health*. This procedure provides a choice for contractor and DOE-SR employees of going through the local DOE-SR DPO process or using the DOE Order 442.2 process. Email records show that employees are provided information on the use of the DPO. The DPO coordinator indicated that it is rare that employees utilize the DPO process, with no DPO cases submitted in the last two years. DPO is included in the General Employee Training received by employees.

An effective employee concerns program (ECP) has been established and implemented. (DOE Order 442.1A, CRAD 45-21)

The ECP is described in SRIP 400, Chapter 442.1, *DOE-SR Employee Concerns Program*. The designated DOE-SR ECP manager has received training and has over five years of experience with the ECP, and the Equal Employment Opportunity specialist is being cross-trained as the designated backup to the ECP manager. The ECP posters for DOE-SR, which are displayed on bulletin boards in Building 730B and at SWPF, inform employees of their right to submit concerns for investigation. Employee training on the ECP is included in conjunction with general employee training. In 2013, EA's predecessor organization conducted an Independent Oversight Review of the ECP that identified one finding (Finding 1) that stated DOE-SR has not implemented a fully effective ECP. DOE-SR has adequately addressed this finding. EA discussed several observations with the ECP manager regarding the ECP SRIP and ECP web page. An independent assessment of the ECP by the OSQA is now planned for August 2017.

SWPF workers submitted four employee concerns related to SWPF work activities in the last two years. Out of the four reports, the DOE-SR ECP manager determined that two were found to be outside of the ECP scope, a third was closed out as completed, and the fourth had been investigated and was awaiting final documentation for closure. DOE-SR has adequately addressed these concerns in a timely manner and provided effective communication with the concerned individuals. SWPFPO provided personnel to conduct technical investigations and provide the results to the ECP manager, and subsequently worked with the contractor regarding corrective actions. The cases were thoroughly investigated, and the associated case files were well documented.

An operating experience (OPEX) program has been developed and implemented, and an OE Program Coordinator has been designated. (DOE Order 210.2A 4a)

The OPEX program is described in SRIP 200, Chapter 210.2, *DOE-SR Operating Experience (OE) and Lessons Learned Program*, April 2011. Revisions to DOE Order 210.2A, *DOE Corporate Operating*

Experience Program, in April 2011 included significant changes to the DOE OPEX program and how DOE corporate OPEX documents are developed and applied across the DOE complex; however, the DOE-SR OPEX procedure revision has not implemented these substantive changes in the last six years. The OPEX coordinator has many years of experience in OPEX, but numerous other performance assurance duties significantly detract from her OPEX duties. In addition, the lessons learned database that had supported the OPEX program no longer functions, and no resources have been provided to support the development of another database. DOE-SR could not provide any documentation regarding lessons learned being developed by DOE-SR personnel, and there was no evidence that the OPEX coordinator was ensuring DOE lessons learned or corporate OPEX documents were being tracked to ensure the affected organizations have reviewed and taken any necessary actions. To provide FRs a source of OPEX information, the FRC ensured that each FR would receive lessons learned directly through the DOE OPEX distribution at a minimum. DOE-SR is not adequately developing, sharing, and implementing lessons learned through the OPEX program, as required by DOE Order 210.2A or SRIP 200, Chapter 210.2. (F-SR-01.)

8.0 FINDINGS

Findings are deficiencies that warrant a high level of attention from management. If left uncorrected, findings could adversely affect the DOE mission, the environment, the safety or health of workers and the public, or national security. DOE line management and/or contractor organizations must develop and implement corrective action plans for EA appraisal findings. Cognizant DOE managers must use site- and program-specific issues management processes and systems developed in accordance with DOE Order 227.1A to manage these corrective action plans and track them to completion. In addition to the findings, deficiencies that did not meet the criteria for a finding are listed in Appendix C, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

SWPF:

Finding F-SWPF-01: The governing documents for JHAs and test procedures, PP-SH-4407, Job Hazards Analysis, PP-CM-8102, *Startup Test Procedure Administration*, and DP-CM-8012, *Additional Guidance on SOT/ISOT Procedure Development*, do not provide adequate direction as to when to conduct a JHA and do not address the need to capture controls from the JHA in the test procedure. This is contrary to 10 CFR 851.21(a)(5) “Evaluate operations, procedures, and facilities to identify workplace hazards,” and 851.22(a)(1) “For hazards identified either in the facility design or during the development of procedures, controls must be incorporated in the appropriate facility design or procedure.” Parsons has not conducted a specific JHA for any of the SOTs, as required by the *SWPF 10 CFR 851 Worker Safety and Health Program*, Section 6.2.6 Job Activity-Level Hazard Analysis, which states that “JHAs will be conducted for all testing activities ... and will be initially conducted at the highest level for the work package.”

Finding F-SWPF-02: Parsons has not sufficiently assessed worker exposures to hazardous noise and does not have an auditable plan for establishing a high noise exposure baseline, as required by their procedure PP-SH-4440 and 10 CFR851.21 (1).

DOE-SR:

Finding F-SR-01: DOE-SR OPEX is not adequately developing, sharing, and implementing lessons learned through the OPEX program, as required by DOE Order 210.2A or SRIP 200, Chapter 210.2.

9.0 OPPORTUNITIES FOR IMPROVEMENT

EA identified an OFI to assist cognizant managers in improving programs and operations. While OFIs may identify potential solutions to findings and deficiencies identified in appraisal reports, they may also address other conditions observed during the appraisal process. EA offers this OFI only as a recommendation for line management consideration; it does not require formal resolution by management through a corrective action process and is not intended to be prescriptive or mandatory. Rather, it is a suggestion that may assist site management in implementing best practices or provide potential solutions to issues identified during the assessment.

Parsons:

OFI-SWPF-01: In planning for the transition from a project to an operational facility, consider implementing the following actions to better integrate SWPF with the liquid waste operations that are managed by SRR:

- Transition from the Maximo CMMS to the Asset Suite CMMS, including capturing work histories, post-job feedback, and other information that is useful for system health reports and reliability, availability, and maintainability.
- To minimize overscheduling of shared resources, work conflicts, lack of sufficient trained and qualified staff, etc., develop an integrated work planning schedule that includes all types of work and includes staffing needs and projected work-hours. Consider adopting the same scheduling system used by SRR.
- Adopt the STAR system for assessments and issues management for ease of transparency and coordination of corrective actions.

Appendix A Supplemental Information

Dates of Assessment

Onsite Assessment: July 10-14 and July 24-27, 2017

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, Acting 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
Kevin L. Dressman
Thomas R. Staker
William E. Miller
Michael A. Kilpatrick

EA Site Lead

Kevin M. Witt

EA Assessors

Jimmy B. Coaxum, Jr. – Lead
Nimalan Mahimaidoss
Terry E. Krietz
Terry B. Olberding

Appendix B
Key Documents Reviewed, Interviews, and Observations

DOE-SR

- DOE-SR *Organization Chart*, May 1, 2017
- OSQA *Organization Chart*, May 1, 2017
- SWPFPO *Organization Chart*, January 6, 2017
- SWPF *Readiness Oversight Integrated Project Team Organization Chart*, February 8, 2016
- SRM 226.1.1F, *Integrated Performance Assurance Manual*, Rev. F, September 7, 2016
- SRM 300.1.1B, Chapter 1, *Functions, Responsibilities, and Authorities Procedure (FRAP)*, Rev. 7, June 11, 2014
- SRM 300.1.1B, Chapter 6, Section 6.1, *Human Capital Management Systems Manual, Technical Qualifications Program*, Rev. 3, June 16, 2017
- SRM 400.1.1G, *Integrated Safety Management System Description Manual*, Rev. G, March 31, 2017
- SRIP 200, Chapter 210.2, *DOE-SR Operating Experience (OE) and Lessons Learned Program*, Rev.1, April 1, 2011
- SRIP 400, Chapter 421.2, *Safety System Oversight*, Rev. 3, July 28, 2016
- SRIP, Chapter 430.1, *Facility Representative Program*, Rev. 9, February 12, 2016
- SRIP 400, Chapter 442.1, *DOE-SR Employee Concerns Program*, Rev. 3, May 13, 2014
- SRIP 400, Chapter 442.2, *Resolution of Differing Professional Opinions for Technical Issues Involving Environment, Safety and Health*, Rev. 3, April 29, 2014
- Procedure No.: SWPF-P-0018, Rev. 3, *SWPF Certification and Verification Plan*, May 9, 2017
- Procedure No.: SWPF-P-0028, *Notice of Concern Process*, Rev. 0, June 28, 2017
- Charter, *Savannah River Operations Office Facility Representatives Council (FRC)*, Rev. 2, July 21, 2016
- *Self-Assessment of the Technical Qualification Program*, June 2010
- *TQP Stop Light Report*, June 30, 2017
- *Facility Representative Program Performance Indicators*, First Quarter CY2017
- *Triennial FR Assessment*, February 10, 2016
- *STAR Issue Log for 2015 FR Triennial Assessment Corrective Action Status*, printed July 11, 2017
- *OSQA TQP Listing*, July 12, 2017
- OSQA Memorandum from DOE-SR Manager to Distribution, subj: *DOE-SR Calendar Year (CY 2017) Annual Performance Assurance Plan*, December 6, 2016
- *CY2017 APAP*, December 6, 2016
- *OSQA SME 2017 Oversight Schedule*
- *Fiscal Year 2016 Integrated Safety Management System & Quality Assurance Effectiveness Declaration*
- *Executive Technical Management Board Agenda*, July 17, 2017
- TQP Qualification Cards for SWPFPO FR (two) and SSO
- Memorandum from DOE-SR Manager to Chairperson, Federal Technical Capability Panel, subj: *Annual Workforce Analysis and Staffing Plan Report for Calendar Year 2015*, January 29, 2016
- *STAR Assessment Report Search for OSQA Performance Assurance Division Assessments Related to "Issue Management"*, printed July 25, 2017
- Office of Health, Safety and Security Report, *Independent Oversight Review of the Employee Concerns Program at the Savannah River Operations Office*, July 2013
- Employee Concern Case File EC2016-03-02
- Employee Concern Case File EC2017-04-01
- Contractor Performance Assessment Report for SWPF Parsons for July 1, 2015 to June 29, 2016

- SWPF CY AAP, Rev. 3, May 1, 2017
- 2016-SA-005342, *CY16 APAP: Program Assessment of Issues Management: Parsons*, November 22, 2016
- 2016-SA-006376, *Integrated Safety Management System Annual Assessment*, January 5, 2017
- 2017-SA-005677, *Parsons' Contractor Assurance System Review*, April 19, 2017
- 2017-SA-001306, *Work Planning, Control and Scheduling*, February 2, 2017
- 2017-SA-002194, *SWPF Trend Analysis 4th Quarter CY2016*, May 22, 2017
- 2017-SA-003419, *SWPF Trend Analysis 1st Quarter CY2017*, Draft
- 2017-SA-003396, *MFO-Operational Awareness*, July 19, 2017
- *SWPF Management Review Board Agenda*, June 29, 2017
- *SWPF Management Review Board Agenda*, July 27, 2017 (with: four draft assessment reports; *Corrective Tracking System Log* dated July 26, 2017; and *SWPF MRB Tracking Log* dated July 27, 2017)
- *SWPF 2017 AAP Status Table*, as of June 26, 2017, and as of July 24, 2017
- SWPFPO Commissioning and Operation Division Daily Report, July 24 and 27, 2017
- SWPFPO FR OP-1, Daily Tour Guidance
- SWPFPO FR OP-1, Weekly Tour Guidance
- SWPFPO FR *Daily Activity Report*, June 12, 2017
- Memo from SWPFPO Commissioning and Operations Division to SWPF Operations Managers, *Subj: Assignment of the Department of Energy Duty Officers*, July 24, 2017
- Letter from SWPFPO Federal Project Director to Parsons SWPF Project Manager, *subj: Contract No. DE-AC09-02SR22210, Salt Waste Processing Facility Project: Event Notification Protocol Update*, Draft
- STAR Assessment Report for SWFPPO CY2017, printed July 11, 2017
- Notice of Concern Tracking Log, July 24, 2017
- SWPF Notice of Concern Tracking Number 2017-0005, July 19, 2017
- Parsons' Scheduled Work (POD handout) July 24, 2017
- SWPFPO IPT, *Test Support Team – Scoping Statement*

SWPF

- 2015-SR-SWPF-010, *Component Not Effectively Locked*, 11/16
- 2016-SR-SWPF-004, *Planning and Coordination are Essential to First Time Evolutions*, 03/16
- 2016-SR-SWPF-009, *Energized Temporary Power Cable Cut-Unexpected Discovery of Hazardous Energy*, 06/16
- 2017-SR-SWPF-016, *Proper Forklift Operation Must Be Observed at All Times*, 07/17
- Area Noise Data Excel spreadsheet
- CR-2017-290, *Glycol discharged during Plant Air Troubleshooting*
- DOE Guide 440.1-1B, *Worker Safety and Health Program for DOE*, 10/20/11
- DP-CM-8012, *Additional Guidance on SOT/ISOT Procedure Development*
- FF-2017-005, *Glycol discharged during Plant Air troubleshooting*, 06/17
- FF-2017-009, *Alpha Finishing Drain Tank Water Overflow Fact Finding Report*, 07/17
- Internal/External Assessment of Maintenance Work Practices, Policies, and Procedures 8/16
- JHA-2015-001, *Performing General Tours and Inspections*, R5
- JHA-2015-002, *Plant Air System*,
- JHA-2015-037, *Testing Rounds, Cold Weather Rounds, Temporary Tank Water Removal, Temporary Tank Farm Rounds, Plant Air Rounds*
- JHA-2016-001, *SOT and ISOT Performance*, R2

- JHA-2016-010, *Equipment Positioning, R2*
- JHA-2016-029, *Initial Air Systems Startup, R0*
- JHA-2016-031, *Startup of Electrical/Mechanical Systems, R0*
- JHA-2017-002, *Minor or Routine Maintenance, R0*
- JHA-WP-2000, *Common Construction JHA, R0, 04/16*
- JHA-WP-2071, *Erect Pre-Engineered Cover Structure, R0, 04/17*
- Lesson Learned ID: 2016-SR-SWPF-009 Energized Temporary Power Cable Cut-Unexpected Discovery of Hazardous Energy 6/16
- LL 2015-SR-SWPF-010, *Component Not Effectively Locked, 11/01/2016*
- LL 2016-SR-SWPF-004, *Planning and Coordination are Essential to First Time Evolutions, 03/01/2016*
- LL 2017-SR-SWPF-016, *Proper Forklift Operation Must Be Observed at All Times, 07/03/2017*
- Memo from Steve Hook, to Jerry Long, et al, subj: SWPF 2017 Drill Schedule, 02/17
- Metric and Trending Procedure and data for WP&C Safety, Conduct of Operations, Conduct of Maintenance (Last Three Years) February 2017
- MSA-16-03 SWPF Integrated Safety Management Effectiveness Review Fiscal Year 2016, 09/16
- OTWI-2017-116, *Starting Plant Air Compressors*
- OTWI-2017-146, *Starting Plant Air System, 06/17*
- OTWI-2017-149, *Systemization for Sample Pumps, Lab 002*
- P-EIP-J-00001, *Integrated Safety Management System (ISMS) Description*
- PL-AS-1001, *Salt Waste Processing Facility Integrated Assessment Program Plan, 10/15*
- PL-AS-1206, *SWPF Assurance Internal Independent Assessment Plan, Rev.1, 11/16*
- PL-CS-7204, *SWPF Construction Self-Assessment Plan for Fiscal Year 2017 10/16*
- PL-EN-5005, *SWPF Engineering CY 2017 Self-Assessment Plan, Rev. 8 3/17*
- PL-MN-8701, *Maintenance Trial Test Plan*
- PL-MN-8709, *SWPF Work Control Program Plan*
- PL-OP-8519, *SWPF Commissioning and Operations Annual Assessment Plan Rev. 4, 9/16*
- PL-QA-4701, *SWPF Annual Assessment Plan for Quality Assurance, Rev.4, 8/15/17*
- PL-SH-4306, *SWPF ESH Annual Internal Independent Assessment Plan, Rev. 3, 2/16*
- PL-SS-1617, *SWPF Safeguards and Security CY 2017 Self-Assessment Plan, Rev. 0, 6/17*
- PP-AS-1203, *Corrective Action Program.*
- PP-CM-8102, *Startup Test Procedure Administration*
- PP-CONOPS-07.3, *Fact Finding*
- PP-CS-7201, *Construction Work Control Process, R18, 02/17*
- PP-MN-8727, *Maintenance Work Scheduling, R2, 02/17*
- PP-MN-8740, *Maintenance Work Control*
- PP-OP-8523, *Operations Work Authorization and Release, R2, 06/17*
- PP-OP-8534, *Pre-Job Brief and Post Job Feedback, R1, 04/24/17*
- PP-QA-4701, *Surveillance Program 7/15*
- PP-QA-4701, *Surveillance Program, 10/14*
- PP-SH-4364, *Job Hazards Analysis, R6, 09/15*
- PP-SH-4365, *Safe Work Brief, R4, 06/16*
- PP-SH-4407, *Job Hazards Analysis*
- PP-SH-4440, *Occupational Noise Exposure Prevention and Control/Hearing Conservation, R0, 04/17*
- P-SD-J-00001, *SWPF Contractor Assurance System Description 5/16*
- Quality Assessment Report No. 100367 "P-102-2B Mechanical Seal Replacement 6/17
- RDS-TEST-001, *Testing Rounds, R5, 06/17*

- S-CIP-J-00003, *SWPF 10 CFR 851 Worker Safety and Health Program*
- SOP-AIR-001, *Plant Air System*, R4, 01/17
- SOT-BA-001, *Barium Decay*
- SOT-CWCR-001, *Control Room Chilled Water*
- SOT-DIW-001, *Deionized Water Package*
- SOT-LC-001, *Lab Collection System*
- SOT-PVV-001, *Process Vessel Ventilation*,
- SWFP-688, *One-Time Work Instructions*, R2
- SWPF-676, *Scheduled Work*, R4
- SWPF-759, *JHA checklist*
- SWPF-762, *Pre-Job Brief Checklist*, R0
- SWPF-763, *Post Job Feedback*, R0
- SWPF-CA-0018 *Root Cause Analysis Report Energized Temporary Power Cable Cut/ Unexpected Discovery of Hazardous Energy* 5/16
- SWPF-CA-0019 *Parsons' Root Cause Analysis Report "De-Energized Electrical Panel Entered without a Lockout Established"*
- SWPF-CA-0020 *Root Cause Analysis Report De-Energized Electrical Panel Entered without a Lockout Established* 6/16
- SWPF-MI-006, *FLT-222 Cross Flow Filter Housing Installation.*
- SWPF-MI-007, *FLT-222 Cross Flow Filter Housing Removal*
- SWPF-MI-008 *FLT-222 Tube Sheet Assembly Installation*
- SWPF-SR-3336, *2015 Self-Assessment Program Review* 9/15
- SWPF-SR-3336, *2015 Self-Assessment Program Review*
- SWPF-SR-3550, *2016 Self-Assessment Program Review* 9/16
- SWPF-SR-3623, *Assessment of SWPF-SM-007.1 Occupational Noise Exposure Prevention and Control/Hearing Conservation*, 12/16
- SWPF-SR-3725 *R1 Form SWPF-040, Rev.5 (PP-QA-4701) Parsons' Surveillance Report Instructions*
- SWPF-SR-3728 *Parsons' Surveillance Report* 5/17
- SWPF-SR-3728, *Salt Waste Processing Facility Contractor Assurance System*, 05/17
- SWPOG101.BR0100, *JHA Facilitator*
- SWPSGR01, *SWPF Basic Safety*
- V-IM-J-00001, *Project Organization, Roles, and Responsibilities Manual*
- V-RPT-J-00061, *Occurrence Reporting and Processing System Performance*
- V-RPT-J-00065 *SWPF Occurrence Reporting And Processing System Performance Analysis For second Quarter Fiscal Year 2017* 4/17
- WO 30452, *EXT-203A Contactor Removal and Replacement Maintenance Trial (SWPF-MI-001)*
- WO 30518, *ESV Replacement Maintenance Trial (HV-1215)*
- WO 32814 *JHA-2013, Safety Planner*, R1 07/17
- WO 33867, *Perform Thermocouple Maintenance Trial*
- WO-32814, *Install FLT-222A Filter Media*
- WP-2071, *TM-0020, Erect Pre-Engineered Cover Structure*, 04/17

Interviews

DOE-SR

Office of Safety and Quality Assurance Office Director
 Performance Assurance Division Director

WS&H Program SME
Infrastructure and Environmental Engineering (FTC Agent for DOE-SR)
EM Human Resources Advisor
FR Council Chair
ECP Manager
DPO/OEP/LL Coordinator
SWPFPO Federal Project Director
SWPFPO Commissioning and Operations Director
SWPFPO Engineering and Quality Assurance Director
SWPFPO FR
SWPFPO SSO
SWPFPO Engineer
SWPFPO STAR Coordinator
SWPFPO Contracting Specialist
SWPFPO IH (Integrated Project Team Member)

SWPF

Plant Manager and Deputy Manager
Commissioning and Test Manager
ESH Manager
Safety Manager
Construction Manager
Operations Manager and Deputy Manager
JHA facilitator
Work planners
Work Control Manager
Maintenance Manager
WP&C Procedure Writer/Coordinator
Lessons learned coordinator
Industrial Hygiene Manager
Lead Shift Operations Manager
Training Manager
QA Manager
Assurance Manager
Maintenance Oversight Lead
SWPF Assurance, Issue Coordinator

Observations

DOE-SR

SWPFPO FR Daily Oversight Activities
POD
SWPFPO Management Review Board
SWPF Tour

Parsons

ISOT/Operations – Testing Interface meeting

Tabletop for WO 33867, Perform Thermocouple Maintenance Trial
Five POD meetings
POW meeting
WO 32814, Install FLT-222A Filter Media, PJB and conduct of maintenance
SOT-BA-001, *Barium Decay*, PJB and test activities
SOT-PVV-001, *Process Vessel Ventilation*, PJB and Trouble Shoot and Repair
WO 33768, Calibration Check of Contactor Temperature Transmitters
Testing Operator Rounds
Fact-Finding for Spill
Fact-Finding Briefing to Maintenance staff
Shift Manager Turnover
Shift Manager Crew Briefing
Construction Work Package WP-2071, TM-0020, Erect Pre-Engineered Cover Structure
SWPF Tour
Test Status Meeting
Emergent Work Meeting

Appendix C Deficiencies

Deficiencies that did not meet the criteria for a finding are listed below, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

Parsons/SWPF

Work Planning and Control

- PP-MN-8740, *Maintenance Work Control*, does not include critical lifts as work that cannot be performed as minor maintenance/support activities. This does not meet SWPF-759, *JHA checklist*, which includes critical lifts due to the potential to exceed design limits.
- PP-CS-7201, *Construction Work Control Process*, allows the safety planner process to be used in lieu of revising JHAs, which does not meet step 2.2(2) of the same procedure. Step 2.2(2) states that JHAs are revised when the safety requirements change, work area conditions or hazards change, or the work scope changes and introduces new hazards.
- A JHA was not conducted for the three maintenance instructions associated with WO-32814, *Install FLT-222A Filter Media*, which provided the detailed instructions for performing the work. This does not meet the Parsons 10CFR851 Worker Safety and Health Program Description, which states that JHAs will be conducted for all testing activities (including maintenance work).
- Parsons did not document how the identified issues or concerns from the post-job feedback was assigned to the responsible manager for corrective actions as required by PP-OP-8534, *Pre-Job Brief and Post Job Feedback*.

Feedback and Improvement

- The significance levels of two findings from Assessment 2016-SA-005677, *Parsons Contractor Assurance System Review*, were incorrectly categorized. Due to the seriousness and breadth of the findings, a significance category of 2 should have been assigned, per PP-AS-1203, *Corrective Action Program*.