



Conduct of Operations Assessment at the Savannah River Site Salt Waste Processing Facility

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Acronyms

CFR	Code of Federal Regulations
ConOps	Conduct of Operations
CPLT	Complex Lockout/Tagout
DOE	U.S. Department of Energy
DOE-SR	DOE Savannah River Operations Office
EA	Office of Enterprise Assessments
FR	Facility Representative
ICD	Interface Control Document
IV	Independent Verification
LO/TO	Lockout/Tagout
OFI	Opportunity for Improvement
PA	Public Address
Parsons	Parsons Corporation
SPLT	Single Point Lockout/Tagout
SRIP	Savannah River Operations Office Implementing Procedure
SRR	Savannah River Remediation
SRS	Savannah River Site
SWPF	Salt Waste Processing Facility
SWPFPO	SWPF Project Office

**Conduct of Operations Assessment
at the Savannah River Site Salt Waste Processing Facility
March 4-7 and 25-28, 2019**

Summary

Scope:

This assessment evaluated the effectiveness and implementation of 13 elements of the Savannah River Site Salt Waste Processing Facility (SWPF) conduct of operations program. The elements, selected from U.S. Department of Energy (DOE) Order 422.1, *Conduct of Operation*, are:

- Shift Routines and Operating Practices
- Control Area Activities
- Communications
- Investigation of Abnormal Events, Conditions, and Trends
- Notifications
- Control of Equipment and System Status
- Lockout and Tagouts
- Independent Verification
- Logkeeping
- Turnover and Assumption of Responsibilities
- Control of Interrelated Processes
- Technical Procedures
- Component Labeling

This assessment also evaluated the DOE Savannah River Operations Office (DOE-SR) processes for conducting oversight of operational activities at SWPF. This assessment was conducted at the request of DOE-SR to help identify and resolve any significant issues prior to the upcoming operational readiness review.

Significant Results for Key Areas of Interest:

Conduct of Operations Program

Overall, for the elements assessed, Parsons Corporation has developed and implemented an effective conduct of operations program, including implementing procedures and processes, which meets the requirements of DOE Order 422.1. Weaknesses were identified in the areas of control of equipment and implementation of procedures. Parsons Corporation has acknowledged these issues for resolution.

Federal Oversight

DOE-SR is meeting the requirements of DOE Order 422.1 and has implemented an effective Facility Representative program for conducting oversight of operational activities at SWPF. DOE-SR actively and effectively conducts oversight of SWPF operational activities and provides the results to Parsons Corporation to improve safety and mission performance.

Best Practices and Findings

A Best Practice was identified regarding the use of an electronic watchbill system that verifies watchstanders are currently qualified for their assigned stations and automatically computes their proficiency hours for credit in the requalification program.

There were no Findings identified as part of this assessment.

Follow-up Actions:

No follow-up activities are planned.

Conduct of Operations Assessment at the Savannah River Site Salt Waste Processing Facility

1.0 PURPOSE

The U.S. Department of Energy (DOE) Office of Nuclear Safety and Environmental Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of the effectiveness of selected elements of the conduct of operations (ConOps) program at the Savannah River Site (SRS) Salt Waste Processing Facility (SWPF). The purpose of this assessment was to evaluate the performance of SWPF ConOps, as implemented by the facility contractor, Parsons Corporation (subsequently referred to as Parsons). This assessment was conducted on March 4-7 and 25-28, 2019.

2.0 SCOPE

EA assessed the effectiveness and implementation of selected elements of the SWPF ConOps program, processes, and procedures, in accordance with the requirements of DOE Order 422.1, *Conduct of Operations*. The selected elements for this assessment included all of the topics outlined in DOE Order 422.1 except for the sections on organization and administration, on-shift training, required reading, timely instructions/orders, and operator aids. EA also assessed the DOE Savannah River Operations Office (DOE-SR) processes for conducting oversight of operational activities at SWPF. This review scope was in accordance with the *Plan for the Office of Enterprise Assessments Assessment of Selected Conduct of Operations Processes at the Salt Waste Processing Facility, March 2019*.

3.0 BACKGROUND

SWPF is the key facility at SRS designed to process 90% of the liquid waste generated from Cold War weapons production efforts. The mission of SWPF will be to separate and concentrate the highly radioactive waste—mostly cesium, strontium, actinides, and waste slurry—from the less radioactive salt solution. After the initial separation processes are completed, the concentrated high-activity waste will be sent to the nearby Defense Waste Processing Facility, where it will be immobilized into glass and stored in vaults until it can be placed in a geologic repository. The decontaminated salt solution will be mixed with cement-like grout at the nearby Saltstone Facility for disposal on site.

SWPF construction has been completed, and systems have been through initial testing. Commissioning of SWPF plant systems with salt waste simulant is in process, which is expected to last through the first half of 2019. The current schedule for the start of full operations with the introduction of radioactive material is anticipated to be in December 2019. In order to support system testing and to prepare operators for the full operation of the facility, the control room is fully staffed on a 24/7 basis. Parsons is under contract to DOE to design, build, and commission SWPF, and subsequently operate the facility for one year.

4.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*. EA implements the independent oversight program through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. Organizations and programs within DOE use varying terms to document specific assessment results. In

this report, EA uses the terms “deficiencies, findings, and opportunities for improvement (OFIs)” as defined in DOE Order 227.1A. In accordance with DOE Order 227.1A, DOE line management and/or contractor organizations must develop and implement corrective action plans for any deficiencies identified as findings. Other important deficiencies not meeting the criteria for a finding are highlighted in the report and summarized 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 related to DOE Order 422.1, and the criteria and lines of inquiry presented in the following objectives from EA Criteria and Review Approach Document 30-02, *Review of Conduct of Operations Criteria Review and Approach Document*, Rev. 0, dated October 6, 2015:

- Objective 2.b. – Shift Routines and Operating Practices
- Objective 2.c. – Control Area Activities
- Objective 2.d. – Communications
- Objective 2.f. – Investigation of Abnormal Events, Conditions, and Trends
- Objective 2.g. – Notifications
- Objective 2.h. – Control of Equipment and System Status
- Objective 2.i. – Lockout and Tagouts
- Objective 2.j. – Independent Verification
- Objective 2.k. – Logkeeping
- Objective 2.l. – Turnover and Assumption of Responsibilities
- Objective 2.m. – Control of Interrelated Processes
- Objective 2.p. – Technical Procedures
- Objective 2.r. – Component Labeling

The assessment team examined key documents, including system descriptions, work packages, procedures, manuals, analyses, policies, and associated records; conducted interviews with key personnel responsible for developing and executing the associated programs; observed various operations and support activities; and walked down relevant 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.

Because SWPF is not yet operational, this is the first EA assessment of the SWPF ConOps program. Therefore, there were no items for follow-up during this assessment.

5.0 RESULTS

5.1 Shift Routines and Operating Practices

This section addresses the assessment of processes and procedures for shift routines and operating practices. DOE Order 422.1, Attachment 2, Section 2.b, *Shift Routines and Operating Practices*, provided the basis for this portion of the assessment.

Criterion:

The operator has established and implemented operations practices to ensure that shift operators are alert and informed of conditions and operate equipment properly. (DOE Order 422.1)

Shift routines and operating practices at SWPF are conducted in accordance with Parsons procedure PP-CONOPS-03.1, *Shift Routines and Operating Practices*, which adequately implements the relevant requirements from DOE Order 422.1. Specifically, PP-CONOPS-03.1 appropriately establishes requirements for safely performing operations, conducting operator rounds, authorizing equipment operation, resetting protective devices, and staffing facility positions.

PP-CONOPS-03.3, *Alarm Management*, appropriately addresses the response to alarms and defines the process for suppressing nuisance alarms due to malfunctioning equipment. The assessment team observed operators appropriately respond to a malfunctioning alarm related to ongoing testing by requesting and receiving permission from the shift operations manager to suppress the alarm.

SWPF uses an electronic watchbill system (dictating the operator by name who will staff each assigned position for the shift) that verifies that watchstanders are currently qualified for their assigned stations and automatically computes their proficiency hours for credit in the requalification program. This system, which has the same functionality as the Automated Qualification Matrix used by other SRS contractors, is cited as a **Best Practice**.

The assessment team observed operators performing routine facility rounds and other procedures involving equipment manipulation. PP-CONOPS-17.2, *Procedure Compliance*, appropriately requires the operator to verify that the correct revision of the procedure is being used, requires stepwise performance of procedures, and prescribes appropriate methods for placekeeping. Operators exhibited ownership of their facility spaces and demonstrated appropriate use of human performance improvement tools in the performance of rounds and procedures.

However, the assessment team observed several isolated non-compliances, including:

- Not wearing the proper personal protective equipment required by the job hazard analysis prior to tightening a coupling on a temporary hose line
- Breaking the plane of an area posted as a confined space
- Not verifying that fire doors latched after passing through them
- Not verifying that exterior fire doors were free of obstructions.

These non-compliances were brought to the attention of SWPF management, who appropriately initiated corrective actions.

Shift Routines and Operating Practices Conclusion

Overall, SWPF demonstrated adequate practices to ensure that operators are informed of conditions and operate equipment properly. The electronic watchbill system implements the best practice of precluding unqualified watchstanders while simultaneously updating proficiency hours.

5.2 Control Area Activities

This section addresses the assessment of processes and procedures for control area activities. DOE Order 422.1, Attachment 2, Section 2.c, *Control Area Activities*, provided the basis for this portion of the assessment.

Criterion:

Control areas properly function as the coordination point for important facility activities and operations. Operations practices in the control area are formal and conducted in a professional, business-like manner. (DOE Order 422.1)

Control area activities at SWPF are conducted in accordance with PP-CONOPS-04, *Control Area Activities*, which adequately implements the relevant requirements from DOE Order 422.1. The control room is accessed from the main corridor and has appropriate markings on the floor to delineate both the control area and the at-the-controls area. Access is appropriately controlled, with personnel requesting permission prior to entry. The assessment team observed denial of entry, which was necessary to complete in-progress tasks prior to addressing the lower priority request. Communications between operators and supervisors were appropriately professional and formal, with expected alarms due to testing being clearly annunciated and acknowledged.

However, during an emergency preparedness drill, the assessment team observed that alarms due to concurrent testing were not acknowledged and annunciated as promptly as they had been prior to the drill. The delay in acknowledging and annunciating the alarms was attributed to the divided attention of the control room operator, who was responsible for both role-playing during the drill as well as his assigned control station. SWPF management agreed to consider relieving drill participating operators with operators not participating in the drill, which is appropriate for the current state of operations at SWPF.

The assessment team observed that the facility status display, which provides a color-coded status of all major facility systems, would go dormant if the controls were not manipulated for a period of time. Once the display was dormant, the assigned facility status operator would need to re-enter his password to unlock the display. This display setting is due to computer security requirements intended to prevent unauthorized personnel from accessing information systems. Because the facility status operator is not an at-the-controls position requiring constant attendance, the assigned operator may be dispatched by the control room manager to perform other duties outside the control area. This absence can lead to a delay of several minutes before the facility status display is returned to use. SWPF management agreed that the current situation hinders the goal of keeping necessary personnel informed of facility status, and agreed to coordinate resolution of the issue with computer security personnel.

Control Area Activities Conclusion

Overall, control area activities are disciplined and professional. The facility status display has the potential to go dormant for a period of time until the assigned operator re-enters his password, which SWPF is taking action to resolve.

5.3 Communications

This section addresses the assessment of processes and procedures for communications. DOE Order 422.1, Attachment 2, Section 2.d, *Communications*, provided the basis for this portion of the assessment.

Criterion:

The operator has established and implemented operations practices that ensure accurate, unambiguous communications among operations personnel. (DOE Order 422.1)

Communications at SWPF are conducted in accordance with PP-CONOPS-05, *Communications*, which adequately implements the relevant requirements of DOE Order 422.1. The assessment team observed face-to-face communications during shift turnovers, field implementation of procedures, and emergency drills. For the most part, communications were clear and concise and followed the three-way communication protocol. The assessment team identified a few instances of communication missteps that were not corrected by the other individual engaged in the communication. In response, SWPF management reiterated its expectations for clear communications with operations staff. During start of watch meetings, each position appropriately acknowledged individual assignments and provided a concise status of equipment and evolutions for their watch station. During the conduct of field activities, SWPF operations staff were observed implementing radio communications with the control room using a dedicated channel and proper radio communication techniques.

The assessment team observed the use of the public address (PA) system in accordance with procedure requirements. Operators obtained permission from operations management prior to PA use and ensured that communications initiated over the PA system were repeated over radio to cover those areas where the PA system coverage was lacking. Some areas outside of SWPF, where PA announcements are inaudible, lacked proper signage indicating the need to use a backup communication mechanism such as radios, which was promptly resolved by SWPF management. The communication system used to conduct communications between emergency facilities, referred to as ring-down phones, was documented as being inoperable, and SWPF has implemented appropriate compensatory measures to address the problem.

Communications Conclusion

Overall, the implementation of communications is effective and in accordance with procedures. The use and testing of communication systems are appropriate. Minor issues were noted with inadequate PA system coverage postings and inoperable emergency communication systems, which SWPF is taking action to resolve.

5.4 Investigation of Abnormal Events, Conditions, and Trends

This section addresses the assessment of processes and procedures for investigating events to determine their impact and prevent recurrence. DOE Order 422.1, Attachment 2, Section 2.f, *Investigation of Abnormal Events, Conditions, and Trends*, provided the basis for this portion of the assessment.

Criterion:

The operator has established and implemented operations practices for investigating events to determine their impact and prevent recurrence. (DOE Order 422.1)

Investigations of abnormal events, conditions, and trends are conducted in accordance with SWPF procedure PP-CONOPS-07.1, *Investigation of Abnormal Events, Conditions, and Trends*, which adequately implements the relevant requirements of DOE Order 422.1. Several recently completed fact-findings and causal analyses of events were thorough, appropriate, and completed by qualified personnel. However, the corrective action system was not being fully utilized to prevent recurrence of minor operating events. For example, over the course of the assessment, a number of pump failures were observed and, although SWPF staff informally tracked these failures and had some understanding of the

causes, no condition reports had been generated. SWPF management agreed to consider whether there should be a lower threshold for entering issues into the corrective action system.

In accordance with the DOE Order 422.1 requirement to document periodic summaries of event analyses and trends, SWPF publishes a quarterly report titled, "Occurrence Report and Processing System Performance Analysis." One of the sections in this quarterly report is a watch list, which identifies events that are not sufficient to demonstrate a statistical trend or declare as a recurrent problem, but where continued similar performance might constitute a recurrent event in the future. The assessment team reviewed the previous four quarterly reports and identified multiple occurrences of events involving procedure compliance, procedural adequacy, and human performance. In each of these cases, the similarities of the causal factors for the events are acknowledged in the quarterly reports; however, the reports did not provide any analysis of the root causes for these issues. None of the multiple occurrences described in the previous four quarterly reports were included on the watch list because they did not meet the threshold for inclusion. The assessment team noted that the last time an item was placed on the watch list was in the fourth quarter of 2017. (See **OFI-Parsons-1**.)

Investigation of Abnormal Events, Conditions, and Trends Conclusion

Overall, this area is being implemented in accordance with the requirements of SWPF procedures. However, the organization's threshold for initiating condition reports and identifying trends is too high; as such, Parsons is missing opportunities to implement corrective actions to prevent recurrence.

5.5 Notifications

This section addresses the assessment of processes and procedures for notifications. DOE Order 422.1, Attachment 2, Section 2.g, *Notifications*, provided the basis for this portion of the assessment.

Criterion:

The operator has established and implemented operations practices to ensure appropriate event notification for timely response. In addition, the operator has integrated related requirements found in DOE Order 232.2 Admin Change 1, Occurrence Reporting and Processing of Operations Information, dated 8-30-11; DOE Order 151.1C, Comprehensive Emergency Management System, dated 11-2-05; DOE Order 470.4B Admin change 1, Safeguards and Security Program, dated 7-21-11; and DOE Order 205.1B Change 3, Department of Energy Cyber Security Program, dated 5-16-11, and applicable regulatory notification requirements. (DOE Order 422.1)

The process for event notifications is conducted in accordance with procedures PP-CONOPS-08, *Notifications*, and PP-CONOPS-07.2, *Occurrence Reporting*, which adequately implement the relevant requirements from DOE Order 422.1. The assessment team reviewed the operating logs for issues that might require a notification and found the logs to be sufficiently thorough in detailing occurrences during the operating shift. Issues that could have triggered a notification were reviewed against reporting criteria and were adequately evaluated. The SWPF coordinator for the Occurrence Reporting and Processing System demonstrated a thorough knowledge of the notification process. Additionally, SWPF operations supervisors undergo training on notification requirements, which provides a suitable level of information to enable them to carry out their duties. The assessment team also observed two emergency training drills involving SWPF operations staff; the objective of these drills was to evaluate the notification process. During the drills, the SWPF operations staff appropriately evaluated the situation and effectively carried out the process for making the requisite notifications.

Notifications Conclusion

Overall, the notification process is adequately implemented in accordance with procedures. SWPF operations staff are appropriately trained in the notification process, and drills showed that notifications can be effectively carried out when needed.

5.6 Control of Equipment and System Status

This section addresses the assessment of processes and procedures for control of equipment and system status. DOE Order 422.1, Attachment 2, Section 2.h, *Control of Equipment and System Status*, provided the basis for this portion of the assessment.

Criterion:

The operator has established and implemented operations practices for initial equipment lineups and subsequent changes to ensure facilities operate with known, proper configuration as designed. (DOE Order 422.1)

The process for control of equipment and system status is conducted in accordance with procedure PP-CONOPS-09.1, *Control of Equipment and System Status*, which adequately implements the relevant requirements from DOE Order 422.1. System status files reviewed by the assessment team were generally found to be effectively maintained, and included the most recent system alignments, forms documenting deviations, and any standard operating procedures that were paused or suspended without restoring the system to the baseline condition. However, during a walkdown of the safety significant air dilution system, the assessment team noted that the “back-up” flow indicators were valved in instead of the “primary” ones, even though the most recently completed system alignment showed that the “primary” ones were valved in, and no record of the status change was present in the system status file or on the facility status display. SWPF operations staff determined that the error in equipment status designation was due to a testing evolution that was paused. The assessment team noted that changes made to the status of a system undergoing testing were not required to be tracked either in the system status file or on the facility status display. SWPF management immediately implemented standing order SO-SWPF-2019-002, *Deviation Tracking during Test Instructions or Activities*, to ensure that deviations associated with testing were tracked and filed in the system status file if the testing was paused. Reviews of other systems showed that each system’s status file contained a completed full system alignment that had been appropriately reviewed by a supervisor and included independent verification (IV) as applicable.

SWPF uses condition tags to mark equipment that is in a deficient condition. The condition tags are logged in the Caution/Condition Tag log, including information about the condition requiring a tag and the accompanying service request. The log is adequately reviewed on a quarterly basis to confirm that the conditions are still in effect. The assessment team compared a sample of condition tags found in the plant to the log and verified that all tags in the plant had been logged, the conditions matched, and none of the conditions warranted a lockout/tagout (LO/TO) for personnel protection.

Temporary modifications are controlled in accordance with procedure PP-EN-5046, *Temporary Modifications*. This process appropriately requires the cognizant system engineer to design the temporary modification based on the input from the requestor using the design change notice process defined in PP-EN-5012, *Design Change Notices*. In general, temporary modifications were appropriately detailed, correctly installed, and correctly noted on associated engineering documents. However, the assessment team observed one temporary modification that was not installed in accordance with drawings. The temporary modification included a support stanchion for a pipe being used for chemical transfers. The support stanchion was not in contact with the floor, which disabled the function of the pipe support.

When brought to the attention of SWPF management, a service request was submitted that was subsequently documented as resolved. Upon follow-up, the assessment team observed that the pipe and support stanchion configuration was unchanged and still not in contact with the floor; this was determined to be the result of a miscommunication. SWPF management immediately engaged the engineering and maintenance organizations and implemented appropriate corrective actions. In this particular situation, the administrative controls for temporary modifications were not being properly followed. (**Deficiency**)

Control of Equipment and System Status Conclusion

Overall, SWPF has established and implemented appropriate operations practices for control of equipment and system status. Initial equipment lineups and subsequent changes are documented in system status files. Deficient equipment and temporary modifications are marked with the corresponding tags and logged, and quarterly surveillances on the logs are thorough. A deficiency was identified where administrative controls were not properly followed for a temporary modification.

5.7 Lockout and Tagouts

This section addresses the assessment of processes and procedures to implement the LO/TO program. DOE Order 422.1, Attachment 2, Section 2.i, *Lockout and Tagouts*, provided the basis for this portion of the assessment.

Criterion:

The operator has established and implemented operations practices for the installation and removal of lockout/tagouts for the protection of personnel. (DOE Order 422.1)

The process for installing and removing LO/TOs is conducted in accordance with procedure PP-CONOPS-10, *Lockout/Tagout Program*, which adequately implements the relevant requirements from DOE Order 422.1. PP-CONOPS-10 provides requirements for complex lockout/tagouts (CPLT), which require more than one isolation point, involve more than one type of hazardous energy, involve more than one work group, or involve other complicating factors. PP-CONOPS-10 also allows for a simplified process with the use of a single point lockout/tagout (SPLT) for certain situations.

The assessment team observed numerous evolutions with the installation and removal of CPLTs, including IV and a safe energy state determination, which is a check for hazardous energy performed by maintenance following LO/TO installation. The LO/TO activities were performed in a deliberate manner, with proper attention to detail. The installer or remover verified that the labeling on the valve or switch matched the danger tag and the description on the form. The steps of the installation and removal were followed in the order designated on the form. The safe energy state determination was appropriately tailored for the particular LO/TO installed in each case. All personnel interviewed and all involved with LO/TO understood the importance of correctly de-energizing equipment prior to work. The restoration positions for the components were determined by referencing the standard operating procedure lineup. Prior to authorizing LO/TO removal, the shift operations manager appropriately verified that the work was complete and that the workers properly signed the LO/TO. System restoration following LO/TO removal was completed using the standard operating procedure.

The assessment team also observed a work activity that required an SPLT. The shift personnel and the electricians installing the SPLT and performing the work understood the difference between an SPLT and a CPLT, and verified that the use of an SPLT was appropriate before installation. The SWPF operations staff discussed the proposed work with the electricians and reviewed the drawings of the affected equipment before writing the impact statement for the SPLT. In response to a request made by the shift

operations manager, the electricians used IV techniques when installing the SPLT as a precautionary measure, although IV is not required by procedure. When hanging the hasp and their locks, the electricians ensured that the locks did not impact other switches in the electrical panel. The electricians correctly performed a live-dead-live check to determine a safe energy state before beginning maintenance. Upon clearance of the SPLT, the electricians properly verified that the equipment was re-energized by checking indicating lights.

Lockout and Tagouts Conclusion

Overall, SWPF has established and implemented effective practices for LO/TO for the protection of personnel. Observed LO/TO activities were performed in accordance with established procedures, and personnel showed the appropriate attention to detail. All personnel interviewed that were involved with LO/TO understood the importance of correctly de-energizing equipment prior to work. Shift personnel and maintenance staff understood the difference between an SPLT and a CPLT, and verified that the use of an SPLT was appropriate before installation.

5.8 Independent Verification

This section addresses the assessment of processes and procedures for IV. DOE Order 422.1, Attachment 2, Section 2.j, *Independent Verification*, provided the basis for this portion of the assessment.

Criterion:

Independent Verification (IV) verifies that critical equipment configuration is maintained in accordance with controlling documents. (DOE Order 422.1)

The IV process is conducted in accordance with procedure PP-CONOPS-11, *Independent Verification*, which adequately implements the relevant requirements from DOE Order 422.1. PP-CONOPS-11 appropriately establishes and implements the situations and types of components requiring IV. For situations in which IV is not effective (e.g., torquing bolts), the procedure provides guidance for dual verification. Equipment positions requiring IV are appropriately identified in standard operating procedures. Verification techniques are listed in PP-CONOPS-11 Appendix A, *Independent Verification Techniques*, which covers a majority of the valves installed at SWPF. The assessment team identified two common types of valves at SWPF (air-operated valves and ball valves) that were not included in this procedure; SWPF management stated that both valve types will be included in the next revision.

The assessment team observed IV activities associated with LO/TO installation and removal. The operators involved with the IV activities understood and demonstrated compliance with the restrictions of time and distance. The operators performing the IV activities were thorough and verified that the component label and position matched the expected label and position indicated on the form. In one case where the form was unclear on the expected wording on the label, the individual conducting the IV appropriately sought clarification from a supervisor. In another instance, the individual conducting the IV was unsure of the correct way to verify the position of an air-operated valve, and correctly sought guidance from a supervisor prior to verifying the position of those types of valves.

Independent Verification Conclusion

Overall, SWPF uses IV to ensure that critical equipment configuration is maintained. Individuals observed performing IV activities were thorough and understood the restrictions of time and distance.

5.9 Logkeeping

This section addresses the assessment of processes and procedures for logkeeping. DOE Order 422.1, Attachment 2, Section 2.k, *Logkeeping*, provided the basis for this portion of the assessment.

Criterion:

The operator has established and implemented operations practices to ensure thorough, accurate, and timely recording of equipment information for performance analysis and trend detection. (DOE Order 422.1)

The process for logkeeping is conducted in accordance with PP-CONOPS-12, *Logkeeping*, which adequately implements the relevant requirements from DOE Order 422.1. Additionally, standing order SO-SWPF-2016-002, *Positions Requiring Turnover Checklists and Narrative Logs*, appropriately specifies which positions, by title, are required to maintain narrative logs. Facility round sheets also appropriately provide for narrative entries in addition to recording facility data.

Logs and round sheets were generally acceptable, with legible entries and proper techniques used for recording late entries and correction of entries. The assessment team noted some minor issues during a review of completed log and round sheet entries, including:

- One instance of a “Relieved by...” statement being omitted
- One instance of a “No further entries” statement being omitted
- Four instances of evidence of supervisory review being omitted.

In response to these issues, SWPF management reinforced logkeeping expectations with shift management.

PP-CONOPS-12 does not specify how long completed logbooks should be retained in the control room before transmittal to document control as required by DOE Order 422.1. After the assessment team noted this issue, SWPF management appropriately instituted 90-day local retention in a manner compliant with record retention requirements, and initiated a change to PP-CONOPS-12.

Logkeeping Conclusion

Overall, logkeeping at SWPF is performed in a manner that satisfactorily records events and equipment operation. Corrections are made appropriately, and supervisory reviews are performed and documented.

5.10 Turnover and Assumption of Responsibilities

This section addresses the assessment of processes and procedures for turnover and assumption of responsibilities. DOE Order 422.1, Attachment 2, Section 2.1, *Turnover and Assumption of Responsibilities*, provided the basis for this portion of the assessment.

Criterion:

The operator has established and implemented operations practices for thorough, accurate transfer of information and responsibilities at shift or operator relief to ensure continued safe operation. (DOE Order 422.1)

The process for turnover and assumption of responsibility is conducted in accordance with PP-CONOPS-13, *Turnover and Assumption of Responsibilities*, which adequately implements the relevant requirements from DOE Order 422.1. Positions requiring turnover are appropriately defined in SO-SWPF-2016-002. PP-CONOPS-13 appropriately defines the requirements for turnover of key positions, both for shift turnover and relief during a shift. However, PP-CONOPS-13 does not differentiate between the joint control area display walkdowns expected of different positions in the control room. In practice, the control room operators are expected to review their display screens, while other positions are expected to review the facility status display. SWPF management acknowledged this issue for potential inclusion in the next revision of the procedure.

Observations of shift turnovers showed effective transfer of equipment status from the offgoing shift to the oncoming shift. Activities in progress at the time of turnover were correctly transitioned, and the activities were recorded on the turnover sheets. All operators interviewed were familiar with the expectations for turning over activities in progress. The oncoming shift arrived early enough before the start of shift to allow time to complete the required logbook and other document reviews extending back to their last shifts, or 24 hours, whichever was shorter. The assessment team observed that many oncoming shift workers typically reviewed documents back to their last shifts, even following a seven-day break. In addition to document reviews, the staff turning over discussed the information contained in the turnover documentation and addressed any questions that arose. Turnover sheets reviewed by the assessment team contained the requisite information and were properly completed and signed.

Turnover and Assumption of Responsibilities Conclusion

Overall, SWPF has established and implemented operations practices for thorough, accurate transfer of information and responsibilities at shift turnover. Oncoming shift personnel begin turnover sufficiently early to allow for thorough review of logs and other documents. Activities in progress at the time of turnover were correctly transitioned. Turnover sheets were completed and signed, and appropriately covered necessary turnover information.

5.11 Control of Interrelated Processes

This section addresses the assessment of processes and procedures for control of interrelated processes. DOE Order 422.1, Attachment 2, Section 2.m, *Control of Interrelated Processes*, provided the basis for this portion of the assessment.

Criterion:

The Control of Interrelated Processes establishes operating practices to ensure that interrelated processes do not adversely affect safety or operations. Interrelated processes are processes or activities that can affect operations, but are under the control of persons other than the affected operators. (DOE Order 422.1)

The control of interrelated processes is conducted in accordance with PP-CONOPS-14, *Control of Interrelated Processes*, which adequately implements the relevant requirements from DOE Order 422.1. PP-CONOPS-14 identifies a series of agreements called Interface Control Documents (ICDs), primarily with Savannah River Remediation (SRR). V-ESR-J-00025, *Salt Waste Processing Facility Interface Management Plan*, describes how SWPF will utilize SRR's service-level agreements with other site contractors in order to obtain services from them.

The ICDs adequately address the responsibilities of each party to the agreement with respect to the control of interrelated processes, and also establish and implement lines of communication between

operating personnel and other interrelated process operators. However, the ICDs do not address required operator training and qualification to understand interrelated processes, in particular the impact of the interrelated process on all impacted facilities, as required by DOE Order 422.1. Examples of such impacts include:

- Activation of fire water pumps at the nearby Defense Waste Processing Facility when fire water is flowing at SWPF
- Shutdown of process air compressors at SWPF when domestic water is unavailable.

SWPF management has agreed to revise the ICDs to incorporate the interrelated process training requirements for both SWPF and SRR personnel.

Control of Interrelated Processes Conclusion

Overall, interrelated processes at SWPF are adequately controlled through a comprehensive set of ICDs. However, the ICDs need a revision to incorporate requirements for training of both SWPF and SRR personnel. SWPF management has agreed to initiate the required revisions.

5.12 Technical Procedures

This section addresses the assessment of processes and procedures for the development, maintenance, and use of technical procedures. DOE Order 422.1, Attachment 2, Section 2.p, *Technical Procedures*, provided the basis for this portion of the assessment.

Criterion:

The operator has established and implemented operations practices for developing and maintaining accurate, understandable written technical procedures that ensure safe and effective facility and equipment operation. (DOE Order 422.1)

The process for developing and maintaining operations procedures at SWPF is implemented in accordance with procedures PP-CONOPS-17.1, *Procedure Administration*, and PP-CONOPS-17.2, which adequately implement the relevant requirements from DOE Order 422.1. SWPF includes procedure writers on shift to allow for a quick and efficient response when initiating immediate procedure changes (IPCs). With the aid of on-shift procedure writers, operators were quick to request IPCs to improve the flow and accuracy of procedures. The assessment team observed operators stop when procedures needed correction, and IPCs were promptly initiated. SWPF operations staff were observed to appropriately use placekeeping techniques and other aspects of self-checking when implementing procedures both in the field and in the control room. Procedures in use were properly checked to ensure that they were the currently approved versions. The assessment team also noted that new emergency procedures were validated prior to implementation during emergency training drills.

The assessment team identified several discrepancies with the content of procedures resulting in implementation errors while observing SWPF operations staff conduct work activities. Examples include:

- An operator broke the plane of a confined space because the procedure told him to check for blockage on the inlet screen inside the cooling tower, which was inside the confined space.
- During cold weather conditions, an operator left hoses to an outdoor filter skid attached that were not drained. The procedure did not include a step to check outdoor temperatures after skid use.

- A tanker truck fill procedure provided confusing directions for establishing access boundaries to the transfer area and resulted in personnel entering the area unintentionally.
- A control room operator used an uncontrolled operator aid to configure a graph on the basic process control system because the procedure did not provide any guidance.
- The procedure for control room operator rounds on the caustic side solvent extraction process had a conditional limit that was not clear as to when a certain step should be performed.

In all cases listed above, SWPF operations staff implemented these procedures with these discrepancies in place. These issues were shared with SWPF management and corrective actions were promptly initiated. A commonality among these issues was that SWPF operations staff did not properly stop work and notify management when certain procedures could not be executed as written. (**Deficiency**)

Technical Procedures Conclusion

Overall, the development, maintenance, and use of technical procedures are following standards and expectations established in governing procedures. A deficiency was identified where SWPF operations staff did not properly stop work and notify management when certain procedures could not be executed as written.

5.13 Component Labeling

This section addresses the assessment of processes and procedures for component labeling. DOE Order 422.1, Attachment 2, Section 2.r, *Component Labeling*, provided the basis for this portion of the assessment.

Criterion:

The Component Labeling program ensures that labels are clear and accurate allowing operators and support personnel to quickly locate components. Component labels help ensure facility personnel are able to positively identify equipment they operate, thus reducing operator and maintenance errors. (DOE Order 422.1)

The process for component labeling is conducted in accordance with PP-CONOPS-19, *Component Labeling*, which adequately implements the relevant requirements from DOE Order 422.1. The SWPF Deputy Operations Manager is ultimately responsible for the component labeling program and works effectively with operations staff to ensure that procedural requirements are followed. Through multiple walkdowns of SWPF, the assessment team confirmed that the components that require a label were properly identified. Administrative control of component labels is effective in ensuring that lost or damaged labels are promptly identified and replaced, unauthorized or incorrect labels are prohibited, and temporary labels are properly controlled.

The component labeling program appropriately specifies the design and information to be included on component labels to uniquely identify components consistent with regulations, standards, and facility documents. One of the piping systems that is used for crossflow filter cleaning has a label name of "OXA," which is an abbreviation for oxalic acid. Discussions with SWPF operations staff indicate that this piping system will also be handling nitric acid. DOE Order 422.1, Attachment 2, Section 2.r.(2).e requires that piping labels indicate the fluid and normal flow direction. The DOE directive does not provide guidance for this situation where a piping system may be handling two different fluids. An analysis conducted by the SWPF engineering organization concluded that the piping could continue to be labeled as "OXA" as the SWPF design basis documents specify that "OXA" could mean either oxalic

acid or nitric acid. Discussions with field operators showed a common understanding of this piping system and the different types of fluids to be contained within.

Component Labeling Conclusion

Overall, the component labeling program at SWPF adequately ensures that labels are properly applied and maintained, which enables facility personnel to positively identify the equipment they operate.

5.14 DOE Field Element Oversight

This section discusses the assessment of DOE-SR processes for conducting oversight of operational activities at SWPF. DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, provided the basis for this portion of the assessment.

Criteria:

- *The 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))*
- *Oversight processes are tailored according to the effectiveness of the contractor assurance systems, the hazards at the site/activity, and the degree of risk, giving additional emphasis to potentially high consequence activities. (DOE Order 226.1B, 4b (5))*

The SWPF Project Office (SWPFPO) in DOE-SR provides leadership, direction, contract management, and oversight for all aspects of SWPF. Because SWPF will soon start full operations, DOE-SR has implemented a transition plan for the transfer of oversight responsibilities to DOE-SR's existing line management for liquid waste operations. The transition is planned to be complete by the end of 2019, and one of the near-term steps is transferring the chain of command for the Facility Representatives (FRs) from SWPFPO to the DOE-SR Assistant Manager for Waste Disposition. The transition plan provides guidance and establishes standards and expectations that help ensure that lines of responsibility, relevant authorities, and appropriate accountabilities will continue to be maintained in accordance with DOE Policy 450.4A, *Integrated Safety Management Policy*.

In accordance with DOE Order 422.1, SWPFPO has implemented an effective FR program to provide SWPFPO and DOE-SR line managers with accurate, objective information on the effectiveness of contractor work performance and practices. Savannah River Operations Office Implementing Procedure (SRIP) 430.1, *Facility Representative Program*, describes the site-level requirements for FR duties, authorities, and responsibilities. SWPFPO has assigned four full-time individuals as FRs at SWPF, which adequately meets their staffing needs. The qualification process for FRs follows the applicable DOE requirements, resulting in technically competent FRs who are able to effectively carry out their oversight responsibilities. The FRs main responsibility is to conduct broad-based observation and assessment of SWPF operations and activities that are considered important to maintaining the safety of workers and the public. SRIP 430.1 provides requirements for FRs, such as keeping a record of their activities and observations, preparing daily reports, and communicating any safety or operational concerns to SWPF and SWPFPO management. The assessment team reviewed several examples of FR oversight records and found them to be appropriately detailed.

DOE-SR oversight of operational activities at SWPF is further augmented by support contractor personnel. Two contractor subject matter experts, who have substantial experience and knowledge in ConOps, conduct detailed assessments of SWPF ConOps elements. As an example of the added value

they provide, DOE-SR recently conducted an assessment of the SWPF component labeling program and physically verified that 2,420 components had labels that were properly applied. This DOE-SR assessment found only 16 discrepancies, which is an error rate of 0.7%, all of which were promptly remediated. This DOE-SR assessment, along with others, indicates that DOE-SR is conducting very detailed evaluations of SWPF operational programs.

DOE Field Element Oversight Conclusion

Overall, DOE-SR is meeting the requirements of DOE Order 422.1 and has implemented an effective FR program for conducting oversight of operational activities at SWPF. DOE-SR actively and effectively conducts oversight of SWPF operational activities and provides the results to SWPF management to improve safety and mission performance.

6.0 FINDINGS

The assessment team did not identify any findings during this assessment.

7.0 OPPORTUNITIES FOR IMPROVEMENT

The assessment team 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 these OFIs only as recommendations for line management consideration; they do not require formal resolution by management through a corrective action process and are not intended to be prescriptive or mandatory. Rather, they are suggestions that may assist site management in implementing best practices or provide potential solutions to issues identified during the assessment.

Parsons Corporation

OFI-Parsons-1: Consider lowering the threshold for placing items on the watch list in the “Occurrence Report and Processing System Performance Analysis” quarterly report to allow for a full consideration of issues that might have an impact on safety and performance.

Appendix A Supplemental Information

Dates of Assessment

Onsite Assessment: March 4-7 and March 25-28, 2019

Office of Enterprise Assessments (EA) Management

Nathan H. Martin, Director, Office of Enterprise Assessments
April G. Stephenson, Deputy Director, Office of Enterprise Assessments
Thomas R. Staker, Director, Office of Environment, Safety and Health Assessments
C.E. (Gene) Carpenter, Jr., Director, Office of Nuclear Safety and Environmental Assessments
Kevin G. Kilp, Director, Office of Worker Safety and Health Assessments
Gerald M. McAteer, Director, Office of Emergency Management Assessments

Quality Review Board

Steven C. Simonson
Michael A. Kilpatrick

EA Site Lead for Savannah River Site

Kevin M. Witt

EA Assessors

Kevin M. Witt – Lead
Frank A. Inzirillo
Sarah C. Rich
Gregory D. Teese

Appendix B

Key Documents Reviewed, Interviews, and Observations

Documents Reviewed

- FF-2018-5, CR-2018-191, *Potential Worker Exposure to Hazardous Energy*
- FF-2018-2, CR-2018-96, *Valve HC_7214 Inadequate Hazardous Energy Lockout/Tagout*
- CPLT-2019-090, *Troubleshoot and Repair P-204A*, prepared 2/27/2019
- CPLT-2019-097, *Repair PIV-76*, prepared 3/5/2019
- CPLT-2019-098, *Repair PIV-76*, prepared 3/6/2019
- DCN 5135, *TM-0053/RPS-00 Delay Installation of Radiation Instruments Associated with SOT-RMS-001*, Revision 0, 8/11/2016
- DCN 5150, *TM-0020/Electrical Work Temp. Tank Farm and Tie-Ins for Cold Commissioning*, Revision 5, 9/19/2018
- DCN 5177, *TM-0078/Delayed Interlock for PI-2621 and PI-2627*, Revision 0, 3/8/2018
- DCN 5183, *TM-0084/Startup Strainers for NGS Pumps*, Revision 1, 8/9/2018
- DCN 5191, *TM-0091 Alternate Valve and Controller for FV-2248*, Revision 3, 2/25/2019
- DCN 5192, *TM-0093/Disconnect ANN-001*, Revision 0, 3/20/2019
- DI-OP-11, *ORPS Quarterly Report and Watch List*, Revision 3, 3/5/2018
- FF-2018-006, rev. 1, *Near Miss-Charged Fire Hose Flexing*, 9/13/2018
- FF-2018-007, rev. 0, *Backhoe Contact Cathode Protection Box*, 10/15/2018
- FF-2019-001, rev. 0, *CONOPS Issue - Wrong tank selected during transfer*, 01/14/2019
- FF-2019-002, rev. 0, *Shock From Laboratory Equipment*, 1/29/2019
- FF-2019-003, rev. 0, *Temporary Tank Farm Valves Out of Position*, 2/19/2019
- JHA-2017-005, *Temporary Tank Farm Simulant Reconstitution*, Revision 2, 12/14/2017
- M-M6-J-0043, Sht 03, *SWPF Process Building Caustic Wash Pumps P-204A/B P&ID*, Revision 11, 7/13/2018
- M-M6-J-0046, Sht 02, *SWPF Process Building Solvent Feed Pumps P-202A/B P&ID*, Revision 15, 11/16/2018
- M-M6-J-0047, Sht 03, *SWPF Process Building Ba-137 Decay Tank Pumps P-206A/B P&ID*, Revision 12, 11/16/2018
- M-M6-J-0064, Sht 02, *SWPF Process Building CSSX Pump Drain Header P&ID*, Revision 6, 7/16/2015
- M-M6-J-0120, Sht 01, *SWPF Process Building Solvent Drain Tank Tk-208 P&ID*, Revision 12, 10/17/2018
- M-M6-J-0126, Sht 01, *SWPF Process Building West CSSX Tank Cell Sump P&ID*, Revision 13, 3/28/2016
- M-M6-J-0167, Sht 03, *SWPF Process Building Seal Flush Plan 53A Detail 2 P&ID*, Revision 11, 10/2/2018
- M-M6-J-0170, Sht 01, *SWPF Process Building Solvent Feed Coolers Hx-202A/B P&ID*, Revision 10, 8/17/2016
- MSA-18-04, *Configuration Management Effectiveness Management Self-Assessment*, Revision 0, 1/15/2019
- Memorandum of Understanding between Salt Waste Processing Facility Project Office and Office of the Assistant Manager for Waste Disposition for Transfer of Oversight Responsibilities for the Salt Waste Processing Facility, 4/18/2019
- OPSINSP-SWPF-003, Revision 2, *SWPF Seasonal Facility Preservation*, 2/11/2019
- ORPS Report EM-SR-PSC-SWPF-2019-001, *Shock from Laboratory Equipment*, 1/28/2019
- ORPS Report EM-SR-PSC-SWPF-2019-002, *Management Concern-Packaging and Transportation*, 2/25/2019

- ORPS Report EM-SR-PSC-SWPF-2018-003, *Near Miss-Charged Fire Hose Flexing*, 9/5/2018
- PCAR-CO-002, *Programmatic Compliance Assessment Report DOE O 422.1 Adm Chg 2*, Revision 1, 1/28/2019
- PL-MN-8705, *Salt Waste Processing Facility Electrical Safety Program Plan*, Revision 3, 5/4/2016
- PL-OP-8503, *Salt Waste Processing Facility Conduct of Operations Implementation Plan*, Revision 4, 9/12/2018
- PL-TR-1801, *Salt Waste Processing Facility Personnel Selection, Training, and Qualification Plan*, Revision 13, 8/7/2018
- PM-OP-8501, *Salt Waste Processing Facility Operations Safety Manual*, Revision 1, 5/23/2017
- PP-AS-1203, *Corrective Action Program*, Revision 13, 5/8/2018
- PP-CONOPS-03.1, *Shift Routines and Operating Practices*, Revision 3, 2/7/19
- PP-CONOPS-03.3, *Alarm Management*, Revision 0, 8/17/2017
- PP-CONOPS-04, *Control Area Activities*, Revision 3, 12/11/2018
- PP-CONOPS-05, *Communications*, Revision 2, 11/29/18
- PP-CONOPS-07.1, *Investigation of Abnormal Events, Conditions, and Trends*, Revision 1, 9/27/2018
- PP-CONOPS-07.2, *Occurrence Reporting*, Revision 1, 10/2/2017
- PP-CONOPS-07.3, *Fact Finding*, Revision 3, 5/25/2018
- PP-CONOPS-07.4, *Investigations*, Revision 1, 1/17/2018
- PP-CONOPS-08, *Notifications*, Revision 3, 4/23/2018
- PP-CONOPS-09.1, *Control of Equipment and System Status*, Revision 4, 10/10/2018
- PP-CONOPS-09.2, *Administrative Lock Program*, Revision 4, 3/12/2018
- PP-CONOPS-09.3, *Use and Control of Caution Tags and Condition Tags*, Revision 0, 4/28/2017
- PP-CONOPS-10, *Lockout/Tagout Program*, Revision 4, 1/22/2019
- PP-CONOPS-11, *Independent Verification*, Revision 0, 4/28/2017
- PP-CONOPS-12, *Logkeeping*, Revision 1, IPC-1, 7/27/2018
- PP-CONOPS-13, *Turnover and Assumption of Responsibilities*, Revision 0, 4/28/2017
- PP-CONOPS-14, *Control of Interrelated Processes*, Revision 1, 4/11/2018
- PP-CONOPS-14, *Control of Interrelated Processes*, Revision 2, 2/27/2019
- PP-CONOPS-16, *Timely Instructions/Orders*, Revision 2, 1/15/2019
- PP-CONOPS-17.1, *Procedure Administration*, Revision 1, 8/8/2017
- PP-CONOPS-17.2, *Procedure Compliance*, Revision 2, 1/22/2019
- PP-CONOPS-16, *Timely Instructions/Orders*, Revision 2, 1/15/2019
- PP-CONOPS-19, *Component Labeling*, Revision 2, 8/16/2017
- PP-DC-3001, *Document Control*, Revision 13, 11/9/2018
- PP-DC-3012, *Document/Administrative Procedure Preparation and Review*, Revision 9, 8/31/2017
- PP-EN-5012, *Design Change Notices*, Revision 25, 12/4/2018
- PP-EN-5046, *Temporary Modifications*, Revision 1, 6/19/2018
- PP-OP-8523, *Work Authorization and Release*, Revision 7, 3/20/2018
- PP-OP-8530, *Management Field Observations*, Revision 1, 4/24/2017
- PP-OP-8537, *Entry Into and Exiting From Limiting Condition for Operation*, Revision 2, 2/5/2019
- PP-SH-4413, *Barricades, Signs, Tags, and Color Codes*, Revision 0, 4/25/2017
- RDS-BOP-001, *Salt Waste Processing Facility BOP Operator Rounds*, Revision 4, IPC-1, 12/27/2018
- RDS-BOP-001, *Salt Waste Processing Facility BOP Operator Rounds*, Revision 4, IPC-2, 2/21/2019
- RDS-CCAAFF-001, *Salt Waste Processing Facility CCA/AFF Operator Rounds*, Revision 2, IPC-4, 12/28/2018
- RDS-CPA-001, *Salt Waste Processing Facility CPA Operator Rounds*, Revision 2, 10/22/2018

- RDS-CROASP-001, *Salt Waste Processing Facility Alpha Strike Process and Alpha Finishing Facility Control Room Rounds*, Revision 1, IPC-3, 12/26/2018
- RDS-CROBOP-001, *Salt Waste Processing Facility Balance of Plant Control Room Rounds*, Revision 0, IPC-5, 2/24/2019
- RDS-CROCSSX-001, *Salt Waste Processing Facility Caustic-Side Solvent Extraction Control Room Rounds*, Revision 1, 12/17/2018
- RDS-SUP-001, *Salt Waste Processing Facility Supplemental Rounds*, Revision 0, IPC-1, 6/11/2018
- SO-SWPF-2016-002, *Positions Requiring Turnover Checklists and Narrative Logs*, Revision 6, 11/2/2018
- SO-SWPF-2019-002, *Deviation Tracking during Test Instructions or Activities*, Revision 0, 3/22/2019
- SOP-ADS-001, *Air Dilution System*, Revision 4, 11/1/2018
- SOP-CSSX-001, *Caustic-Side Solvent Extraction Process*, Revision 5, 11/5/2018
- SOP-PSL-001, *Pump Seal System*, Revision 5, 12/10/2018
- SOP-TTFO-001-2.1, *Reconstitution of Simulant in TK-RECON-1*, Revision 7, 3/26/2019
- SOP-TTFO-001-4.20, *Transferring Wash Water Hold Tank (WWHT) TK-105 to Chemical Tanker*, Revision 5, IPC-1, 2/20/2019
- SPD-SWPF-0196, *Salt Waste Processing Facility Project Memorandum of Agreement Regarding SRS Interfaces Pertaining to the Salt Waste Processing Facility Design, Construction, and Operation in J-Area*, Revision 1, 9/28/2010
- S-SAR-J-00002, *Salt Waste Processing Facility Documented Safety Analysis*, Revision 0, 10/4/2018
- S-TSR-J-00001, *Salt Waste Processing Facility Technical Safety Requirements*, Revision 0, 10/4/2018
- SRIP 430.1, *Facility Representative Program*, Revision 10, 2/27/2018
- SWPF-CONOPS-MATRIX-001, *Conduct of Operations Matrix for DOE O 422.1*, Revision 1, 8/17/2018
- SWPF-FMSA-0065, *Logkeeping*, Revision 0, 10/3/2018
- SWPF-FMSA-0067, *PP-CONOPS-4 Control Area Activities*, Revision 0, 10/3/2018
- SWPF-FMSA-0074, *PP-CONOPS-04[sic] Control of Interrelated Processes*, Revision 0, 10/12/2018
- SWPF-FMSA-0082, *PP-CONOPS-03.1 Shift Routines and Operating Practices*, Revision 0, 11/8/2018
- SWPF-FMSA-0088, *Monthly Complex LO/TO Audit per PP-CONOPS-10*, 10/26/2018
- SWPF-FMSA-0098, *Monthly Complex Lockout Tagout Surveillance per PP-CONOPS-10*, 11/10/2018
- SWPF-FMSA-0099, *Lockout/Tagout Program Monthly Surveillance per PP-CONOPS-10*, 11/26/2018
- SWPF-FMSA-0111, *Monthly Complex Lockout Tagout Surveillance per PP-CONOPS-10*, 12/25/2018
- SWPF-SR-4125, *Conduct of Operations PP-CONOPS-14 Control of Interrelated Processes*, Revision 0, 4/26/2018
- Temporary Modification 0020, DCN 5149
- Turnover Checklists for 3/1/2019 – 3/5/2019, and 3/26/2019
- V-ESR-J-00001, *Salt Waste Processing Facility Interface Control Document List*, Revision 2, 11/8/2018
- V-ESR-J-00002, *Salt Waste Processing Facility Domestic Water System Interface Control Document (ICD-02)*, Revision 4, 11/8/2018
- V-ESR-J-00008, *Salt Waste Processing Facility Project Electrical Power Distribution Interface Control Document (ICD-08)*, Revision 5, 11/17/2010

- V-ESR-J-00010, *Salt Waste Processing Facility Waste Transfer Interface Control Document (ICD-10)*, Revision 7, 10/10/2018
- V-ESR-J-00013, *Salt Waste Processing Facility Telecommunications and Controls Datalink System Interface Control Document (ICD-13)*, Revision 4, 5/15/2017
- V-ESR-J-00017, *Salt Waste Processing Facility Project Fire Protection Water System Interface Control Document (ICD-17)*, Revision 4, 10/23/2013
- V-ESR-J-00025, *Salt Waste Processing Facility Interface Management Plan*, Revision 2, 7/30/2018
- V-RPT-J-00067, rev 0, *SWPF Occurrence Reporting and Processing System Performance Analysis For 4QFY17*, 10/25/2017
- V-RPT-J-00068, rev 0, *SWPF Occurrence Reporting and Processing System Performance Analysis For 1QFY18*, 1/25/2018
- V-RPT-J-00069, rev 0, *SWPF Occurrence Reporting and Processing System Performance Analysis For 2QFY18*, 4/20/2018
- V-RPT-J-00070, rev 0, *SWPF Occurrence Reporting and Processing System Performance Analysis For 3QFY18*, 7/24/2018
- V-RPT-J-00071, rev 0, *SWPF Occurrence Reporting and Processing System Performance Analysis For 4QFY18*, 10/23/2018
- V-RPT-J-00072, rev 0, *SWPF Occurrence Reporting and Processing System Performance Analysis For 1QFY19*, 2/5/2019
- V-SCD-J-00002, *Salt Waste Processing Facility Procedure Writer's Guide*, Revision 3, 2/11/2019
- WO-41509, *TS/R CP-HTR-301B Control Circuit Light, R150E*, completed 3/25/2019
- X-WCP-H-00029, *Waste Compliance Plan for Tank Farm Transfers to the Salt Waste Processing Facility*, Revision 2, 10/2015
- X-SD-G-00009, *Waste Acceptance Criteria for Liquid Waste Transfers to the Tank Farms*, Revision 0, 1/2013
- X-SD-S-00001, *Waste Acceptance Criteria for Raw Salt Solution, Sludge and SWPF Salt Streams Transfers to DWPF*, Revision 0, 1/2013
- X-SD-Z-00004, *Waste Acceptance Criteria for Transfers to the Z-Area Saltstone Production Facility During Salt Disposition Integration (SDI)*, Revision 0, 1/2013
- X-WCP-J-00001, *Salt Waste Processing Facility Project SWPF Waste Compliance Plan for Decontaminated Salt Solution Transfers to Tank 50*, Revision 4, 12/5/2013
- X-WCP-J-00002, *Salt Waste Processing Facility Project SWPF Waste Compliance Plan for Transfers to the Defense Waste Processing Facility*, Revision 0, 3/27/2014

Interviews

Parsons

- Senior Vice President and Project Manager
- Plant Manager
- Deputy Plant Manager
- Operations Manager
- Deputy Operations Manager
- ES&H Manager
- ES&H Senior Advisor
- Procedure Support Manager
- Engineering Manager
- Assurance Manager
- ConOps Mentor (2)
- Shift Technical Engineers (3)
- Shift Operations Managers (3)

- Control Room Manager
- Control Room Operators (5)
- Operations Field Supervisor
- Field Operators (4)
- Electricians (2)
- Shift Clerk
- Document Coordinator

DOE-SR

- Federal Project Director
- Deputy Federal Project Director
- Assistant Manager for Waste Disposition
- Acting Director of Commissioning and Operations
- Facility Representatives (4)
- Chief Engineer

Observations

- Plan-of-the-Day Meeting
- Plant Manager's Start-of-Day Shift Meeting (2)
- Day Shift Start-of-Watch Meeting (3)
- Night Shift Start-of-Watch Meeting (2)
- Shift Technical Engineer Turnover (2)
- Shift Operations Manager Turnover (4)
- Control Room Operator Turnover (2)
- Pre-job briefs (3)
- Operator rounds (3)
- Complex LO/TO installation
- Complex LO/TO removal (2)
- Independent verification activities (3)
- Safe energy verification
- Single point LO/TO installation, safe energy verification, and removal
- Post-maintenance Test
- Cold weather procedure implementation
- Emergency preparedness drills (2)
- Transfer of wash water hold tank to chemical trailer
- Transfer of liquids between tanks
- Walkdown of air dilution system
- Walkdown of caustic-side solvent extraction system
- Walkdown of monosodium titanate drum unloading
- Walkdown of simulant reconstitution
- Shift briefing

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.

- Contrary to the requirements of DOE Order 422.1, Attachment 2, Section 2.h.(7).c, administrative controls were not properly followed for a temporary modification. (See Section 5.6.)
- Contrary to the requirements of DOE Order 422.1, Attachment 2, Section 2.p.(1).a, there were several instances where operators did not stop work and notify management when procedures could not be executed as written. (See Section 5.12.)