Salt Waste Processing Facility Project
Status and Path Forward
SC Governor’s Nuclear Advisory Council
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SWPF Project Overview
This critical facility will:

- Reduce radioactive waste volume requiring vitrification,
- Utilize the same actinide and cesium removal unit processes as Interim Salt Processing Facilities (ARP/MCU),
- Process over 90% of Tank Farm liquid radioactive waste (~100 Mgal after dissolution), and
- Have a nominal capacity of 6 – 8 Mgal/year.
SWPF Role in SRS Liquid Waste System

- Designed to process more than 6 million gallons per year
- Cs decontamination factor > 40,000
- Technology very mature
- No open DNFSB issues
SWPF Project Milestones

DESIGN PHASE - CONCEPTUAL THRU FINAL

CONSTRUCTION

TODAY – April 2015

TARGET FACILITY OPERATION (CD-4)
12/3/2018

CONSTRUCTION COMPLETE
12/31/2016

HOT COMMISSIONING

ONE YEAR OPERATIONS

CONTINUED OPERATIONS
10-15 Years

CD-3B, 1/2/2009

CD-0, SEP 2002
9/2/2002

CD-1, MAR 2004
3/31/2004

CD-2/3A
9/24/2007

COMMISSIONING


Safety ♦ Quality ♦ Schedule ♦ Cost ♦ Customer Satisfaction
SWPF Project Status
Parsons is the contractor for the Salt Waste Processing Facility (SWPF) project [*design, construction, commissioning, and operate for one year*].

Safety of our workforce is Parsons number 1 priority.

Construction is approximately 83% complete and commissioning is approximately 14% complete. Overlapping the commissioning phase with construction has been beneficial with focus on ultimate start-up of the facility.

Integrated baseline through CD-4 provisionally approved by DOE. Independent Baseline Review successfully completed in February 2015.
SWPF Process Overview

- **F and H Area Tank Farms**
  - Qualified Waste Batch
  - Alpha Strike Process
  - Cesium Removal Process
  - Alpha Finishing Process
  - SWPF
    - Cs Enriched Strip Effluent
    - Decontaminated Salt Solution
    - Saltstone Facility
  - Concentrated Sr-90/Actinides Sludge
  - Concentrated Sr-90/Actinides Sludge

*Safety ◆ Quality ◆ Schedule ◆ Cost ◆ Customer Satisfaction*
SWPF Process Status: Safety

- Full scale/large scale Air Pulse Agitator testing demonstrated safe and effective operational performance
- DNFSB closed all SWPF mixing questions in Dec 2013 report to Congress
- SRNL rheology measurements established key physical parameters supporting APA testing
Bi-Monthly Technology Exchange meetings between DOE, Parsons, SRR, and SRNL have facilitated beneficial lessons learned

Several lessons learned have been incorporated into the SWPF design to improve plant availability and maintainability

- **Strip Effluent Coalescer Pumps**: Enables facility to extend operations in the event of increased coalesce differential pressure to preclude unplanned maintenance down-time (MCU lesson learned)

- **Strip Effluent Hold Tank Recirculation Lines**: Enables rapid recovery from unplanned high solvent carryover event to avoid protracted removal evolutions (MCU lesson learned)

- **CSSX Contactor Vent Flush Capability**: Enables full flushing of cesium carryover into the CSSX vent lines to preclude protracted evolutions to install temporary shielding thereby minimizing maintenance down-time (MCU lesson learned)
Full scale cold CSSX testing by Parsons of baseline solvent has demonstrated throughput capacity up to 9 Mgal/yr vs. baseline of 6 Mgal/yr

Identified hydraulic operational parameters necessary to achieve stability at 100% of contactor rated flow
Full scale cold CSSX testing by Parsons of enhanced Next Generation Solvent (NGS) demonstrated potential throughput capacity up to 12 Mgal/yr

Higher solubility of NGS extractant requires less solvent to achieve required decontamination, thereby facilitating more waste throughput

ORNL and SRNL fundamental development efforts on NGS enabled this significant enhancement

DOE currently exploring NGS deployment for SWPF

NGS – “MAX Calix” Molecule
- Full scale cold CSSX testing by Parsons of High Molarity Salt Feed demonstrated potential effective CSSX throughput capacity up to 15+ Mgal/yr
- DOE-SR recommended and supported testing of salt feed at higher feed concentrations
- Higher feed concentration increases effective throughput, decreases upstream blending requirements, and decreases downstream grout vault storage volumes
Hot pilot operations by SRR at MCU have demonstrated the operability and effectiveness of both the baseline solvent and NGS. Decontamination Factor performance of both baseline solvent and NGS have exceeded expectations.
SWPF 3-D Model
SWPF Construction Progress

August 2009

Basemat Installed
- Performance Category 3 (PC-3)
- 8-feet thick
- 32,943 square feet
- 10,032 cubic yards

First Story Under Construction
- Walls to 100 ft. elev. Completed
- Began installation of process piping
- Wall placement to 139 ft. elev. in progress
- Successful installation of contactor modules
- Dark cells fabricated

April 2011

Vessel Placement
- Successful installation of
- 10 large ASME Vessels
- 150,000 gal. of tank volume in CPA
- PC-1 support structures underway

TODAY

TODAY - 83% Physical Completion
- Roof completed
- HVAC 91% complete
- Ventilation stack completed
- Fire coating in progress
- Transformers and switchgear in place
- All major process equipment in place
- Waste transfer line installation in progress
- 97,329 LF of piping installed (86% complete)
- 76,766 welds made (93% complete)
- 135,351 LF of conduit installed (84% complete)
- 486,606 LF of wire and cable installed (60% complete)

Construction Completion Date - 12/31/16
SWPF Completed Facility

Area ~140,000 sq.ft
Basemat 8 ft. thick
Concrete ~40,000 cubic yards
Pipe ~23 miles
Welds ~74,560
Wire and Cable ~816,690 LF

Rebar ~4,600 tons
Actuated Valves ~1,000
Manual Valves ~3,000
Instruments ~1,500
 Tanks 85
Pumps 116

Safety ◆ Quality ◆ Schedule ◆ Cost ◆ Customer Satisfaction
Success is possible on complex DOE nuclear capital projects!!!!

- “Good Leadership and Personnel Are the Foundation”
- “Plan with Realism”
- “Work the Plan”
- “Design with Margin”
- “Procure with Purpose”
- “Construct with Vision”
- “Inspect with Perspective”

Succeed Together as a Team
SWPF Path Forward
High degree of technical confidence

Maintain safety, cost and schedule performance under the new integrated baseline

Integrate NGS and High Sodium processing to enhance throughput

Optimize facility operability

Maintain integration with SR Liquid Waste Program

Minimize LW lifecycle costs
The SRS is poised for success with a complete Liquid Waste solution path
- DOE-SR has established a sound and integrated clean-up strategy
- SRR has demonstrated the capability to clean and close tanks, prepare and make glass at high capacity, and safely prepare and transfer waste feeds
- SRNL has supported success through technology innovation, technology deployment and operations optimization
- Parsons is ready to deliver the technically mature and high capacity SWPF that is the keystone to the next major DOE-EM clean-up success