Salt Waste Processing Facility Project
Status and Path Forward
SC Governor's Nuclear Advisory Council

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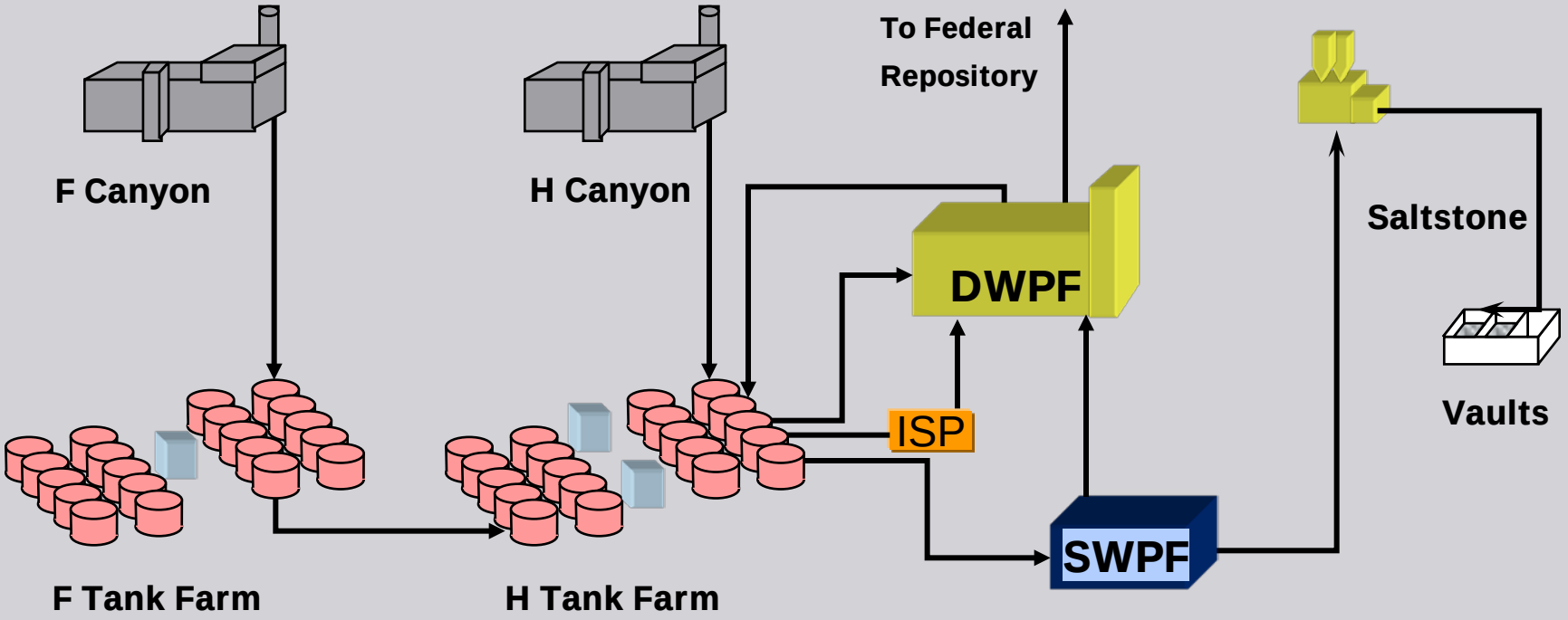
SWPF Project Overview

Salt Waste Processing Facility Mission

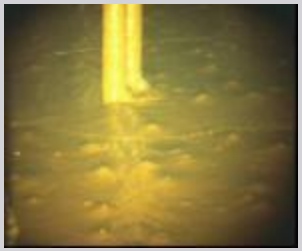
This critical facility will:

- 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



Sludge



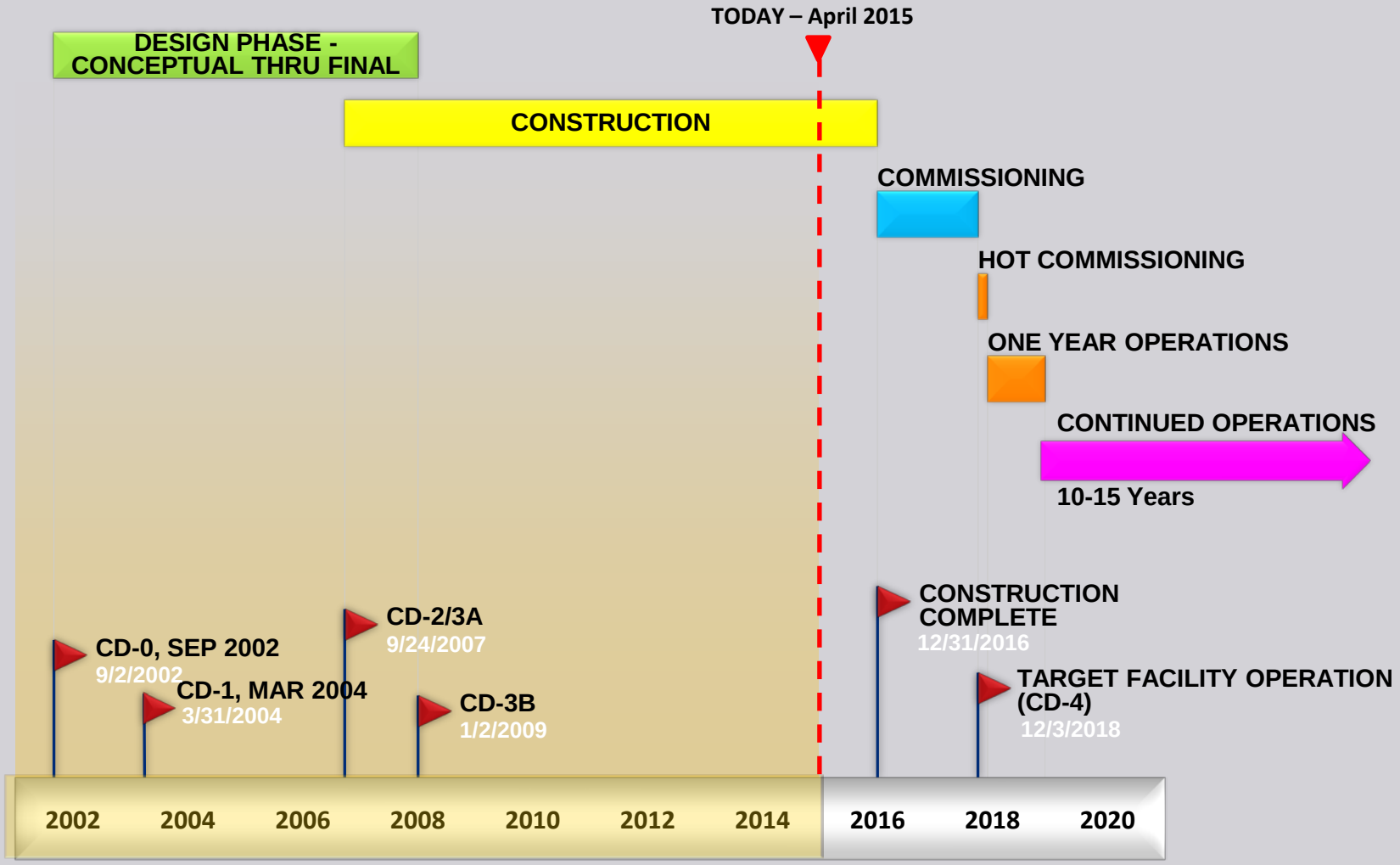
Salt

Supernate

SWPF

- ✓ 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

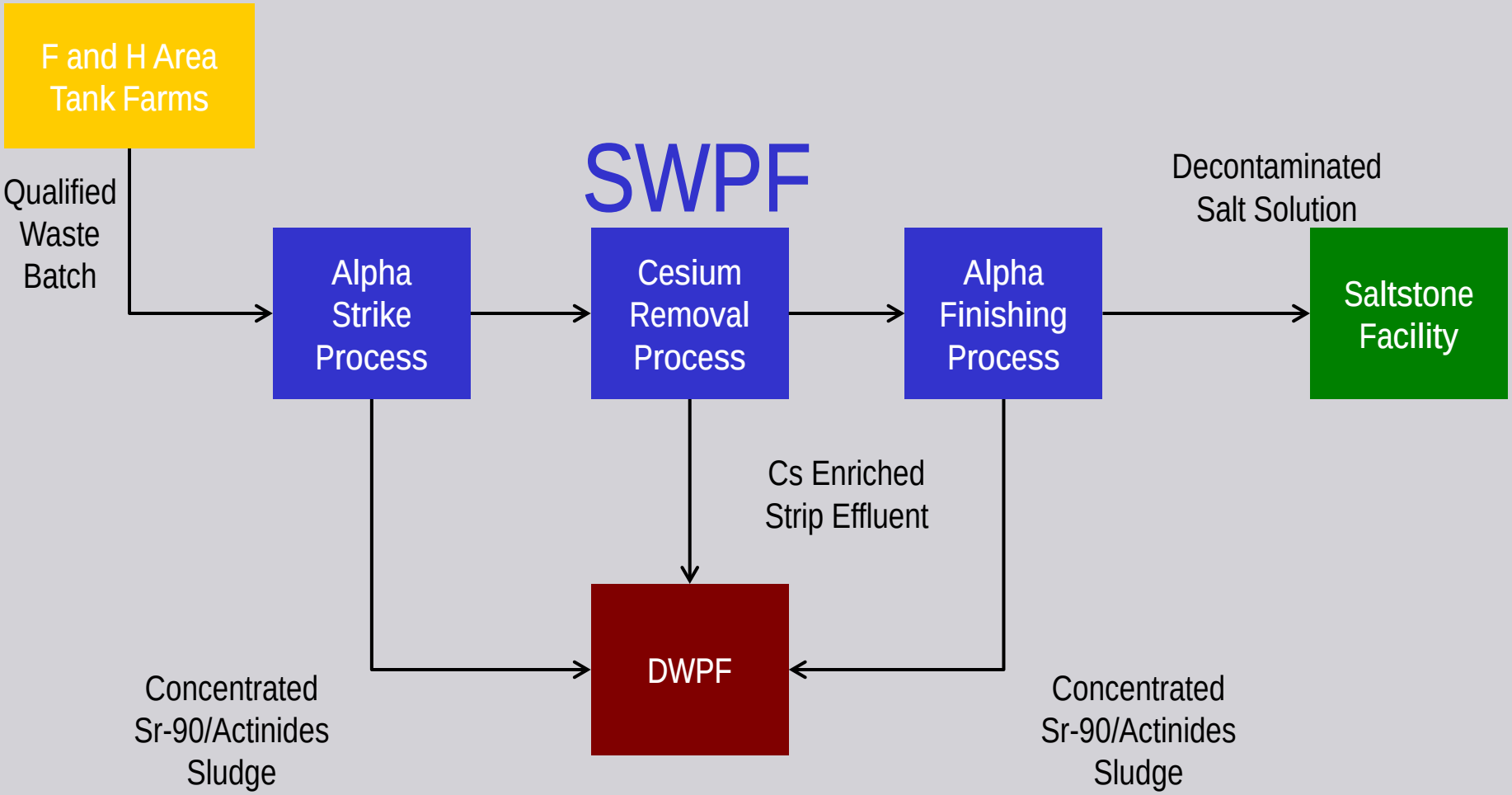


SWPF Project Status

Salt Waste Processing Facility

- 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



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

SWPF Process Status: Availability

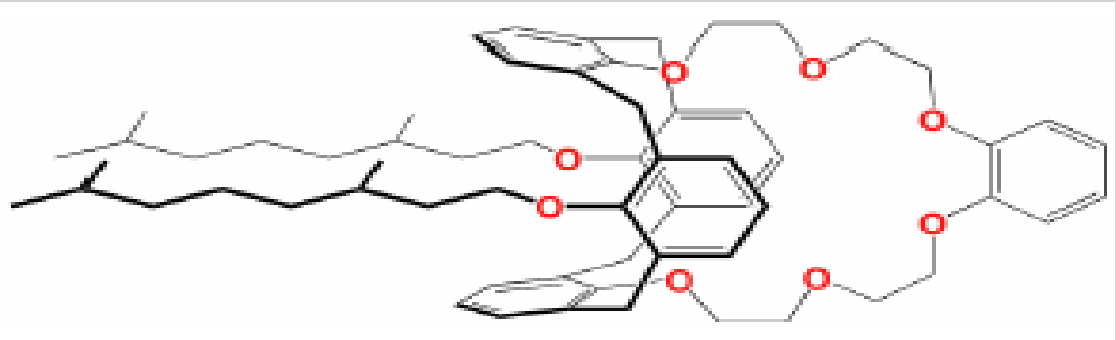
- Bi-Monthly Technology Exchange meetings between DOE, Parsons, SRR, and SRNL have facilitated beneficial lessons learned
- Several lessons learned have been incorporated into the SWPF design to improve plant availability and maintainability
- **Strip Effluent Coalescer Pumps**: Enables facility to extend 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)

SWPF Process Status: Throughput

- 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

SWPF Process Status: Throughput (Cont'd)

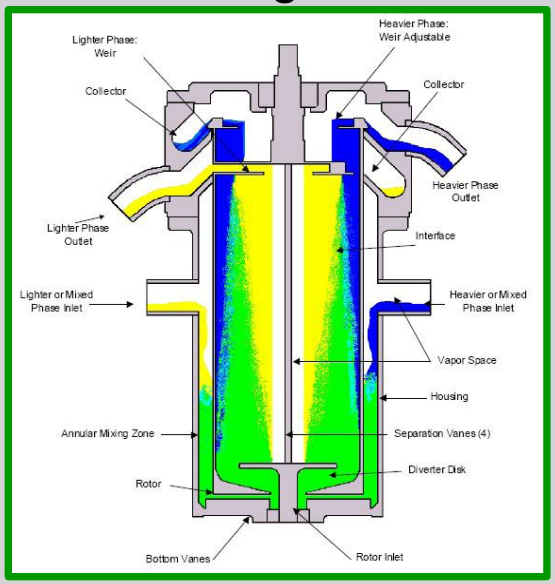
- Full scale cold CSSX testing by Parsons of enhanced Next Generation Solvent (NGS) demonstrated potential throughput capacity up to 12 Mgal/yr
- Higher solubility of NGS extractant requires less solvent to achieve required decontamination, thereby facilitating more waste throughput
- ORNL and SRNL fundamental development efforts on NGS enabled this significant enhancement
- DOE currently exploring NGS deployment for SWPF



NGS – "MAX Calix" Molecule

SWPF Process Status: Throughput (Cont'd)

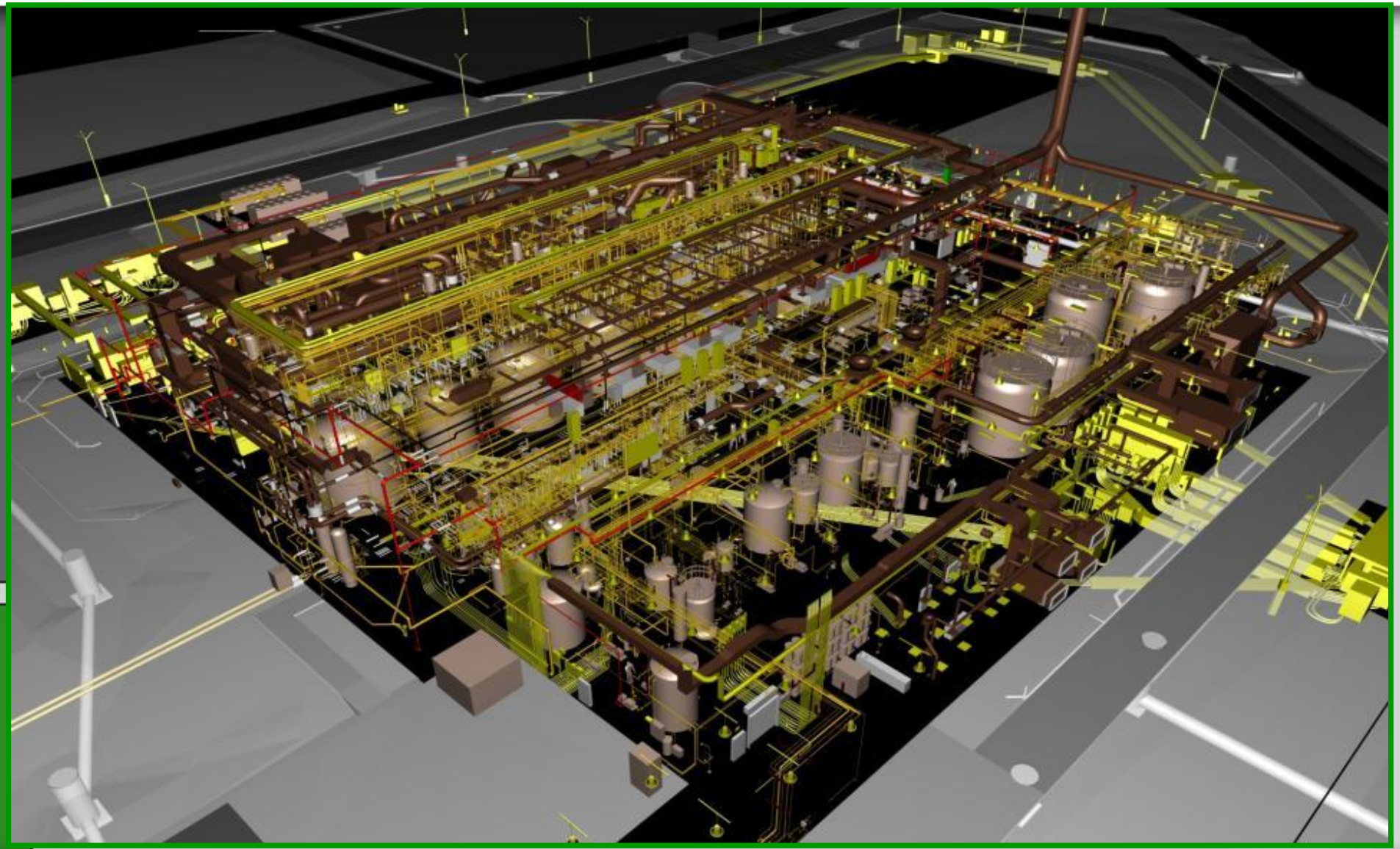
- Full scale cold CSSX testing by Parsons of High Molarity Salt Feed demonstrated potential effective CSSX throughput capacity up to 15+ Mgal/yr
- DOE-SR recommended and supported testing of salt feed at higher feed concentrations
- Higher feed concentration increases effective throughput, decreases upstream blending requirements, and decreases downstream grout vault storage volumes



SWPF Process Status: Throughput (Cont'd)

- 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

April 2011

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

May 2012

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

SWPF Stats			
Area	~140,000 sq.ft	Rebar	~4,600 tons
Basemat	8 ft. thick	Actuated Valves	~1,000
Concrete	~40,000 cubic yards	Manual Valves	~3,000
Pipe	~23 miles	Instruments	~1,500
Welds	~74,560	Tanks	85
Wire and Cable	~816,690 LF	Pumps	116

SWPF Key Lessons Learned

- 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

SWPF Path Forward: Looking to the Future

- 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

SWPF Path Forward: Keystone to Unique Success Opportunity at SRS

- ***<u>The SRS is poised for success with a complete Liquid Waste solution path</u>***
- 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