



U.S. DEPARTMENT OF
ENERGY



Defense Waste Processing Facility Update

November 26, 2018

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Savannah River Remediation

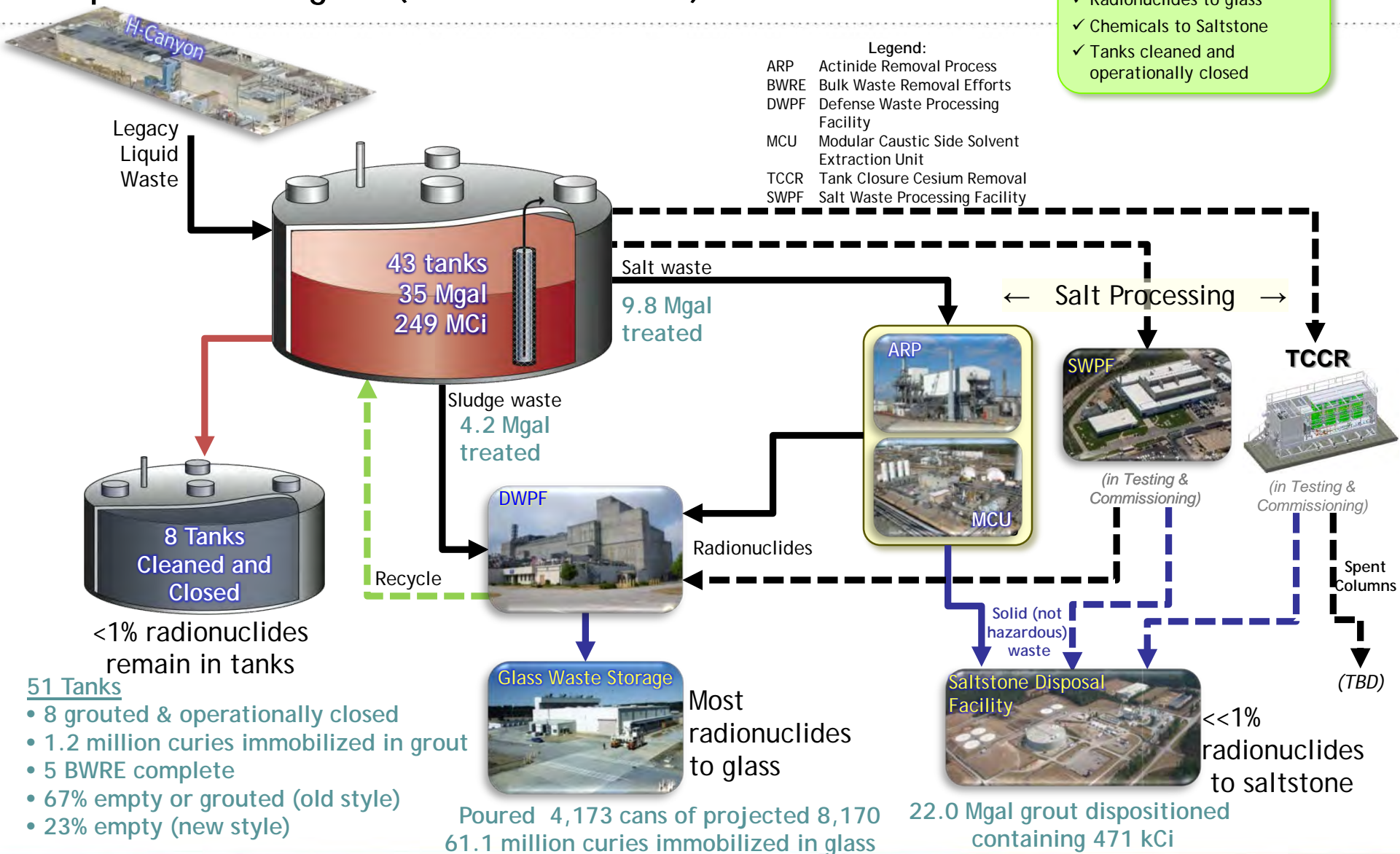
Purpose

Provide FY18 update to CAB on Defense Waste Processing Facility (DWPF) and Glass Waste Storage Building (GWSB).

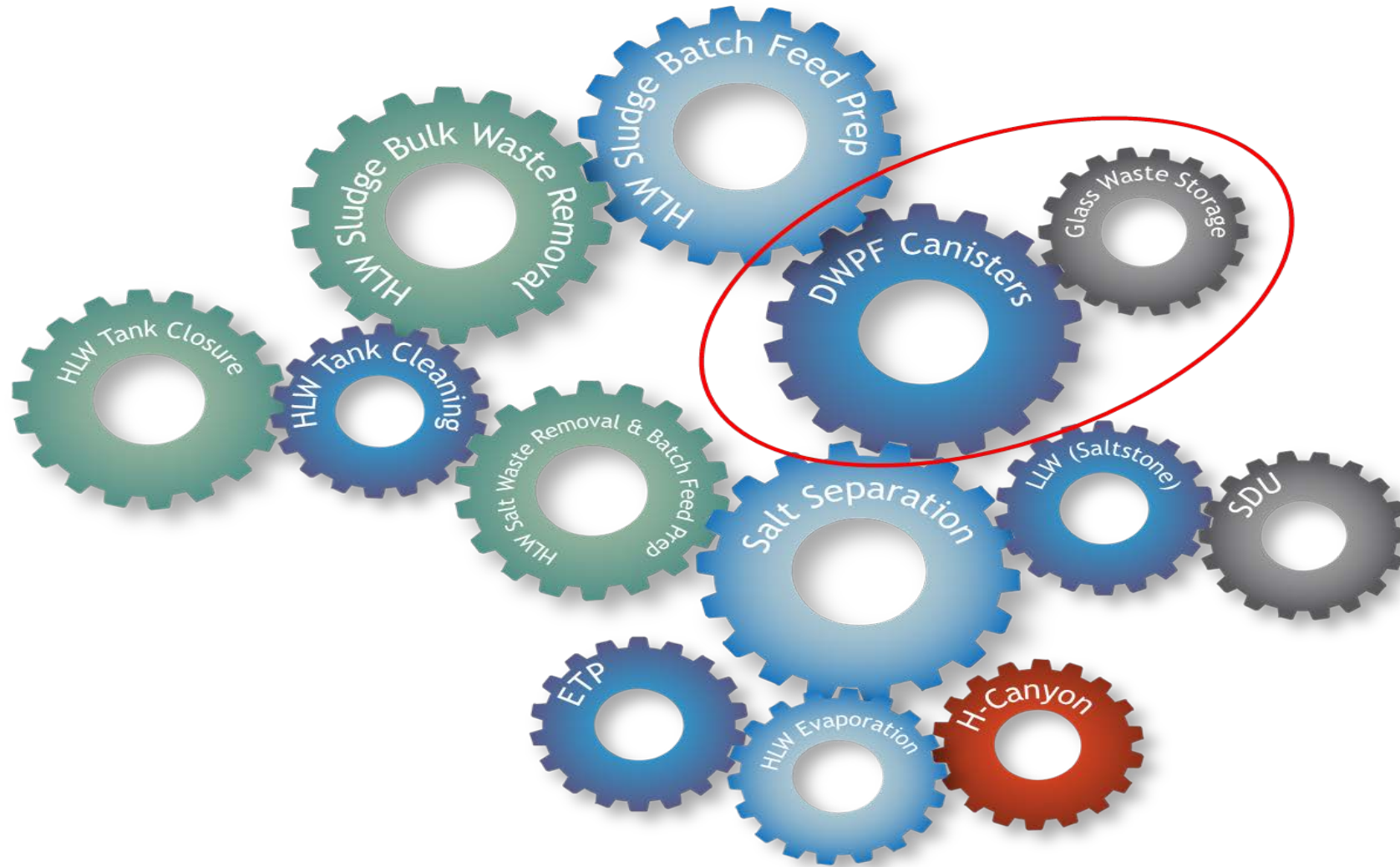
Outline

- Overview of Liquid Waste (LWO) & DWPF
- LWO Outage Integration
- Summary of Melter 2 Replacement Outage
- DWPF Facility Outage
- Melter 4 Fabrication
- Canister Double Stack
- Q&A

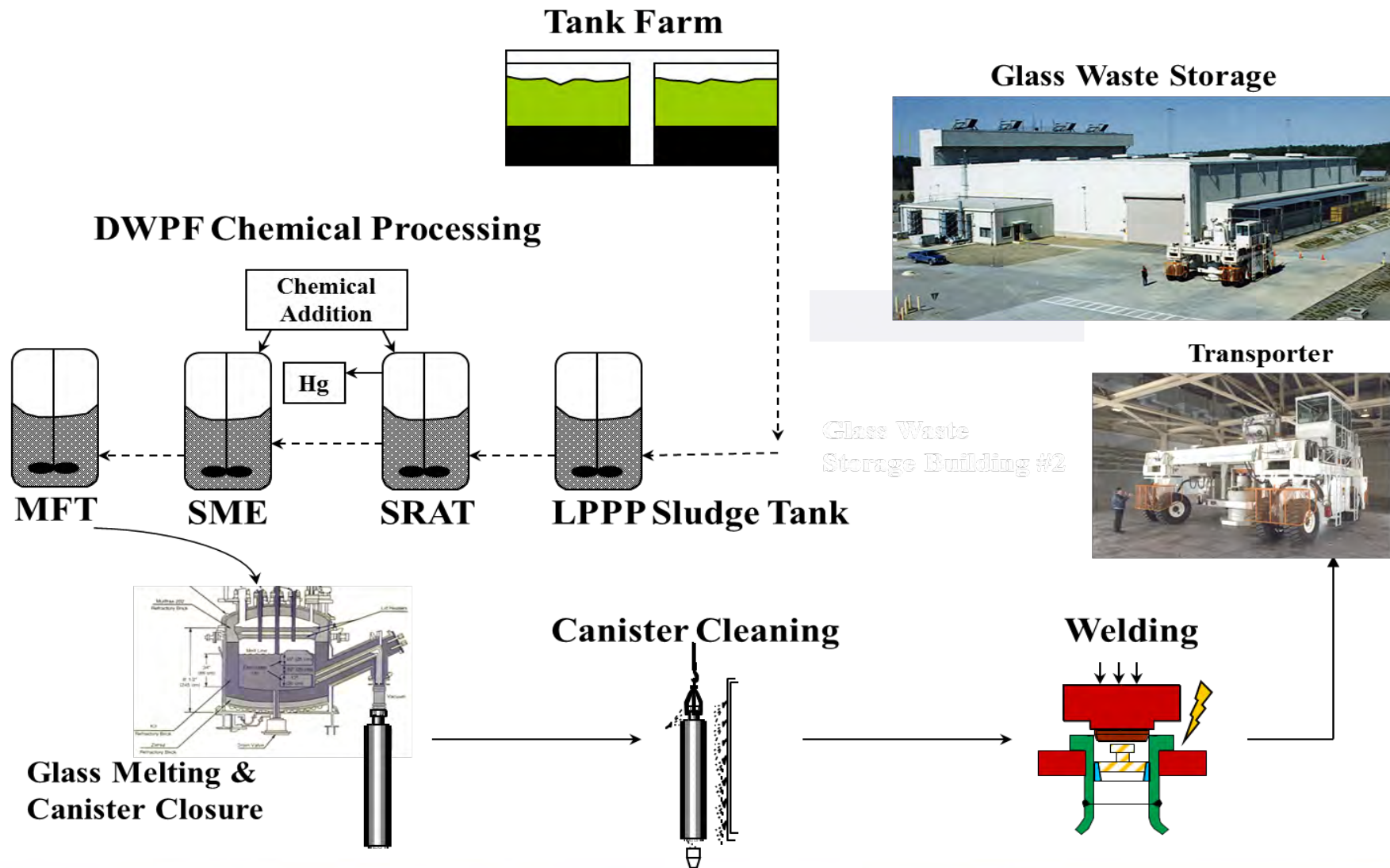
Liquid Waste Program (with current status)



An Integrated System



Vitrification Process



Melter 2 Removal Preparations

- **Cell Cover Cleanup for Melter 2 Exit Route**
 - 4 containers of equipment removed from cell covers
 - 2 containers to E area for disposal
 - 2 containers staged for reuse
- **Cranes & Railroad**
 - Cranes – MPC, FESV, Mobile
 - *Completed Preventive/Corrective Maintenance, Inspections, Modifications, & Functional Checks*
- **Rail System**
 - Engine + 5 spacer cars + Melter Railcar
 - Rail Replacement (5 sections)
 - Switch (38) & Cross (621) Tie Replacement



Cell Cover Cleanup



Last Container for Phase I Cleanup

Melter 2 Removal

- Melter 2 (14 years of service)
 - Jumper & component removal (93 total)
 - Post-mortem inspection & evaluation
 - Melter blowdown
 - Melter rad dose evaluation
 - Mockup for lid management
 - Contamination control preparations
 - *Railroad Well (RRW)*
 - *Melter Storage Box (MSB) & Melter Railcar*
 - Management Checklist to confirm readiness
 - Removal of Melter from the facility
 - *Melt Cell to RRW*
 - *RRW to FESV*
 - Melt Cell cleanup using robotics
 - Jumper inspections



Post-Mortem Inspections



Mockup: Lid Management



Melter 2 Removal



Melter 2 inside Melter Storage Box



Additional Glass Contaminated Equipment Placed in MSB



2017-05-15 11:47:30
Fixative Application for Contamination Control



Melter Storage Box Lid Installation



Melter Storage Box en route to Vault



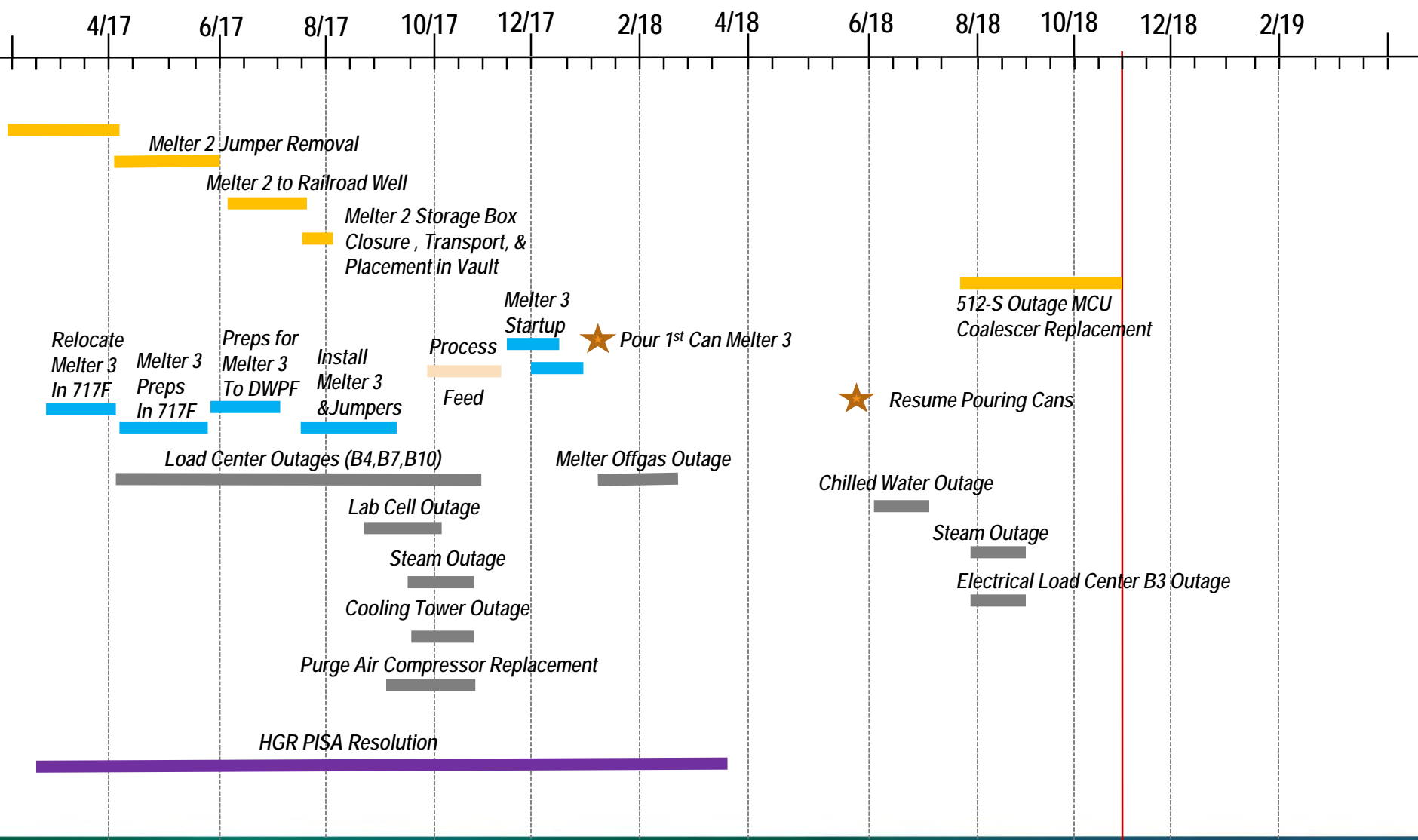
Melter Storage Box being lowered into Vault

Excellence in ISMS & ALARA: 45 workers received a collective dose of 179 mrem!

Melter 3 Transport/Installation



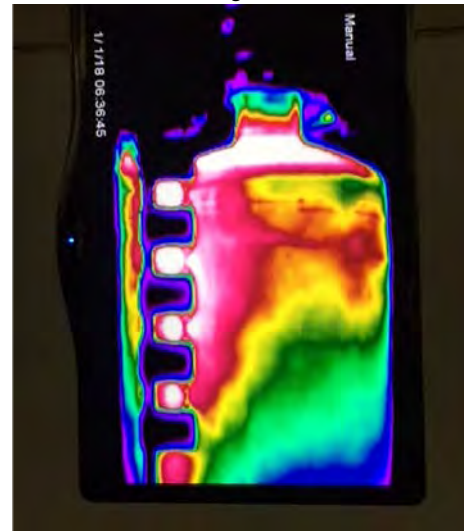
2017-2018 Waste Treatment Overview



Melter 3 Installation Scope

- Melter 3

- Transport Melter 3 to DWPF
- Repeat inspection & checkout process in the Railroad Well
 - *Perform electrical testing / checkout*
- Melt Cell cleanup
- Jumper inspections/gasket replacement
- Preparations for moving Melter 3 to the Melt Cell
- Management Checklist to confirm readiness to fly Melter 3 to the Melt Cell
- Melter 3 re-assembly
- Melter 3 startup & test
- Begin feed and pour
- Bubbler replacement 8/3/18
- New electrode power supplies in startup testing.



Melt Cell Before & After



DWPF Facility Outage

- In addition to the outage forced by SWPF tie-in and Melter replacement, four deficiencies were identified with the liquid waste Safety Bases that required action:

- Hydrogen generation rate due to organic thermolysis (3 separate PISAs)
- Use of non-conservative dose estimates for zone 1 effluent onsite consequences
- Event progressions with lube oil pool fires (2 PISAs)
- Seismic event crushed canister consequences

- A separate facility outage scope included preventive and corrective maintenance to numerous plant systems
Examples included:

- | | |
|------------------------|---------------------------------|
| • Electrical | • Steam |
| • Melter Cooling Water | • Nitrogen |
| • Plant Cooling Water | • Shielded Canister Transporter |
| • Process Water | • DWPF Lab |
| • Off-Gas | • Process Chilled Water |



Process Chilled
Water Pump

Outage Activities



SMECT Scrubber
Pump Installation



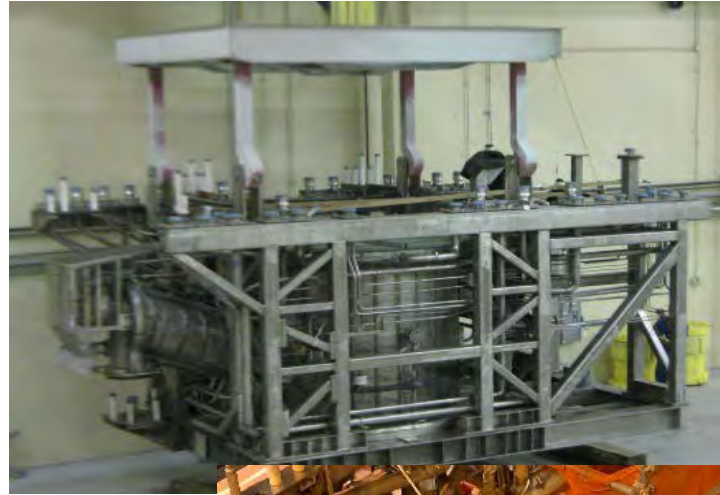
Lab shield window
removal for sample
cell upgrades

Off-Gas Remote HEPA
Replacement



DWPF Melter 4 - Status

- Final Melter assembly initiated June 2018, overall duration of ~18 months and ROM ~\$4M
- Near-term scope:
 - Electrodes
 - Dome heaters & transformers
 - Riser/pour spout heater
- Current schedule supports Melter 4 completion in early 2020

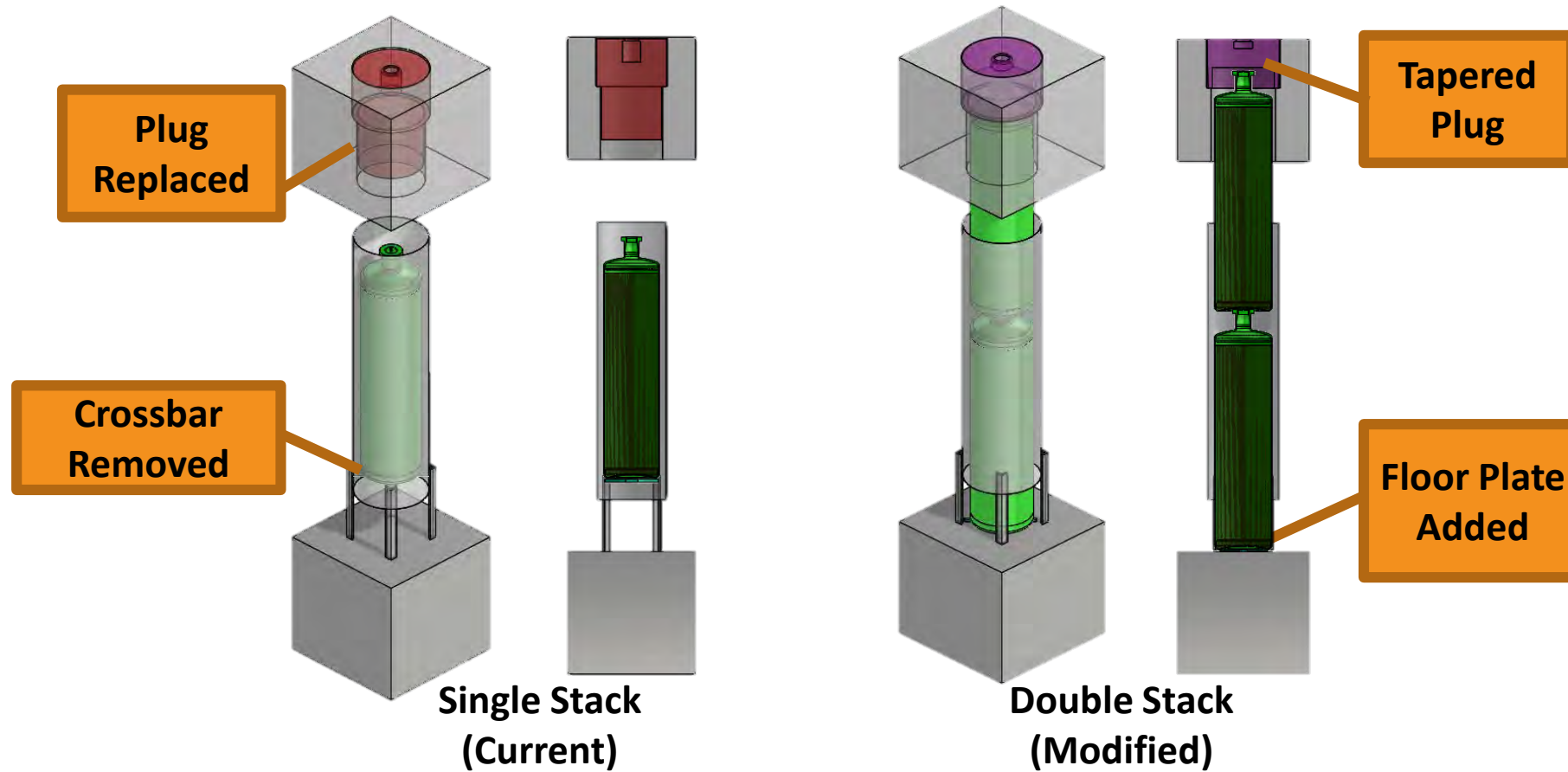


Melter 4
(without dome)



Riser Installation

Canister Double Stack Modifications



SRR Developed Remote Cutting Tool



Crossbar Cutting Tool in Field



Completed Crossbar Cut

1. *Tool capable of removing 1 ½ inch x 3 inch galvanized steel*
2. *Control amount of water and carbon steel particles*
3. *Minimum efficiency of 2 storage locations per shift*

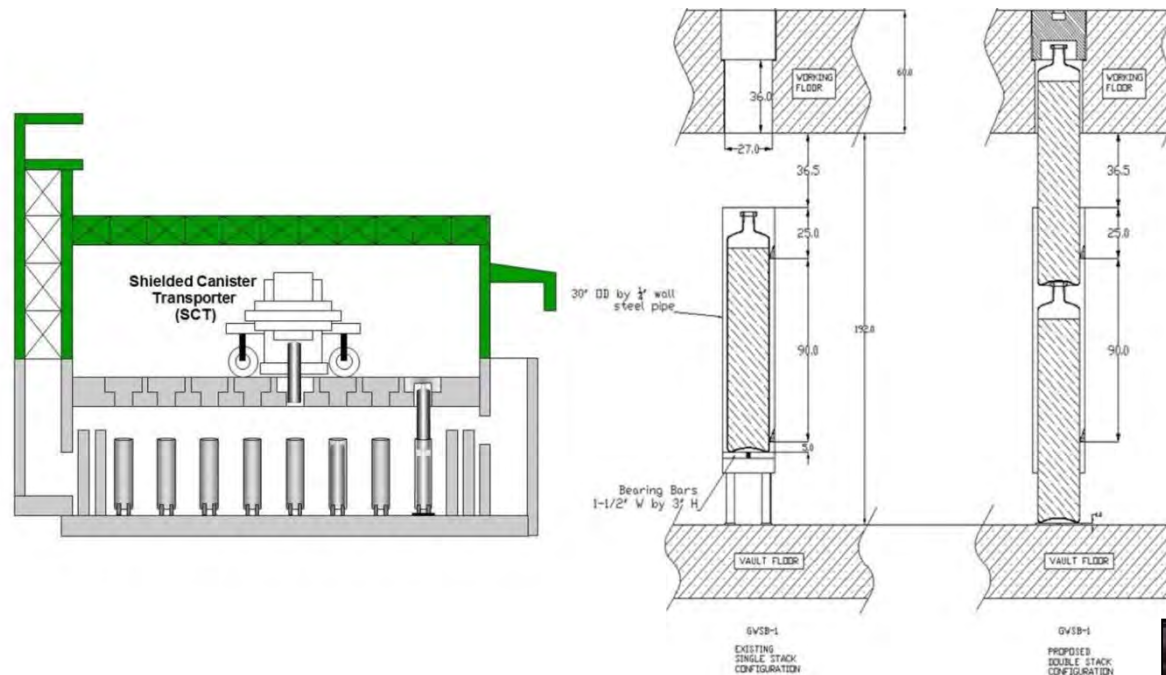


First Canister Support Crossbar Removed



Shield Plug Replacement

DWPF Canister Double Stack Update



Status:

1. **Completed position modifications in GWSB #1 vault A (546 positions). Completed 270 position modifications in vault B.**
2. **Completed double stacking 529 canisters.**

Overall goals for Interim Double Stack:

- Increase GWSB #1 Capacity from 2,262 to 4,524
- Overall GWSBs Capacity Increased to 6,864 providing space through FY 29





Questions And Comments?

Acronym List

ALARA: As Low As Reasonably Achievable

ARP: Actinide Removal Process

BWRE: Bulk Waste Removal Efforts

CY: Calendar Year

DSA: Documented Safety Analysis

DWPF: Defense Waste Processing Facility

ETP: Effluent Treatment Project

FESV: Failed Equipment Storage Vault

GWSB: Glass Waste Storage Building

HEPA: High Efficiency Particulate Air Filter

HLW: High Level Wastes

ISMS: Integrated Safety Management System

LPPP: Low Point Pump Pit

MCU: Modular Caustic Side Solvent Extraction Unit

MFT: Melter Feed Tank

MSB: Melter Storage Box

PISA: Potential Inadequacy in the Safety Analysis

RRW: Railroad Well

SCT: Shielded Canister Transporter

SDU: Salt Disposal Unit

SME: Slurry Mix Evaporator

SMECT: Slurry Mix Evaporator Condensate Tank

SRAT: Sludge Receipt and Adjustment Tank

SWPF: Salt Waste Processing Facility

TCCR: Tank Closure Cesium Removal