SRS Liquid Waste Update

April 13, 2017
South Carolina Nuclear Advisory Council

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Department of Energy
Savannah River Operations Office
Overall Schedule for Liquid Waste Facilities

- **2017**
  - DWPF Melter Changeout
  - 3H Evaporator Repair
  - 2H Evaporator Maintenance
  - SDU-6 Testing
  - SWPF Safety Analysis
  - TCCR Design
  - Equipment Procurement and Delivery
  - SWPF Tie-in
  - SWPF Start-up
  - TCCR Installation & Startup Testing

- **2018**
  - DWPF Return to Service
  - MCU Return to Service
  - 3H Evaporator Return to Service
  - 2H Evaporator Operations
  - SDU-6 Ready for Operations
  - SWPF Cold Commissioning
  - TCCR Start-up
  - TCCR Installation & Startup Testing

- **2019**
  - SWPF Hot Tie-ins
  - MCU Cease Operations
  - East Transfer Line Tie-ins
  - Operations Readiness Reviews
  - SWPF Reviews
  - TCCR Evaluation
  - Filling SDU-6
Liquid Waste Integrated Schedule

(Select CLIN 2A)

SWPF Tie-In — Advanced Start

(Note: Not Resource Loaded)
3/28/2017 6:12 AM
Operational Highlights (as of March 8, 2017)

**DWPF**
- 52 canisters completed
- 137 canisters double stacked
- DWPF Melter 2 removal activities under way

**Saltstone**
- Saltstone Disposal Unit (SDU) 6 water-tight start-up testing completed, turnover in progress

**Tank Farms**
- 3H Evaporator leak sites identified at the bottom section of the cone

**Actinide Removal Process/Modular Caustic Side Solvent Extraction Unit (ARP/MCU)**
- MCU operations suspended due to Melter 2 end-of-life
Melter 2 Replacement

- The replacement effort includes the following scope:
  - Melter 2 Removal
  - Melter 3
    - Placement of melter into the mock-up cell
    - Installation and checkout of components
    - Transport to Defense Waste Processing Facility (DWPF)*
    - Inspection and checkout of components at DWPF*
    - Startup and testing of Melter 3*
  - Cranes and Rails
    - Inspection and maintenance of multiple cranes, including specialty cranes used only for Melter movements.
    - Inspection and maintenance of rail systems and railcars
- The Melter Replacement scope is being integrated with the DWPF Outage scope, which includes maintenance on numerous systems that can only occur during a Melter Outage
- The baseline schedule is being finalized and will include an independent review by personnel involved in Melter 1 replacement
* Item not in-progress due to completion of predecessor activities
SWPF Scope Update

SWPF Support
- Liquidus model report is on track to complete May 2017
- NGS Conceptual Design is on track
  - 30% internal design review under way

DWPF Modifications
- DSA to support Flush Plan is on track for delivery to DOE-SR in early March
- DSA work continues with the MCU DSA change showing transmittal to DOE in mid-March

West Transfer Lines
- Vendor mobilization in progress
  - Sheet piling installation planned 3/6-3/23
  - Pilot holes to support sheet piling are complete
- Work packages to install transfer line mods in progress
- Coordinate outages/flushing activities with Melter 2 replacement

Tank 49 Feed Modifications
- Phase III Transfer Line
  - Core and jacket pipe installation are complete
  - Backfill under way
- Jumper fabrication for connecting B3 pump and T49 valve box is installed
  - Valve box cover modifications are under way
- B3 pump modifications are complete
  - Testing scheduled for mid-March
Tank Closure Cesium Removal

**Objective**
- Modular, at-tank, ion exchange technology demonstration designed to remove Cesium and enhance bulk waste removal efforts
- Leverage commercial supplier expertise and contemporary Fukushima experience
- Improve flexibility by exploring alternatives for off-site disposition of used resin
- Simple design, reliable, cost-effective

**Status**
- Contract awarded to Westinghouse Electric Company in July 2016
- Detailed design is nearly complete
- Procurements and fabrication under way
- Equipment delivered in October 2017
- Siting, utility, and transfer line design work by SRR is under way
- Will be operated by site staff when complete
3H Evaporator Recovery

**Leak site identification**
- Insulation removal from the cone of the evaporator complete
- Used robot to flush exterior of pot cone
- Dye added to pot and pot heated
- Three leak sites identified in bottom cone

**Path forward/repair**
- Repair options are being developed as part of contract for repair
- Characterization of cone using ultrasound, external dye, and laser mapping

**New vessel**
- Proposals were received for fabrication of new evaporator vessel
- Evaluation of proposals complete
- Decision to procure new vessel is dependent on repair success and funding
Saltstone Update

- Completed an independent verification of the 2016 safety basis annual update
- Initiated a Facility Self Assessment for Saltstone Disposal Facility 6 (SDU 6) readiness
  - The assessment is expected to continue for 2 weeks
  - Project remains on schedule
- Saltstone expected to be processing decontaminated salt solution by mid-May
# FY16 Liquid Waste Plan

<table>
<thead>
<tr>
<th>Scope of Work</th>
<th>FY16 Planned Accomplishments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tank Farm Operations</strong></td>
<td>180,264 Process 1.126 Mgal of salt solution through MCU. Complete Sludge Batch 9 prep. Complete processing of Salt batch 8, initiate processing of Salt Batch 9.</td>
</tr>
<tr>
<td><strong>DWPF/SS Operations</strong></td>
<td>134,493 Produce 133 Canisters of Vitrified HLW. Process 1.5 Mgal of DSS into grout.</td>
</tr>
<tr>
<td><strong>SWPF Support Projects</strong></td>
<td>15,924 Continue DWPF Mods, Blend &amp; Feed tanks (Tank 49 transfer line work), East-West transfer line tie-in. Continue DWPF alternate reductant implementation.</td>
</tr>
<tr>
<td><strong>Tank Closures</strong></td>
<td>4,402 Completed grouting of Tank 12 April 2016.</td>
</tr>
<tr>
<td><strong>Saltstone Disposal Units</strong></td>
<td>24,381 Continue construction of SDU 6. Initiate SDU 7 planning activities.</td>
</tr>
<tr>
<td><strong>Supplemental Salt Initiatives</strong></td>
<td>2,351 Initiate procurement of Tank Closure Cesium Removal (TCCR) to meet Tank 10 BWRE commitment.</td>
</tr>
<tr>
<td><strong>Glass Waste Storage</strong></td>
<td>2,157 Continue limited canister double stack implementation.</td>
</tr>
<tr>
<td><strong>Business Services</strong></td>
<td>37,709 Program Support and Business Services</td>
</tr>
<tr>
<td><strong>Pension, Legacy, and Fee</strong></td>
<td>27,712 Legacy Medical cost and Fee</td>
</tr>
<tr>
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<td><strong>450,486</strong></td>
</tr>
</tbody>
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## FY17 Liquid Waste Plan

<table>
<thead>
<tr>
<th>Scope of Work</th>
<th>FY17 Planned Accomplishments</th>
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</thead>
<tbody>
<tr>
<td>Tank Farm Operations</td>
<td>194,500 Target 1.3 Mgal of salt solution through MCU. Process Sludge Batch 9. Complete</td>
</tr>
<tr>
<td></td>
<td>processing of Salt batch 9. Initiate processing of Salt Batch 10 and compile Salt Batch 11.</td>
</tr>
<tr>
<td></td>
<td>Perform Tank 41 Salt Dissolution campaign. Continue procurement of 3H evaporator pot.</td>
</tr>
<tr>
<td>DWPF/SS Operations</td>
<td>147,045 Target 100 Canisters of Vitrified HLW. Target 0.9 Mgal of DSS into grout.</td>
</tr>
<tr>
<td>SWPF Support Projects</td>
<td>21,375 Continue DWPF Mods, Blend &amp; Feed tanks (Tank 49 transfer-line work), East-West</td>
</tr>
<tr>
<td></td>
<td>transfer line tie-in. Initiate SWPF tie-in outage. Work on dry feeds for Saltstone Facility.</td>
</tr>
<tr>
<td>Tank Closures</td>
<td>1,000 Initiate Heel Removal activities on Tank 15</td>
</tr>
<tr>
<td>Bulk Waste Removal</td>
<td>11,170 Complete Tank 15 BWRE and initiate waste removal preparation activities on Tank 3</td>
</tr>
<tr>
<td></td>
<td>and Tank 9.</td>
</tr>
<tr>
<td>Saltstone Disposal Units</td>
<td>21,608 Complete construction of SDU 6 and initiate construction of SDU7 (LI Authorization</td>
</tr>
<tr>
<td></td>
<td>Required)</td>
</tr>
<tr>
<td>Supplemental Salt Initiatives</td>
<td>15,000 Continue Tank Closure Cesium Removal (TCCR) procurement</td>
</tr>
<tr>
<td>Glass Waste Storage</td>
<td>4,725 Continue canister double stack implementation</td>
</tr>
<tr>
<td>Business Services</td>
<td>49,500 Program Support and Business Services and contract transition</td>
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<tr>
<td>Pension, Legacy, and Fee</td>
<td>21,700 Pension, Legacy Medical and Fee</td>
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<tr>
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<td><strong>487,623</strong></td>
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## FY18 Liquid Waste Plan

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<tr>
<td>DWPF/SS Operations</td>
<td>Target 100 Canisters of Vitrified HLW. Target 2.7 Mgal of DSS into grout.</td>
</tr>
<tr>
<td>Tank Closures</td>
<td></td>
</tr>
<tr>
<td>Saltstone Disposal Units</td>
<td>Continue construction of SDU 7</td>
</tr>
<tr>
<td>Supplemental Salt Initiatives</td>
<td>Complete Tank Closure Cesium Removal (TCCR) demonstration for cesium removal and complete Tank 10 BWRE.</td>
</tr>
<tr>
<td>Glass Waste Storage</td>
<td>Continue canister double stack implementation</td>
</tr>
<tr>
<td>Business Services</td>
<td>Program Support and Business Services</td>
</tr>
<tr>
<td>Pension, Legacy, and Fee</td>
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