TANK CLOSURE STATUS
December 6, 2016

DOE/SRR LIQUID WASTE PROGRAM UPDATE

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SRR-CWDA-2016-00131
Contents

- Overall Program Update
- Current Tank Status
- Focus Areas

TCCR Module Assembly

Tank 15 Bulk Waste Removal Execution
### F-Tank Farm Older Style Tanks

<table>
<thead>
<tr>
<th>Type</th>
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<td>Saltcake Tank</td>
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<td>High Caustic Supernate</td>
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</table>
If one considers the average tank volume (averaged across Type I, II, and IV tanks):

- 8.7 equivalent tanks are operationally closed
- 3.9 are out of service (vapor space above HLLCP)
- 3.6 are empty (available vapor space below HLLCP)
- 7.8 are in continued use
Another Way of Looking at the 24 Old-Style Tanks…

- Sludge: 0.5 Mgal
- Salt: 24 Mgal
- Low Activity Supernate: 14 Mgal
- Supernate: 3.5 Mgal
- Empty Space: 7.5 Mgal
- Grout: 8.6 Mgal

2016-09-30
Objective

- Modular, at-tank, ion exchange technology demonstration designed to enhance bulk waste removal efforts
- Leverage commercial IX supplier expertise and Fukushima experience
- Improve flexibility by exploring alternatives for spent resin disposal
- Simple, reliable, cost effective

Status

- Contract awarded to Westinghouse Electric Co on 7/7/16
  - 50% Design Submittal complete 11/4/16
  - Planned equipment delivery is 9/17
- Safety Basis Strategy approved by SRR
- Process flowsheet, modeling and design input complete
- Demonstration of TCCR equipment planned on Tank 10 salt waste for Spring 2018
Tank 15H

Bulk Waste Removal Execution Initiated

SMPs

October 20, 2016
Accomplished in FY2016

• Completed startup testing
• Completed readiness evaluation
• Initiated BWRE Campaign 1

Remaining Scope

• Continue BWRE mixing and transfer campaigns*

* BWRE schedule impacted by the failure of the 3H Evaporator pot
We do the right thing.

Tank 15H BWRE

SRR-CWDA-2016-00131

Tank 15H Profile View

Operating Level for Campaign 1 = 137 in.

SMP elevations relative to tank floor
- Riser 2 @ 68 in.
- Riser 3 @ 61 in.
- Riser 4A @ 49 in.
- Riser 8 @ 61 in.

STP elevation relative to tank floor
- Riser 7 @ 36 in.

Tank 15H Plan View

SMP Location
Supernate Recycle
Sludge Slurry

Riser 2 @ 68 in.
Riser 3 @ 61 in.
Riser 4A @ 49 in.
Riser 8 @ 61 in.

Operating Level for Campaign 1 = 137 in.
We do the right thing.

**Tank 15H BWRE**

**Data Date November 15, 2016**

**Initial Supernate Transfer**

**Campaign 1**
- ~60 days

**Campaign 2**
- ~60 days

**Campaign 3**
- ~80 days

**Assumed BWR Campaign Details**

- **10** Run SMPs
- **17** Stop SMPs, collect sample & transport (Hi/Lo Rem)
- **5** Restart SMPs and Transfer Slurry from Tk15
- **19** Slurry Transfer Complete
- **5** Evaluate Flammability & Q-time
- **5** Lower Pumps
- **Transfer Supernate from Tk13 to Tk15**

**Note for Campaign 3:** ~20 additional days required for transfer out of Tk13, settling in Tk51, and recycle supernate back to Tk13
Tank 15H BWRE

Approximate Values per Campaign (to-date)

<table>
<thead>
<tr>
<th>Campaign Number</th>
<th>Initial Liquid Level (in.)</th>
<th>Liquid Volume Added (gal)</th>
<th>SMP Operation Time (hrs)</th>
<th>Volume Transferred Out (gal)</th>
<th>Estimated Sludge Removed (gal)</th>
<th>Estimated Sludge Remaining (gal)</th>
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NOTES

This Period
- No safety events
- Completed first mixing run and collected sample on 11/4
- Sample results needed to quantify Inhalation Dose
  Potential prior to transfer
- Planning for coordination of transfer operations around holiday weekend
- Managing tank temperature using all available cooling coils
- Annulus level decreasing - ventilation fully operational

RISK TRACKING
- Weather Delays -
  - Hurricane Matthew delays restart of transfer (5 days)
- Equipment Issues -
  - Tk13 Riser 6 Transfer Hose In-tank Union (17 days)
  - VFD parameter acceptance requires reprogramming (6 days)
- Annulus In-leakage -
  - Installation of CTS and instrumentation adjustment (7 days)
- Sludge Rheology Issues - none to date
- Radiological Issues - none to date
- Resource Limitations - none to date
- In-process Inspection Delays - none to date
- Sample Analysis Delays - none to date

TANK 15H REFERENCE NUMBERS
- Nominal Tank Capacity = 1,070,000 gal
- Initial Estimated Sludge Volume = 187,000 gal
- Known Leak Sites = 24

ACRONYMS AND ABBREVIATIONS
- BWR – Bulk Waste Removal
- SMP – Submersible Mixing Pump
- STP – Submersible Transfer Pump
- CTS – Contingency Transfer System
- Tk – Tank
gal – gallons
hrs – hours
Tank 15H Significant Risks

- **Equipment failures**
  - Spare STP/SMPs available but replacement would impede BWR operations
  - Already impacted by the unavailability of the 3H Evaporator

- **Primary tank wall failure**
  - Leak rate exceeding capability of CTS would impede BWR operations

- **Sludge rheology**
  - Worse than anticipated rheological properties would impede BWR operations
  - Additional mixing/transfer campaigns required

- **Tank space**
  - Ability to transfer waste out of Tank 15H depends directly upon availability of space in Tank 13H and the downstream system
  - The highly integrated Liquid Waste System must function properly to create space

- **Tank temperature**
  - SMPs generate more heat than cooling coil system can cool causing supernate temperature to exceed SMP operating limit

- **HEPA filter loading**
  - Filter loading reaching the action limit dose rate requires pump shut down to change filters
Tank 26F

July 7, 2016
Accomplished in FY2016

- Completed development operating procedures
- Completed integrated testing of:
  - Four CSMPs and associated turntables
  - One telescoping STP
  - Mixing and transfer control systems
  - Alarms associated with modifications

The need date for Sludge Batch 10 moves out due to 3H Evaporator failure. Waste retrieval preparations have been suspended.
Salt Dissolution Tanks

- Tank 3F
  - Design input developed
  - Designs in progress
    - Ventilation Stack
    - Salt Dissolution equipment
    - Dissolved salt transfer system
- Tank 9H
  - Design input in progress
  - Design expected to begin in January
Focus Areas

- **Completed HTF RCRA/CERCLA Docs**
  - HTF (Tank 16) IASB/PP (Jan 2016) IROD (August 2016), ICMI/RAIP (December 2016), & IRA Start (January 2017)

- **Remove Tank 12H from the Wastewater Permit**
  - Final Configuration Report (almost done)
  - Explanation of Significant Difference (drafting)

- **Tank Closure Cesium Removal**
  - SRR review of Westinghouse 50% design submittals
  - Westinghouse initiate the 90% design activities and long lead procurements
  - SRR initiate development of the Balance of Plant design

- **Tank 15H BWRE**
  - Perform BWRE campaigns

- **Tanks 3F and 9H**
  - Complete design input and continue design process
DOE requested an extension of milestone for two tanks in a letter to SCDHEC and EPA June 1, 2016

EPA and SCDHEC each issued a letter of denial identifying concerns on June 21 and June 22, respectively

DOE invoked the informal dispute resolution process with a letter to SCDHEC and EPA on July 12, 2016

DOE provided additional information regarding extension request, including responses to concerns, August 8, 2016 - all concerns closed and no new regulatory concerns identified

DOE requested minor modifications of two bulk waste removal efforts statements in FFA Appendix L August 8, 2016

Informal dispute resolution meetings held August 31 and October 12, 2016 with next meeting scheduled for December 7