

April 14, 2016

# SAVANNAH RIVER REMEDIATION UPDATE



Mark Schmitz GEPA

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### Our Focus: Safety



**Industrial Safety** 



**Environmental Safety** 





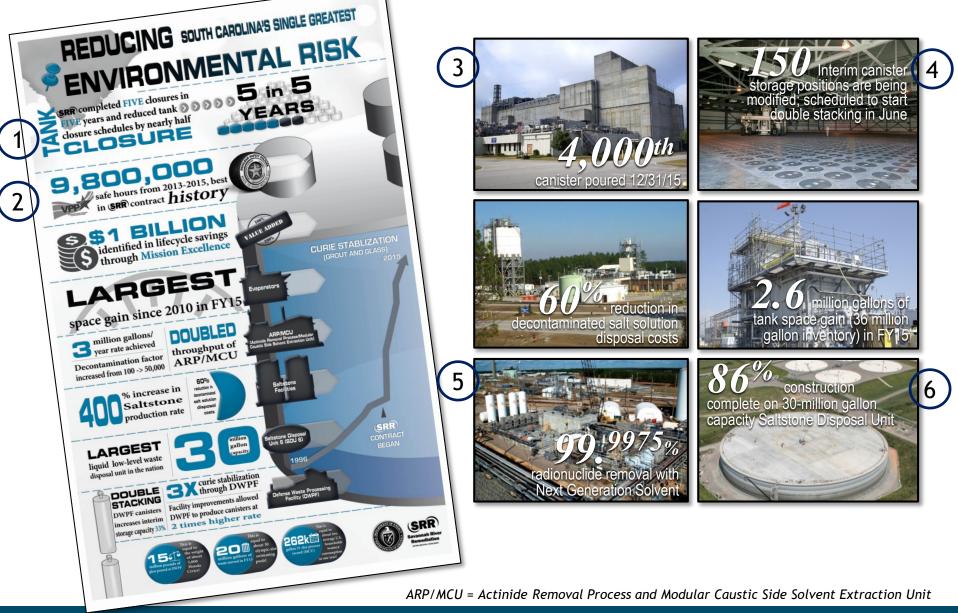
#### Safety: Perspective/Awards

- Construction forces (legacy and current) accumulated over 28 million safe hours
- SRR operations accumulated over 1 million safe hours since the last injury requiring a day away from work
  - Reached contract-high 9.8 million safe hours in 2015
- Recipient of National and State Awards in recognition of safety performance (National Safety Council Industry Leader, S.C. Chamber of Commerce and S.C. Department of Labor, Licensing and Regulation Awards)





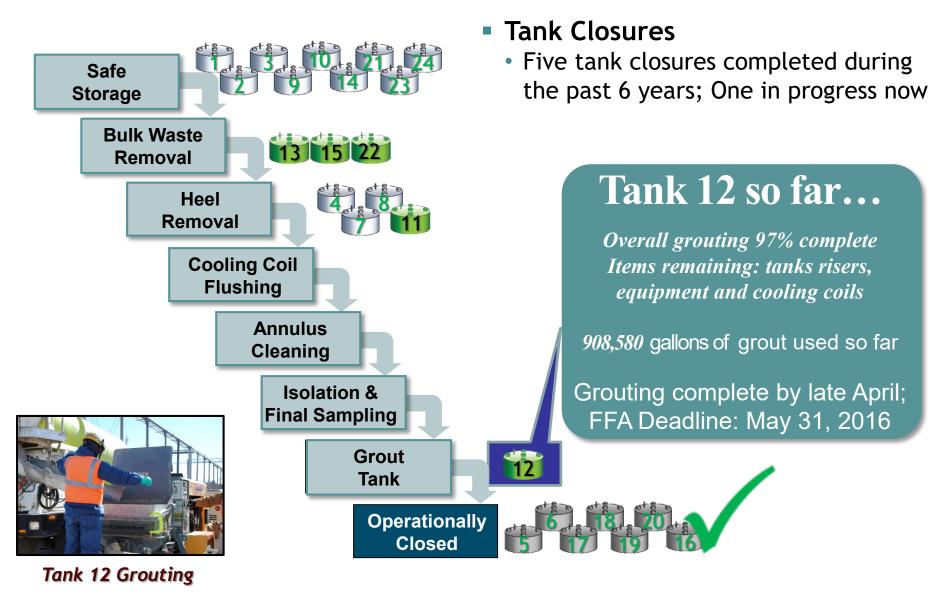
### **High-Hazard Operations**



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### **Closing Waste Tanks**



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- 3H Evaporator Mission: Evaporating liquids generated during:
  - Sludge batch washing
  - Receipts from H Canyon
  - Tank waste removal and cleaning
- Leak discovered on Feb 17, 2016, contained in stainless steel lined cell
- System Plan revision supports continued H Canyon, DWPF, and MCU operations for up to 3 years without 3H Evaporator operating

#### Strategy

- Currently feeding Sludge Batch 8 to DWPF
- Sludge Batch 9 has already been washed
- Sludge Batch 10 washing was to have begun in March 2017, will be deferred
- Insertion of a Sludge Batch 9B (Tank 22 does not require washing)
- Decrease canister loading from 36 wt% to 32 wt% (ensures no "salt only" processing at end of campaign)
- Estimate for evaporator replacement is 3 years and ~\$18M
- Recovery Teams evaluating repair vs. replacement



# SRR Technical Issue: SDU 6

#### Leak Repairs

- 30 million gallon construction
- Unable to pass water-tightness test with dye
- Install a liner
- Retest tank
- Under budget
- On track to meet system plan need date







### Infrastructure Improvements

| ✓ Mercury Scoping  | ✓ Slurry Mix Evaporator Condensate Tank (SMECT)   | ✓ Replace Flush Water Valves V-13 & 19  | ✓ 3 Tank Vent Reheater Replacements                                   |
|--|---|---|---|
| <ul> <li>Slurry Mix Evaporator (SME) Bubbler improvement</li> </ul>  | Sample Pump DCS   | <ul> <li>Install new independent SHT sampler to reduce</li> </ul>             | ✓ 4 Ducts Replacements  |
| ✓ Coils Inspect/Clean  |   | organic cross-contamination   | V 2 Stacks Extensions   |
| <ul> <li>Sludge Receipt and Adjustment Tank (SRAT)/SME</li> </ul>  | Shelded Conister Transporter (SCT) zero level   | hed to lengthen   | Tk 15 New HEPA House  |
| Blowdown Auto  | Δ ΙΟΤ ΛΓΓΟΜΟΙΙS   | Πρη τη Ιρηστηρη   | Ce HDB-8 Crane Wire Rope  |
| ✓ Melter Off-gas restoration   |   |   | Repair Tank 38-43 Transfer Line Jacket                                |
| <ul> <li>Lab Motor Control Center separation</li> </ul>  | Rev. E Documented Safety Analysis (DSA) purge mods  | ✓ 6 Reel Tape Repairs   | <ul> <li>Integrity inspection of MCU cell coating</li> </ul>          |
| ✓ New Laboratory trailer   | Liferade 3 Capister Decentramination Cell Decon   | a roliability of  | C Digree 37 Salt Dissolution  |
| <ul> <li>New Instrument air dryers</li> </ul>  | The and increas   | se reliability of   | MCS Coalescer filter replacement                                      |
| ✓ New cooling tower pumps  | <ul> <li>Four pump noses</li> </ul>   |   | ion evaporator feed pump repair                                       |
| ✓ Obsolete acid pumps replacement  | Saltstone core sampling   | ✓ Relocate HLLCPs   | <ul> <li>Installed new SS diesel generator for H-Diversion</li> </ul> |
| <ul> <li>✓ Smear Test Station Exit Pedestal Refurbishment</li> <li>✓ Vault 4 cap &amp; roof coating</li> </ul>     | Liquid Wacto to   | icilities more to   | DX INDD)-6 (SS)   |
| $\checkmark$ Basin 4 expansion   | LIQUIU WUSLE 10   | icilitiesmore to  | 1 ✓ Repared the Inter-Area Transfer Line (IAL)                        |
| ✓ SDU fill height increase   | <ul> <li>✓ Evaluate elimination of cement from Saltstone recipe</li> </ul>  | <ul> <li>Replaced three cooling towers at ETF</li> </ul>                      | transfer pump   |
| ✓ Saltstone Disposal Unit (SDU) 6 construction   | <ul> <li>✓ Decon frit valves replacement</li> </ul>   | ✓ Replaced the Tank 48 purge ventilation ductwork                             | ✓ MCU caustic wash mods   |
| ✓ Salt Solution Receipt Tanks construction   | ✓ Melter bubbler replacements   | (SS)  | <ul> <li>MCU Intek flow meters</li> </ul>                             |
| ✓ Weigh hopper weather protection  | ✓ Purge system modifications (SC)   | <ul> <li>Replaced Tanks 1, 3, 7 and 8 purge ventilation fans</li> </ul>       |   |
| ✓ Wireless infrastructure installation at Saltstone  | ✓ 512-S secondary filter modifications  | (SC)  |   |
| ✓ Delta V control system upgrade   | ✓ 512-SW cross flow filter redesign   | ✓ Replace Tanks 1, 2, 3, 9, 10 and 23 purge                                   | B   |
| ✓ Replaced 4 obsolete fire system monitoring panels  | ✓ Saltstone Mixer refurbishment   | ventilation reheaters (SC)  |   |
| ✓ Lab flooring   | ✓ Salt feed tank downcomer  | ✓ Removal (D&R) of the 704-8H trailer   | Tank Farms  |
| ✓ FOS 7 and FOS 18 HVAC units  | ✓ PVV Mercury Transfer Header flush   | ✓ Inter-Area transfer line repairs  |   |
| ✓ Replace obsolete Moore Controllers   | ✓ PVV jumper cleanouts  | ✓ Installed 15 ARGOS Monitors   |   |
| Breathing Air manifolds  | SCT uninterruptable power supply  | C Example Text of UDC   |   |
| ✓ Grout line replacement   | Refield CPC purge air filter sight glasses  | <ul> <li>✓ Functional Test of UPS</li> <li>✓ Rebuild Tk 30/37 BFVs</li> </ul> | S ✓ 3H Deliqouring<br>S ✓ PT-1 Pump Repair                            |
| <ul> <li>Elimination of cement from Saltstone recip</li> <li>Saltstone Disposal Unit (SDU) 6 constructi</li> </ul> | Y     Process frit line cleanout capability       MFT feed pump VFD   | ✓ Rebuild 2H Feed Pump  | Replace DB-8 DG   |
| • Satistone Disposar Onic (SDO) & constructing   | PVV blower VFD  | ✓ Perform 20 Instrument PMs on 3H   | Install MCU rain cover  |
|  |   | — ✓ Perform Cooling Tower PMs   | Restore Tank 22 Mixing Capabilities                                   |
| ✓ Lab flush 3-way valve ₹  | 🖌 🞖 🗸 SMECT pH probe  | ✓ Rebuild Cooling Tower Pump(s)   | ✓ Building Replacement Type III and IIIA TTJs                         |
| ✓ Lab cell winch & hoist   | Process Steam Generator Level   | ✓ Repair 2H/3H Steam Leaks  | ✓ Replace Tank 41 Transfer Pump                                       |
| ✓ Diesel Generator 100 Loss of   | Indicating Transmitter  | ✓ Replace DSS coalescer and pre-filter  | ✓ Replace Tank 4 Transfer Pump and Install valve                      |
| Power Surveillance   | Cold Feed Vent  | ✓ Replace SE coalescer  | flushing manifold   |
| ✓ Melter off-gas Surveillance  | SRAT scrubber valve   | ✓ Replace MCU PVV HEPA filters  | ✓ Tank 37 Back flush valve replacement                                |
| ✓ SRAT/SME interlock Surveillance  | ✓ SME Agitator jumper   | ✓ Perform annual PMs/CMs for electrical, instruments                          | ✓ HDB4 valve repairs and actuator upgrades                            |
| ✓ B8 5 Year Preventive Maintenance (PM)  | <ul> <li>Interim Canister Closure Station heater</li> </ul>   | and HVAC  | <ul> <li>Procurement of 3 Slurry Pumps, 5 SMPs &amp; 6</li> </ul>     |
| ✓ Lab cell window cleaning   | ✓ AA2 Agitator  | Replace Tank 49 Transfer Pump     Repair Underground Domestic and Well Water  | CSMPs<br>✓ Completed cleanout of Leak Detection Box (LDB)             |
| <ul> <li>✓ Field Operating Station PMs</li> <li>✓ Grout process lines</li> </ul>                                   | <ul> <li>✓ SME Scrubber</li> <li>✓ Melter Transformer</li> </ul>  | <ul> <li>Repair Underground Domestic and Well Water<br/>Leaks</li> </ul>      | ✓ Completed cleanout of Leak Detection Box (LDB)<br>Drain Cell        |
| <ul> <li>✓ Grout process lines</li> <li>✓ Chute inspections</li> </ul>   | ✓ Metter Transformer<br>✓ SME transfer pump   | ✓ Repair Chromate Water Pumps   | <ul> <li>✓ Removed temporary modification from F-Catch</li> </ul>     |
| <ul> <li>✓ Pig valve refurbishment</li> </ul>  | <ul> <li>✓ Frit Slurry Makeup Tank sparger</li> </ul>   | <ul> <li>Replace 3H Building Vent Fan and VFD</li> </ul>                      | Tank  |
| ✓ Vault 4 weather enclosures   | ✓ Fire System Valve   | <ul> <li>Replaced Tank 43 Feed Pump</li> </ul>                                | ✓ Installed new air compressors at 241-58H and                        |
| ✓ 512-S valve repairs  | ✓ Outfall Soil Removal  | ✓ Salt Dissolution in Tank 37   | HDB-8   |
| ✓ Improve spare parts availability   | ✓ Victaulic valve covers  | ✓ Modified Tank 39 Transfer Jet   | ✓ Reestablished stream to the Tank 43 Transfer Jet                    |
| ✓ Load center preventive maintenance   | ✓ Saltstor Control room alarm roduction   | ✓ Reduced the Corrective Maintenance  | ✓ MCU duct replacement with flush capability                          |
| ✓ Steam system repairs   | Saltstor Focus on:  | ✓ Backlog for SS/SC items   | <ul> <li>Tank 32 Feed Pump diamond bearings</li> </ul>                |
| <ul> <li>Flush water to grout line valve repair</li> </ul>   | ✓ Fire pump rebuilds  | ✓ Replaced 15 conductivity probe junction                                     | <ul> <li>Tank 37 Transfer Jet</li> </ul>                              |
| <ul> <li>Film cooler and quencher cleaning</li> </ul>  | Clean Condition Clean Condition   | ion improvements  | <ul> <li>MCU PVV shielding</li> </ul>                                 |
| Manipulator arm spare parts  | <ul> <li>Grout pump motor support</li> <li>Metter Sell aux Work Around remova</li> </ul>  | ✓ Repaired jacket for the Tank 38 gravity drain line                          |   |
| ✓ Reduced Corrective Maintenance Backlog for SS/SC<br>items  |   | (GDL)   |   |
| items<br>✓ SC-1 pump return to service (Spare)   | <ul> <li>SRAT condenses temperature indication</li> <li>DWTT condens Maintenance of Safet</li> <li>Metr conductation loser</li> </ul> | ty System/Safety Class items  |   |
| ✓ TB-6 pump return to service (Spare)  | ✓ MFT recirculation loop insert   | Unplugged Drain Line for HDB-2  |   |
| i b o panip recuri co service (spare)  | <ul> <li>MFT recirculation loop insert</li> <li>Lab drain jump and transfer capabili</li> <li>Gas Chromotographs MCP</li> </ul>       | tV  |   |
| DW/DE/Caltatona  | ✓ Gas Chromatographs NCR  | ✓ Fabricated a spare Type III Telescoping Transfer                            |   |
| DWPF/Saltstone   | Gas Chromatographic bility improvem   | ents Jet  | Completed in FY14   |
|  | ✓ 13 Ton motor on main canyon crane   |   | Continued /Coimpleted in FY15   |
|  |   |   | Completed in FY15   |
|  |   |   | Continues in FY16   |

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### **Canister Double Stack Update**

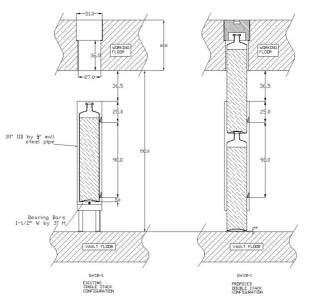
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#### Canister Double Stack Project

- Work includes:
  - Modify existing locations to store two canisters each (from 2,254 to 4,508)
  - Remove existing crossbar canister support; lower canister supported on vault floor
  - Upper canister placed on top of lower canister
  - Upper canister Shield plug redesigned for equivalent radiological protection
  - Scheduled to begin double stacking in June



#### Canister Double Stack



02.28.2002



### **Two Projects:** No MST Demonstration / Salt Solution Receipt Tanks

- No MST Demonstration
  - SRR team continues to refine the system used to process salt waste
  - Eliminating the addition of monosodium titanate (MST) from the salt waste processing system improves ARP filtration rate
  - Successfully processed approximately 200,000 gallons of the salt waste to date
  - Demonstration will continue for several more months





SSRT under construction

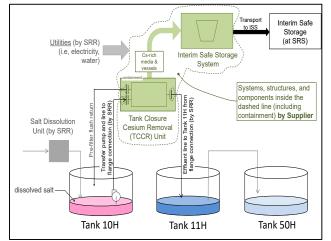
SSRT construction complete

- Preparing for Salt Waste Processing Facility
  - In May, one of the two newly constructed Salt Solution Receipt Tanks (SSRT) will begin a Readiness Review
    - There are two 60,000-gallon SSRTs
    - Provides 4 days of space for salt operation
  - Liquid waste-wide outage June-September 2017
    - Install underground transfer lines for SWPF tie-ins



## Tank Closure Cesium Removal

- Objective
  - Pursue ion exchange technology to enhance tank closure capabilities
  - Leverage commercial ion exchange supplier expertise and Fukushima experience
  - Improve flexibility by exploring alternatives for spent resin disposal
  - Simple, modular, affordable



#### Status

- Best & Final Offer Request for Proposal sent to Suppliers
- Final Proposals received
- SRR Proposal evaluation complete 2/18/16
- TCCR Subcontract Award

TCCR Concept



**TCCR Process Area** 



#### Focus continues on

- Safe work to protect workers, public, environment
- Close Tank 12 by May 31, 2016
- Continue salt waste processing with ARP/MCU > 1M gallons per year
- Prepare for Salt Waste Processing Facility startup
- Innovative SRR Team continues to provide unique solutions to the liquid waste work
  - No MST demonstration
  - Canister double stack
  - Tank Closure Cesium Removal
  - Many others

#### Questions?





