Tank Closure Program at Savannah River Site

Governor’s Nuclear Advisory Council

June 11, 2009

Presentation By
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Department of Energy Savannah River Operations Office
Acronyms

• DOE – Department of Energy
• EPA – Environmental Protection Agency
• NRC – Nuclear Regulatory Commission
• PA – Performance Assessment
• SCDHEC - South Carolina Dept. of Health and Environmental Control
• WD – Waste Determination
Objective: Empty, clean, and stabilize residual contaminants to meet commitments for tank closure and protect human health and the environment.

Scope: Two Tank Farms (51 tanks, various equipment and underground transfer lines)
Progress Made

• **Phase I - Bulk Waste Removal**
  – 7 Tanks completed (Tanks 17, 20, 18, 19, 5, 6, and 16)
  – 2 Tanks underway (Tank 12 and 4)
  – Commitments to complete 17 non-compliant tanks by 2019

• **Phase II - Heel Removal & Tank Cleaning**
  – 4 Tanks actively underway
    • Mechanical Cleaning Tanks 18 and 19
    • Chemical Cleaning Tanks 5 and 6
  – Continue until DOE, SCDHEC & EPA agree to cease

• **Phase III - Characterize residual**
  – Prepare closure documentation

• **Phase IV – Grout**
  – 2 Tanks completed (17 and 20)
  – Commitments to close 24 non-compliant tanks by 2022
  – Anticipate closure of remaining 27 compliant tanks by ~ 2028
Tanks 18 and 19 Mechanical Heel Removal and Cleaning (Mantis®)

- Three Phase cleaning strategy per tank
  - Mound Removal
  - Floor using hose
  - 10 Area Validation
Tanks 18 and 19 Mechanical Heel Removal and Cleaning (cont’d)

• Each tank cleaned >400 hours
• ~ 1/4” – 1/2” vacuum design limitation
• Tank 19 stiffener bands hydrolanced (1200 psi) similar to Tank 18
Tanks 18 and 19 Results

Tank 18
4/28/09

Tank 19
## Tanks 18 and 19 Results (Cont’d)

<table>
<thead>
<tr>
<th></th>
<th>Tank 18</th>
<th>Tank 19</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Mantis</strong></td>
<td>6,730 gallons 98% curies removed</td>
<td>16,800 gallons 92% curies removed</td>
</tr>
<tr>
<td><strong>Post Mantis</strong></td>
<td>~1,100 gallons (preliminary)</td>
<td>~1,100 gallons (preliminary)</td>
</tr>
<tr>
<td><strong>% Removed</strong></td>
<td>~ 84% volume (preliminary)</td>
<td>~ 93% volume (preliminary)</td>
</tr>
<tr>
<td><strong>PA bases</strong></td>
<td>1,100 gallons</td>
<td>3,800 gallons</td>
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Comparison of Public Dose Risks

Current federal exposure limit

Closure performance objective

F Tank Farm peak dose
Tanks 5 and 6 Chemical Cleaning

- Three (3) oxalic acid strikes and water wash
  - Acid radionuclide concentration decreased
  - Solid volume increased in both tanks during final acid strikes and believed to be non-radioactive sodium and/or iron oxalates
  - In-process solid samples at lab for analysis
- Failed coils flushed in both tanks
- Annulus wall cleaning 100% complete Tank 6, 75% complete for Tank 5
- Solid sample analysis currently in progress
Path Forward

• Continue bulk waste removal and treatment
• Near term focus on F Tank Farm closure:
  – SCDHEC and EPA concurrence to cease waste removal for Tanks 18 and 19 ~ July 2009
  – Contractor recommendation on Tanks 5 and 6 soon
  – Issue Draft F Tank Farm Closure Plan to SCDHEC and EPA in Fall 2009
  – Issue Draft F Tank Farm WD Basis, revised PA, and PA comment responses to NRC, SCDHEC, EPA, and public by Spring 2010
Back-up
Bulk Waste Removal

Treat and disposition via:
Interim Processing and Salt Waste Processing Facility

Salt Supernate
223 Million Curies

Saltcake
203 Million Curies

Defense Waste Processing Facility

Sludge

EM
Environmental Management

Safety • Performance • Cleanup • Closure
SRS Liquid Waste Tanks

Type I Waste Tank
- 750,000 gal
- 12 Tanks
- Built 1951 - 1953
- Non-Compliant
- Only 5 foot Secondary

Type II Waste Tank
- 1,030,000 gal
- 4 Tanks
- Built 1955 - 1956
- Non-Compliant
- Only 5 foot Secondary

Type III Waste Tank
- 1,320,000 gal
- 27 Tanks
- Built 1967 - 1981
- Compliant
- Full Secondary

Type IV Waste Tank
- 1,320,000 gal
- 8 Tanks
- Built 1958 - 1962
- Non-Compliant
- No Secondary
Commitments

- Appendix L of the Federal Facility Agreement between DOE, SCDHEC and EPA effective 11/19/07
- F Area Tank Farm PA to SCDHEC and EPA by 8/31/08 (Complete)
- H Area Tank Farm PA to SCDHEC and EPA by 3/31/11
- Bulk Waste Removals:
  - 2 tanks by 9/30/10
  - 1 tank by 9/30/11
  - 2 tanks by 9/30/14
  - 2 tanks by 9/30/16
  - 3 tanks by 9/30/17
  - 6 tanks by 9/30/18
  - 1 tank by 9/30/19
- Clean Tanks until DOE, SCDHEC and EPA agree to cease
  - Remove up to 75% of residual volume from Tanks 18 and 19 between 6/30/09 and 9/30/09
- Tank Closures (grouted)
  - Tanks 18 and 19 by 12/31/12
  - 4 Tanks by 9/30/15
  - 2 Tanks by 9/30/17
  - 2 Tanks by 9/30/19
  - 5 Tanks by 9/30/21
  - 7 Tanks by 9/30/22
Sand Mantis®

Tank Insertion
- lower platform into tank
- extend wheel housing

Transfer Line

Tilt Wheel

Umbilical Line
(Contains Hydraulic, HP and UHP Hoses)

Eductor

Discharge Line

Cable Cutter

Suction
Process for Decision Making
F-Tank Farm All-Pathways Peak Dose for 20,000 Years

Peak dose within 20,000 years still well below performance objective

10,000-year Compliance Period