Salt Waste Processing Facility Project

SRS Citizens Advisory Board Meeting
January 2009

Zack Smith
Federal Project Director
SRS Liquid Waste System

SRS Tank Farms
397 MCi (100%)

DWPF - Defense Waste Processing Facility

Federal Repository
396 MCi (>99%)

Vaults

Saltstone

0.2 MCi (0.05%)

SWPF – Salt Waste Processing Facility

EM Environmental Management

safety ★ performance ★ cleanup ★ closure
Liquid Waste Background

- Volume:
  - Salt Supernate: 33.5 Mgal (92%)
  - Saltcake: 3.0 Mgal (8%)
  - Sludge: 36.5 Million Gallons (Mgal)

- Curies:
  - Salt Supernate: 212 MCi (54%)
  - Saltcake: 185 MCi (46%)
  - Sludge: 397 Million Curies (MCI)

EM Environmental Management

- Safety
- Performance
- Cleanup
- Closure
CSSX Process

Cs Waste Feed

Extraction Contactors – 16 Stages

Cs Laden Solvent

High Cs Strip Effluent Hold Tank

2-Stage Scrub

Scrub Solution (Nitric Acid)

Extraction Contactors – 16 Stages

Strip Solution (Nitric Acid)

High Cs Strip Effluent

To Saltstone <0.001 Ci/gal

Solvent Hold Tank

2-Stage Caustic Wash

Caustic Wash Tank

To DWPF

EM Environmental Management

safety  performance  cleanup  closure
SWPF Contactor

Environmental Management

- safety
- performance
- cleanup
- closure
SWPF Project Layout
**Annual Funding Requirements**

<table>
<thead>
<tr>
<th></th>
<th>Current Funding</th>
<th>Funding Profile</th>
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<tbody>
<tr>
<td>Through 2008</td>
<td>$364</td>
<td>$364</td>
</tr>
<tr>
<td>2009</td>
<td>$141</td>
<td>$164</td>
</tr>
<tr>
<td>2010</td>
<td>$154</td>
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<td>2011</td>
<td>$132</td>
<td>$292</td>
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<tr>
<td>2012</td>
<td>$85</td>
<td>$203</td>
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<tr>
<td>2013</td>
<td>$24</td>
<td>$58</td>
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EM Environmental Management

- safety
- performance
- cleanup
- closure
Open SWPF Project Risks

- Confidence Factor: $97.71M
- Cold Commissioning Only Risks: $10.2M
- Construction Only Risks: $83.78M
- ARP/MCU Risks: $41M
- Risks for Both Construction and Cold Commissioning: $42.31M

Total SWPF Open Risks: $275M
Open Post Construction SWPF Program Risks

- Waste Characterization Risks Affecting SWPF Througput $512M
- SWPF Operations Risks Affecting SWPF Througput $476M
- Tank Farm and DWPF Operations Risks Affecting SWPG Throughput $1,462M

Total Post Construction SWPF Program Risks: $2.45B

Environmental Management

- safety
- performance
- cleanup
- closure
Overall Project Status

- 90% design completion review completed.
- Started limited construction and early procurements September 2007.
- Deputy Secretary approved all construction work December 8, 2008.
- Current activities:
  - Basemat construction underway
  - Basemat rebar installation more than 50% complete
  - Drain pipe installation in basemat slab approximately 25% complete
  - Actinide Sorption Drain Tank and Waste Transfer Enclosure basemat concrete slab complete
Central Processing Area
Looking East-Northeast
Conduit installation in Placement 4 (1/5/09)
Installation of embed plates in ASDT Cell (1/2/09)
Temperature probes (thermocouples) installed in placement #8 (12/23/08)
• BACKUP
Construction Materials

- Tons of reinforcing steel – 4,600
- Tons of steel – 3,300
- Cubic yards of concrete – 40,000
- Miles of pipe - 23
- Number of remote actuated valves – 600
- Number of tanks - 75
Construction Labor

– Carpenters – 60
– Electricians – 80
– Ironworkers – 50
– Laborers – 30
– Pipefitters/Welders – 180
– 400 Craft for 21 months
Operations Personnel – Facility Operations

– Engineers and Managers – 35
– Operators – 40
– Laboratory – 20
– Maintenance/Work Control – 35
– Radcon/Safety/QA – 25
– Support Staff – 30
– Total estimated at 185 FTE during operations
## CD-2 to CD-3 Changes in Costs ($M)

CD-2 Approved Baseline (based on 25 – 35% design) $900

<table>
<thead>
<tr>
<th>Baseline Cost Increase Contributors</th>
<th>$</th>
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<tr>
<td><strong>Contingency</strong> <em>(new risks, increasing risk impacts as identified by the EIR team, and DOE Complex/WTP Lessons Learned)</em></td>
<td>186</td>
</tr>
<tr>
<td><strong>Engineered Equipment</strong> <em>(high escalation realized through vendor bids, industry-wide issues including loss of vendor pool, increased cost to address design evolution including NQA-1 performance requirements and upgrades. Approximately $18M of these costs were associated with increased materials due to design evolution)</em></td>
<td>75</td>
</tr>
<tr>
<td><strong>Construction</strong> <em>(increased installation labor to address design evolution, increased cost of staff due to industry competition, increased Foreman ratio)</em></td>
<td>66</td>
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<tr>
<td><strong>Construction Support</strong> <em>(increased labor to address design evolution quantity increase &amp; support needs, project duration increase, additional staff to address Early Construction and DOE Complex/WTP lessons learned)</em></td>
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<tr>
<td><strong>Engineering and Design</strong> <em>(extension of project schedule, design evolution beyond plan, realized risk of design resource shortage)</em></td>
<td>28</td>
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<td><strong>Commissioning and Support</strong> <em>(increased project duration/delay costs)</em></td>
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<td><strong>DOE Support</strong> <em>(increased duration/delay costs)</em></td>
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<td><strong>Changes to CD-2 Approved Baseline</strong></td>
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**Total Project Cost** $1,339
### ISDP Tank 49 Solution Processing

**Legend**
- **Blue**: Cumulative Tank 49 Solution Processed
- **Orange**: Cumulative Tank 49 Solution Scheduled to Support System Plan to date

**Data**

<table>
<thead>
<tr>
<th>Data</th>
<th>Mar-08</th>
<th>Apr-08</th>
<th>May-08</th>
<th>Jun-08</th>
<th>Jul-08</th>
<th>Aug-08</th>
<th>Sep-08</th>
<th>Oct-08</th>
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<tbody>
<tr>
<td>Cumulative Tank 49 Solution Processed</td>
<td>-</td>
<td>3,679</td>
<td>25,584</td>
<td>40,145</td>
<td>61,969</td>
<td>126,630</td>
<td>141,925</td>
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<tr>
<td>Cumulative Tank 49 Solution Scheduled to date</td>
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<td>3,300</td>
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<td>48,096</td>
<td>71,651</td>
<td>95,207</td>
<td>118,002</td>
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<tr>
<td>Cumulative Goal Status</td>
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<td>Green</td>
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<td>Green</td>
<td>Blue</td>
<td>Blue</td>
<td>Blue</td>
<td></td>
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</table>
SWPF Decontamination Salt Solution
Cesium Concentration Levels (Ci/gal)

Note: ARP/MCU Design Decontamination Factor of 12 Based on Number of Contactors
SWPF Design Decontamination Factor of 40,000 Based on Number of Contactors
Cesium Decontamination Factors

Note: ARP/MCU Design Decontamination Factor of 12 Based on Number of Contactors
SWPF Design Decontamination Factor of 40,000 Based on Number of Contactors
Open SWPF Project Risks ($M)

Risks for Both Construction and Cold Commissioning

- DOE Federal Staffing Insufficient to Support Project ($10.5M)
- Subcontractor/Vendor Unsatisfactory Performance ($10.5M)
- Supplemental Analyses/Testing Required due to Oversight Process Issues ($8.5M)
- Site Interface Problems ($6.25M)
- Labor Forward Procuring Rates Prove Inadequate for Project ($3.66M)
- Errors, Omissions, and Change to the Project Baseline ($2.9M)
- Material, Subcontract, Equipment, and Fabricated Component Escalation ($18.6M)
- Design Rework During Construction due to Design Changes Post CD-3 ($15.3M)
- Limited NQA-1 Qualified Vendors ($9.9M)
- Construction Productivity is Less Than Assumed in Baseline ($9.1M)
- DOE Fiscal Year (FY) Funding Issues ($7.5M)
- Cyber Security Imposed on EPC ($5.7M)
- WACs for DWPF & SPF don’t support Full Capacity SWPF Operations ($4M)
- Labor Shortages ($3.5M)
- Loss of Key Personnel ($3.5M)
- Unforeseen Safety Accident/Incident (SWPF Specific) ($3.5M)
- Weather Delays Impact Construction Activities ($1.88M)
- Regulatory Interface Requirements are Greater Than Assumed ($1.3M)
- Resolution of ORR Findings ($8M)
- General Equipment Failures ($2.2M)
- ARP/MCU Testing Requires SWPF to add Coalescer ($12M)
- ARP/MCU or Waste Characterization Info Differs from Baseline ($29M)
- 80% Confidence Factor ($37.98M)
- 95% Confidence Factor ($59.73M)
Open Post Construction SWPF Program Risks ($M)

- Heel and Annuli Waste Cannot Be Processed Through SWPF - Risk #42 ($337M)
- Rogue Feed Constituents Affect SWPF Decontamination Factor and Throughput - Risk #70 ($112M)
- Salt Feed Chemical or Radiological Changes Result in Feed That Does Not Meet SWPF WAC - Risk #77 ($37M)
- Feed Criticality Issues Reduce SWPF Throughput - Risk #101 ($26M)
- SWPF Operational Risks Reduce Attainment - Risk #168 ($225M)
- SWPF Not Available in September 2012 - Risk #205 ($225M)
- SWPF Commissioning and 1Yr Operations Risk - SWPF RAMP ($26M)
- Infrastructure Modifications Not Complete to Support SWPF Startup - Risk #245 ($112M)
- Tank Farm Infrastructure Does Not Support SWPF Operations - Risk #90 ($450M)
- Close Coupling between SWPF and Other Facilities Limits SWPF Throughput - Risk #91 ($900M)

NOTE: Risk numbers indentified are associated with PBS-14 Risk Management Plan

Total Risk Value = $2.45B

Risk Titles, IDs, and Most Likely Impact

- Waste Characterization Risks Affecting SWPF Throughput
- SWPF Operations Risks Affecting SWPF Throughput
- Tank Farm and DWPF Operations Risks Affecting SWPF Throughput