Update on H Area Operations

Allen Gunter
DOE-SR Senior Technical Advisor

Savannah River Site Citizens Advisory Board
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To satisfy Nuclear Materials Committee Work Plan by:

• Providing an update on H Area Operations
  - Conduct of Operations improvements
  - H Canyon – Legacy Transuranic (TRU)
  - Plutonium (Pu) processing for the Mixed Oxide Fuel Fabrication Facility (MFFF)
  - Spent Nuclear Fuel (SNF) Disposition via H Canyon
<table>
<thead>
<tr>
<th>Acronyms</th>
<th>Descriptions</th>
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<tbody>
<tr>
<td>AI – clad</td>
<td>Aluminum clad</td>
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<tr>
<td>AROD - Amended Record of Decision</td>
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<tr>
<td>ARRA - American Recovery and Reinvestment Act</td>
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<td>DSA - Documented Safety Analysis</td>
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<tr>
<td>HEU - Highly Enriched Uranium</td>
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<td>HFIR - High Flux Isotope Reactor</td>
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<td>MFFF - Mixed Oxide Fuel Fabrication Facility</td>
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<td>MOX - Mixed Oxide</td>
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<tr>
<td>MTR – Material Test Reactor</td>
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<td>NNSA - National Nuclear Security Administration</td>
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<tr>
<td>Pu – Plutonium</td>
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<td>SA - Supplement Analysis</td>
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<td>SNF - Spent Nuclear Fuel</td>
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<td>SRE - Sodium Reactor Experiment</td>
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<td>SRNS - Savannah River Nuclear Solutions</td>
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<tr>
<td>TRU - Transuranic Waste</td>
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<td>TSR - Technical Safety Requirements</td>
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<td>U – Uranium</td>
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<td>WIPP - Waste Isolation Pilot Plant</td>
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Conduct of Operations Improvement

- On 4/18/13 SR issued a letter to Savannah River Nuclear Solutions (SRNS) stating its concern with the status of conduct of operations in its facilities.

- No eminent safety issues identified, concern due to upward trend in conduct of operations incidents.

- SRNS submitted a Corrective Action Plan to SR on 5/20/13 with a revision on 6/14/13.

- Over the past several of months, the facilities implemented numerous corrective actions to improve its disciplined operations.

- SR has seen a improvement in the conduct of operations in the facilities and will continue to evaluate SRNS’s continuing progress.
H Canyon – Legacy TRU

- Remediating legacy TRU waste for past 7 years in the H Warm Canyon…accelerated over the past few years with American Recovery and Reinvestment Act (ARRA) funding
- Rendering to achieve Waste Isolation Pilot Plant (WIPP) certification
- H Canyon processing some of the most radiologically challenging materials (Large Steel Boxes, Concrete Vaults, etc.)
- Expect to complete remediation of legacy waste in Fall 2013
In November 2011, National Nuclear Security Administration (NNSA) assigned H Area a mission to produce Pu oxide feed for MFFF from non-pit material stored in K Area:

- Prepare H-Canyon/HB-Line and support facilities for startup to produce plutonium oxide to meet MFFF feed specs
- Reconfigure process operations to allow for full ramp up to 1 MT oxide production rate
- Develop/Implement all required safety basis documentation and required modifications, including implementation of DOE Std 3009 complaint DSA/TSR for HB-Line
Pu Oxide Production Flowsheet

Pu Material from K-Area

HB-Line Phase III
- Unload 9975
- Remove 3013 and Repack

Dissolver
- Dissolvable Cans

Waste Tanks
- Filtrate Waste

H-Canyon
- Product Tanks
- Column Waste

HB-Line Phase II
- Purify
- Precipitate
- Oxide Conversion
- Product Packaging

H-Tank Farm

Pu Oxide to K-Area
Plutonium processing for Mixed Oxide Fabrication Facility

Progress/Current Status:

- Completed multiple safety basis changes, procedure changes, training, etc.
- H Canyon began dissolution of non-pit Pu in January 2013
- HB-Line DSA/TSR changes for oxide production have been approved by SRNS and SR.
- SRNS completed its HB-Line Readiness Assessment the week of August 5th
- SR began its HB-Line Readiness Assessment August 12th and plans to complete it this week
- Assuming a favorable review, facility will begin implementation of the DSA/TSR requirements and begin oxide production in early October
H Canyon – “Vulnerable” SNF Disposition

• Continuing the disposition of Sodium Reactor Experiment (SRE) SNF Fuel

• Although no current issues with SRE in L Basin storage, it is considered more “vulnerable” to long term wet storage

• SRE and other Hi Al/Low U SNF campaigned as a blend to mitigate viscosity issues of thorium-based fuel (SRE) in caustic solution

• Disposition of resulting solution directly to sludge batch tank

• Expect to complete campaign in Spring 2014
H Canyon – Spent Fuel Disposition

• DOE approved an Supplement Analysis (SA) and Amended Record of Decision (AROD) to allow the processing of a limited amount of enriched uranium Aluminum clad (Al-clad) SNF.
  - 1000 MTR Bundles
  - 200 HFIR Cores
• Upon completion of the SRE campaign in Spring 2014, SRS will proceed directly with processing al-clad enriched uranium SNF.
• SNF will be dissolved, uranium recovered, purified, down blended, and shipped for use at Tennessee Valley Authority (TVA).
• Processing will only generate approximately 35 glass canisters.
Summary

- H Canyon Complex remains a unique national asset for large scale nuclear materials processing
- Maintaining operator proficiency/equipment operability
- Made improvements in conduct of operations
- Continuing Legacy TRU remediation with planned completion in Fall 2013 (Allows waste to leave South Carolina)
- Completed facility preparations for the startup of Pu oxide production
- In process of performing readiness reviews for Pu oxide production with plans to begin oxide production in October 2013
- Plan to complete SRE campaign in Spring 2104
- Proceed with processing Highly Enriched Uranium (HEU) Al-clad SNF immediately after completion of SRE