West Valley Demonstration Project
High-Level Waste Management

Bryan Bower, DOE Director – WVDP
DOE High-Level Waste Corporate Board Meeting
Savannah River Site
April 1, 2008
To solidify the radioactive material from approximately 600,000 gallons of high-level radioactive waste into a durable, high-quality glass, both a pretreatment system to remove salts and sulfates from the waste and a vitrification system/process were designed.

**Waste Pretreatment**
- Liquid
  - Remove 99.9% of Radioactivity
  - Concentrate Liquid
  - Blend with Cement
  - Store the Cement-filled Drums

**Sludge**
- Mix Sludge/Zeolite
- Heat with Glass Formers
- Store Canisters

**HLW Liquid**
- Zeolite
- To Vitrification

**Transportation (Pending EIS)**
- Terminal Waste Storage

**High-level Waste Vitrification**
West Valley High-Level Waste

Pretreated LLW Disposal – BIG Success!

1988 – 90  Removal of salts from liquid portion of waste in underground waste tank (8D-2)

1991 – 95  Sludge washing operations to remove salts and sulfates

Total operations processed 1.7M gallons of low-level salt solution into 19,877 drums of cemented LLW that were placed in storage in the Drum Cell

2006 – 07  LLW drums safely removed and successfully shipped to Nevada Test Site for disposal
West Valley High-Level Waste

High-Level Waste Processing – BIG Success in Progress!

1996 – 2002  
Vitrification “Hot Ops”  
Processed 99.6% of sludge activity and 96.5% of Cs-137 activity  
Avg. canister fill height < than 90%  
Avg. contact dose rate ~2600 R/hr  
< than 23M curies processed

2007 – 08  
Conversion of Vitrification Facility into remote-handled waste processing area

275 HLW Canisters in Safe Storage in Main Plant Process Building
Future Successes

HLW Tank & Vault Drying

- Contractor tasked with isolating HLW Tanks and placing the Waste Tank Farm in a condition that allows safe and economical surveillance and maintenance
  - Remove residual liquids
  - Reduce or eliminate generation of new radioactive effluents
  - Eliminate and control future corrosion of the tanks

Challenges

- NEPA – Need phased approach to decommissioning
- RCRA – Tanks are regulated units
Alternate Canister Storage. Various commercially available dry storage systems exist with potential applicability for the passive dry storage of WVDP HLW canisters in configurations compatible with eventual transportation and disposal.

- Passive storage system
- Transportation, Aging and Disposal Canister System concept potentially applicable
- Existing commercial designs adaptable for WVDP HLW canisters
- One step closer to off-site disposal

New storage facility similar to GWSB#2 at Savannah River Site could also provide interim storage at WVDP

Future Successes

Environmental Management

www.em.doe.gov
DRAFT_19507_6
Interim End State

Permeable Reactive Barrier

Permeable Treatment Wall

NDA Cap and Barrier Wall

HLW Tank and Vault Drying System
Phase 1 Implemented

Lagoons Removed

Main Plant Removed

HLW Canisters in Shipping-Ready Storage