West Valley Demonstration Project

Waste Incidental to Reprocessing
Draft Evaluation for WVDP Melter

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NWTRB Meeting in Buffalo, NY
April 27, 2011
Waste Incidental to Reprocessing Process

**Criteria** in DOE Manual 435.1-1, Radioactive Waste Management:

- Removed key radionuclides to the maximum extent that is technically and economically practical
- Managed to meet safety requirements comparable to performance objectives of 10 CFR 61, Subpart C
- Meets Class C concentration limits and will be managed as LLW

**Process** consists of

- **Technical Evaluation**
  - Documentation of technical analyses against three criteria
  - NRC consultation
  - State and public comment process

- **Determination**
  - Determination occurs after consideration of results from evaluation
Vitrification Melter

Used to solidify 600,000 gallons of liquid radioactive waste into glass by vitrification process (1996–2002) per the WVDP Act.

During . . .

Electrodes removed, melter removed from Vitrification Cell, packaged and placed on hardstand – ready for shipment.

After . . .
Vitrification Melter (cont)

Unpackaged Melter
- 10' x 10' x 10'
- Inconel shell filled with refractory brick with stainless steel cooling jacket
- Flushed with chemicals and glass formers before shut down
  - Two evacuated canisters used to remove glass before shut down

Packaged Melter
- 14' x 13' x 13' carbon steel box (IP-2 container)
- ~159 tons packaged
- ~4,570 curies, primarily Cs-137
- Max contact dose rate calculated at 30 mR/hr on contact
- 6 mR/hr at 2 meters
- Stored on site with two other vitrification vessels
Packaged Melter Movement

Removing packaged melter from the Load-Out Facility in 2004 as part of Vitrification Facility dismantlement

Melter transported on a 12-axle trailer to south plateau for staging while awaiting shipment
Criterion 1: Remove key radionuclides to maximum extent technically and economically practical (10 CFR 61.55, tables 1 and 2)

- **Technically practical options**
  - Additional flushing
  - Evacuated Canister System
  - Dismantlement

- **Economically practical options**
  - Additional flushing
  - Dismantlement

Assessment demonstrated that further efforts to remove key radionuclides would have increased worker radiation dose without resulting benefits.
Demonstrating Criterion 2

Criterion 2: Meet safety requirements comparable to 10 CFR 61, Subpart C, Performance Objectives for Land Disposal Facilities

- Melter waste package will meet waste acceptance criteria for
  - Nevada National Security Site (NNSS)
  - Waste Control Specialists (WCS) Low-Level Waste Disposal Area in Texas

Waste Acceptance Criteria for these disposal facilities are comparable to performance objectives of 10 CFR 61, Subpart C
Demonstrating Criterion 3

- Criterion 3: Meets LLW concentration limits and managed in accordance with DOE requirements
  - Radioactivity in Melter waste package will not exceed Class C concentration limits
  - Melter waste package will be in solid physical form and grouted for stability
  - Melter waste package will be managed and disposed at offsite low-level radioactive waste disposal facility in accordance with applicable requirements for low-level waste
WIR Process Timeline

- Draft WIR Evaluation issued March 14, 2011, to facilitate consultation with NRC and State and public review and comment

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<tr>
<th>March 14</th>
<th>April 28</th>
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| ▪ Federal Register Notice  
  ▪ 45-day review period begins | ▪ 45-day review period ends | ▪ Comment resolution complete | ▪ Final DOE decision |

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- Comments submitted by April 28
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