THE 10TH ANNIVERSARY
RADWASTE SUMMIT

Progress in High-Level Waste Storage at the West Valley Demonstration Project

#RadWaste16

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Presented by Scott Anderson, Deputy General Manager
September 9, 2016
#CHBWV Safety Performance

<table>
<thead>
<tr>
<th>Metric</th>
<th>12-Month Rolling Average</th>
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<tbody>
<tr>
<td>TRC (12-Month Rolling Average)</td>
<td>0.35</td>
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<tr>
<td>DART (12-Month Rolling Average)</td>
<td>0.35</td>
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<tr>
<td>Last Lost-Time Case Recordable</td>
<td>November 5, 2012</td>
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<tr>
<td>More than 2M Safe Work Hours (1,375+ days)</td>
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West Valley Demonstration Project (WVDP) Site Background

- Site of the only commercial nuclear fuel reprocessing facility to operate in the U.S.
- Operated from 1966 to 1972
  - Reprocessed 640 metric tons of irradiated nuclear fuel
  - ~600,000 gallons of HLW liquid

- ~3,335 acre site owned by New York State
  - ~200 acre developed area managed by U.S. Dept. of Energy
  - Located 35 miles south of Buffalo

WVDP Site, Circa 1982
The West Valley Demonstration Project Act was signed into law on October 1, 1980. It directed the U.S. Department of Energy to:

- Solidify the high-level radioactive waste at the Western New York Nuclear Service Center - **Complete**
- Develop containers suitable for permanent disposal of the waste - **Complete**
- Transport the solidified waste to a federal repository for permanent disposal – **On Hold**
- Dispose of low-level radioactive waste and transuranic waste – **In progress**
- Decontaminate and decommission the underground high-level waste tanks, facilities and any material and hardware used in connection with the Project – **In progress**
WVDP Partners

CH2MILL • B&W West Valley, LLC
West Valley Demonstration Project
1982
~ 600,000 gallons of liquid HLW in storage at WVDP

1988 – 1995
Waste pre-treated and solidified in ~20,000 drums of cemented LLW

1996 – 2002
Remaining HLW sludge vitrified on site and placed in Main Plant Process Building (MPPB) storage pending off-site shipment

Present
HLW being relocated to prepare facility for demolition

Vitrified HLW
- 650 tons of borosilicate glass; ~24 million curies
- Canister dose rates between 1,100 and 7,460 R/hr on contact
- Original plan was to ship one canister per shipping cask
HLW Storage Cask System

- Passive system based on SNF Dry Cask storage
  - Stainless steel overpack with 5 canister array
  - Robust concrete storage cask
  - Engineered storage pad
Plan resulted in:

- Engineered redesign of processes and pathways
- Fleet of specialized equipment
- Storage Pad construction
Storage Pad Construction

- 3-feet thick reinforced concrete
  - Pad placed in 5 sections
  - 300 concrete deliveries

Pad Area Excavation

HLW Cask Storage Pad Concrete Placement

Completed Pad and Approach Apron
Subsurface Soil Instability

- Unique engineering challenges
  - Voids below facility floor
  - Soil instability beneath floor
Haul Path Upgrades

Haul Path evaluated for:

- Empty casks transport from parking lot to Load-in Facility
- 87.5 ton loaded casks transported ~2,600 ft. to storage pad

Steel Plating Installed Over Haul Path Culverts

Overhead Obstructions Removed  Parking Lot Evaluated and Repaired  ~1,600 Feet of Site Roadways Widened and Paved
Specialized Cask Handling Equipment

- Low Profile Rail Cart for Rail Area Movements
- Vertical Cask Transporter for Outdoor Movements
- TL220 Used in Load-In Facility (LIF) and EDR
- Air Pallets for Precision Movements in LIF
- EDR North
Specialized Equipment

- Removable contamination on canister lids and shoulders
- Automated welder to secure overpack lids
The Final Details

- Integrated dry-run testing
  - Full-scale operations
  - Operator proficiency verified
  - Process improvements identified
- 3M-2 shield door failure
  - Startup impacted by equipment failure in aging facility
November 2015 Startup

- 5-day Work Evolution
  - Day 1 – Cask Preparations
  - Day 2 – Canister Loading
  - Day 3 – Lid Placement
  - Day 4 – Welding
  - Day 5 – Relocation to Pad

- Four casks loaded and relocated in 2015
Current Status and Look Ahead

• Resumed VSC fabrication in April 2016
  – 44 of 56 complete
• Resumed VSC loading and transfer in May 2016
  – 24 of 56 complete
• Implementing accelerated plan to complete transfers by December 2016
  ... one year ahead of schedule!