West Valley Demonstration Project

1980 – 2011

Bryan Bower, DOE Project Director
WVDP Act

- Solidify the high-level radioactive waste at the Center [Completed]
- Develop containers suitable for permanent disposal of the waste [Completed]
- Transport the solidified waste to a federal repository for permanent disposal [Pending Repository]
- 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]
Spent Nuclear Fuel Shipping

1980s

625 SNF assemblies shipped by truck in the 1980s

125 SNF assemblies shipped by rail to Idaho in 2003
HLW Processing 1996-2002

- 24M curies vitrified
- 275 HLW filled canisters produced
  - Average contact dose rate 3,100 R/hr
  - Canisters stored in the Main Plant awaiting final disposition
- Operated 1996-2002
- Residuals remain in tanks (~348,000 curies)
Transition from Vit Ops to D&D

• Assembled team of experienced D&D personnel from different sites
  – High radiation D&D experience
  – Waste management expertise
  – Contact and remote handled TRU packaging and disposition

• Developed a comprehensive plan, schedule and cost estimate
  – Low cost disposition of LLW a key element
  – Focus on Risk Management
  – Innovative use of off-the-shelf hardware

• Transition from operations to D&D required time for planning, purchasing D&D equipment, training, and getting regulatory approvals
  – Workforce restructuring
  – Project Management tools utilized extensively

• D&D of Vit Facility starts after successful Readiness Review
Main Plant Process Building

- Only commercial spent fuel reprocessing facility to operate in the U.S.
  - Five-story reinforced concrete structure
  - 280,000 ft²; 28,000 square feet stainless steel-lined
  - Over 70 contaminated rooms/areas
  - Dose rate in 10% exceed 1 R/hr
  - Two rooms have doses over 50 R/hr
  - Over 115,000' of process piping systems, one-third of which transferred reprocessing solutions
Main Plant Decontamination

2007-2011

• Decontamination Completed
  – Upper Warm Aisle pump niche
  – Hot Acid Cell
  – Acid Recovery Cell
  – Extraction Cell-3

Acid Recovery Cell

Top-down view of empty XC-3

Hot Acid Cell vessel removal
Main Plant Decontamination

• Extraction Cell-1
  – First of three Extraction Cells
  – Highly radioactive, all work performed remotely

Above: Arm being installed in cell
Left: Arm cutting pipe in cell
Main Plant Decontamination 2007-2011

- Using Nitrocision® technology to remotely decontaminate cell walls and floors of Process Mechanical Cell (PMC) and the General Purpose Cell (GPC)
- Nitrocision® technology
  - Spray nozzles deliver -250°F liquefied nitrogen at ~50K psi to remove paint and contamination from cell surfaces
  - Vacuum collection
  - Met aggressive performance testing criteria

Nitrocision® at work in the PMC
Main Plant Deactivation

• Asbestos removal activities are ongoing in multiple areas of the Main Plant to prepare facility for demolition
  – Removal of asbestos conducted under strict OSHA guidelines
Radioactive Waste Processing 2007-2011

- Addressing remote processing challenges with additional equipment and adjustments in processing
- Contact Size Reduction Facility operational
  - Primary size reduction of equipment and debris before materials are packaged in Waste Packaging Area

Using plasma cutting to process the first plutonium contaminated TRU waste box in the CSRF
Waste Tank Management 2007-2011

- System installed to dry the underground waste tanks and their associated vaults

Removal of 16" underground vent pipe header

Workers monitor removal of a pump from Tank 8D-4
Groundwater Plume

2007-2011

- Installed Permeable Treatment Wall to mitigate migration of Sr-90 contaminated groundwater

“One-pass trencher”

Bags of Zeolite
West Valley Demonstration Project

Questions?