Overview of Supplemental LAW Cost Estimates and Analyses

David Swanberg
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Outline

This session will cover:

- Overview of historical cost evaluations of the Hanford tank waste treatment mission
- Basis for 2011 Supplemental LAW Immobilization cost comparison

Previous Studies

Previous cost analyses/comparisons

- Tank Waste Technical Options Report – Appendix R (1993)
- Assessment of Low Activity Waste Treatment and Disposal Scenarios for the River Protection Project (2003)
- Supplemental Treatment Technology – Life Cycle Cost Estimate (2003 Presentation)
- Supplemental Technologies Cost Summary Report (2003)
- External Technical Review of System Planning for Low Activity Waste Treatment at Hanford (2008)
- Cost Report for Tank Closure and Waste Management Environmental Impact Statement Alternatives (2009)
- RPP-RPT-47908 (Draft), Supplemental Treatment Project - Immobilization System Pre-Conceptual Candidate Technology Cost Estimates (2011)

General Observations

- Previous cost analyses/comparisons were based on preliminary data/information
  - Early estimates were based on limited experience with actual design, construction, and operation of DOE waste treatment facilities
- Estimates are outdated
  - Estimates for supplemental LAW alternatives typically trace back to 2003 estimates for Mission Acceleration Initiative
- Cost deltas are masked when rolled up to total mission Life Cycle Costs
  - Realistic deltas of several $B go unnoticed

2011 Cost Analysis

- Cost analysis prepared for Supplemental Treatment Project in 2011 indicated Low Temperature Immobilization had lowest cost*
  - Prepared Class 4 estimates per Association for the Advancement of Cost Engineering (AACE) Recommended Practice 18R-97 definitions
  - Costs included Capital and Operating costs for an assumed Supplemental LAW treatment mission
  - Low Temperature Immobilization cost was ~8X lower than supplemental LAW vitrification

*RPP-RPT-47908, Rev. 0 (Draft), Supplemental Treatment Project Immobilization System Preconceptual Candidate Technology Cost Estimates, September 2011 (OUO)

2nd LAW Vitrification Cost Basis

- Source Documents
  - Independent Validation Review of the May 2006 Estimate at Completion for the Hanford Waste Treatment and Immobilization Plant Project (USACE 2006)
  - DOE/ORP-2007-03, Hanford River Protection Project Low Activity Waste Treatment: A Business Case Evaluation
  - Second LAW Vitrification cost estimating input sheet, work breakdown structure WBS 5.04.01.08.01 (Baseline, DOE/ORP-2007-003)
  - Construction costs include additional equipment identified in RPP-RPT-48333. Equipment sizing based on 24590-WTP-RPT-PT-02-005, Flowsheet Basis Assumptions and Requirements

Other Technologies

- Steam Reforming
  - Technical Description and ROM Cost Estimate for a FBSR Facility to Treat Hanford LAW, Supplemental Treatment Project (THOR 2009).
- Bulk Vitrifcation
  - Letter 08RL0539, Transmittal of Updated DBVS Life-Cycle Cost Estimate (Fritz, 2008)
  - RPP-16215, Production Bulk Vitrification System Pre-Conceptual Engineering Report (2003)
  - RPP-25462, Rev. 1, Demonstration Bulk Vitrification System Balance of Design Review Package (2008)
- Cast Stone
  - RPP-RPT-26689, Hanford Containerized Cast Stone Project 100 Percent Pre-conceptual Design Document (2003)

Changes

- 2011 Analysis included significant scope changes since the four previous analyses were developed
  - 2nd LAW Vitrification was expanded by increasing the number of melter lines from three to six
  - Steam Reforming facility was expanded by increasing the number of 72-in. diameter steam reformers from two to four
  - Bulk Vitrification facility essentially doubled in capacity by increasing the number of processing lines from three to six
  - Cast Stone facility was expanded by adding a process line, increasing the number from two to three

Summary

- The 2011 Cost Analysis/Comparison was based largely on prior estimates with adjustments for changes in throughput to meet mission duration targets
- Costs were escalated to present day costs for side-by side comparisons
- Review of prior cost estimates for treatment of Hanford tank waste indicate wide range of variability and uncertainty
- The magnitude of the decision to be made warrants a thorough and defensible cost analysis