33rd Waste Management Symposium 2007

An Independent Review of the DBVS Process

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EM Environmental Management
safety ❖ performance ❖ cleanup ❖ closure

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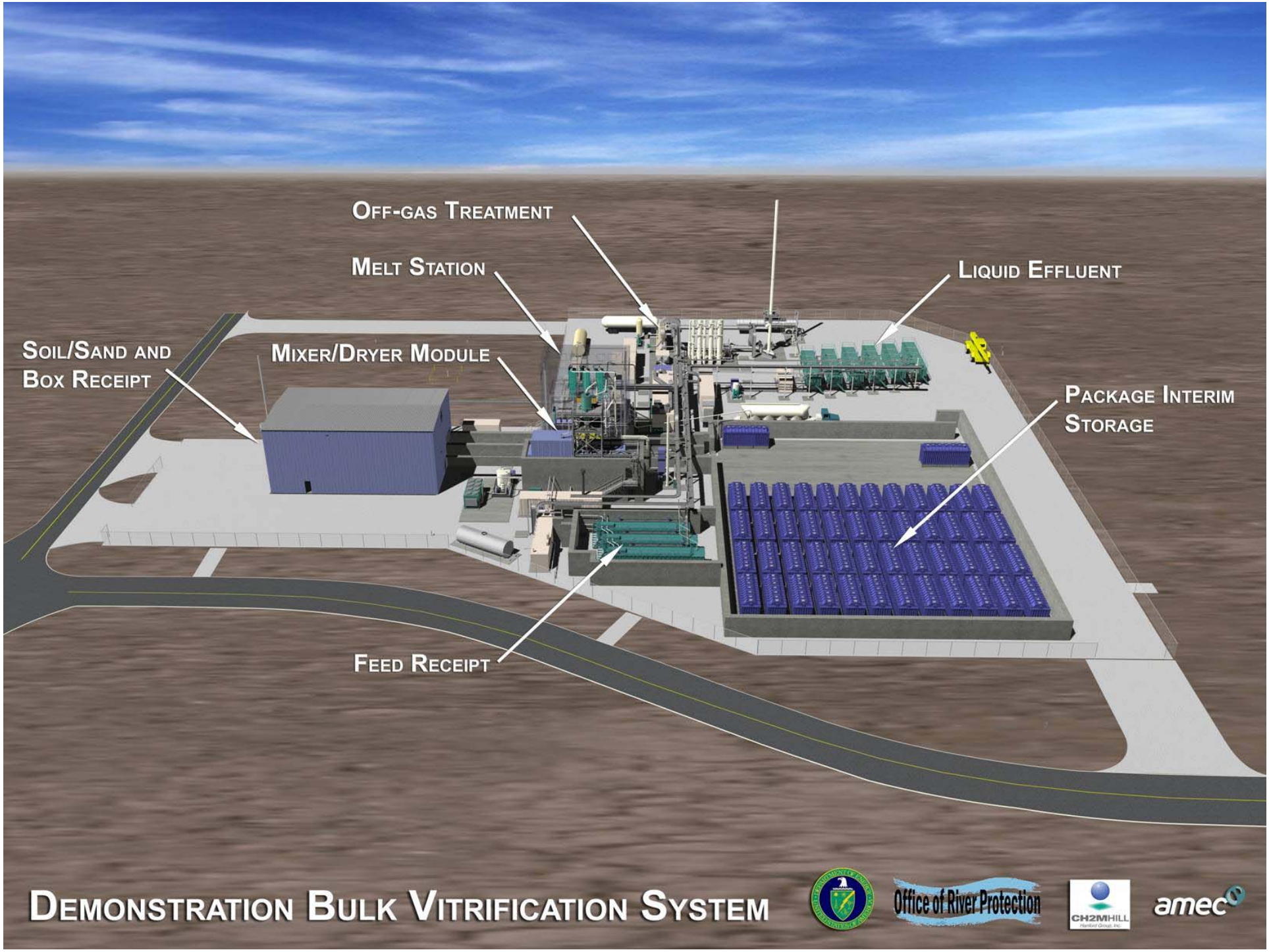
DBVS Mission Need

- Process approximately 190,000 gallons of Tank S-109 waste into fifty 100 metric ton boxes of vitrified product
- Store and dispose of boxes at Hanford's IDF
- Evaluate the waste form characteristics
- Develop the overall life cycle system performance of Bulk Vitrification and produce a comparison of the Bulk Vitrification process to building a second LAW Immobilization facility or other supplemental treatment alternatives.
- Gather pilot plant operability data


Off-gas Treatment
Melt Station
Liquid Effluent
Soil/Sand and Box Receipt
Mixer/Dryer Module
Package Interim Storage
Feed Receipt
Demonstration Bulk Vitrification System
Office of River Protection
CH2MHILL
amec

Expert Review Panel Approach

- Evaluated if the DBVS system, as designed:
  - Will meet the requirements defined in the Justification of Mission Need and the System Specification,
  - Will produce a waste product that meets Integrated Disposal Facility (IDF) disposal requirements, and
  - Will meet DOE Authorization Basis and safety management requirements
- Review did not compare DBVS to other technologies nor review project cost and schedule

Hierarchy of Issues

- Fatal Flaws
  - Issue will cause failure of the DBVS, and cannot be resolved.
- Technical Issue
  - Issue will result in a failure of the DBVS demonstration system to meet established DBVS system performance requirements unless addressed prior to start of hot operations of the DBVS facility.
- Area of Concern
  - Issue may result in a change to design, or may require additional testing to determine if the design is adequate (now or later)
- Suggested Improvements
  - Actions which the project should consider to improve safety, cost, schedule, or efficiency during the test operations.

Lessons Learned

- Begin an external review process early enough to impact the project
- Tailor the review to match the stage of the project design/construction
  - Technology basis and flow sheet design prior to start of preliminary design
  - Preliminary Design Completion prior to start of detailed design
  - Review of preliminary safety analysis
  - Complete Detailed Design prior to the start of construction
  - Planning for cold and hot commissioning
  - Review results of design, construction, cold commissioning prior to hot startup

Lessons Learned (cont.)

- Seek the most capable review team members available
- Allow an adequate time frame to conduct the review
- The effort should be chartered by the senior management of the sponsoring organization
- The sponsoring organization should assign senior executive to manage the review
- Bin the issues carefully-avoid overlap.

Lessons Learned (cont.)

- Develop detailed charter for review – get it approved by all parties prior to review
- Spend time organizing the technical and design information prior to review team starting
- Establish working and meeting schedules early that respect the project team's work load. Develop work-arounds for when inevitable schedule conflicts develop with review team or project team.
- Prepare concise report that answers the questions posed in the charter simply and directly.
- State the context of the findings.

The Context for our findings

- Project transition from simply making radioactive glass to a 413.3 project providing data to meet a series of mission objectives
- The experimental program has focused on vitrification and not the balance of plant
- While testing to date has produced good glass, each test has resulted in a major surprise.
- Resolution of issues from this review will lead to a viable process for vitrification of low activity waste