

Melton Valley Storage Tank LLW Vaults - Shipment of Entire Concrete Storage Vault as an Approved IP-2 Package

A Success Story

By the

Nuclear Science and Technology Division
Transportation Technologies Group

Shipping of LLW from SWSA 6 to NTS - Costly and With Significant Radiation Exposure to Personnel



Unshielded
21,000 lb
LLW Monolith



~200 Vaults with LLW
At SWSA 6

Placement of Monolith
in Rented Shielded
Cask (Expensive)

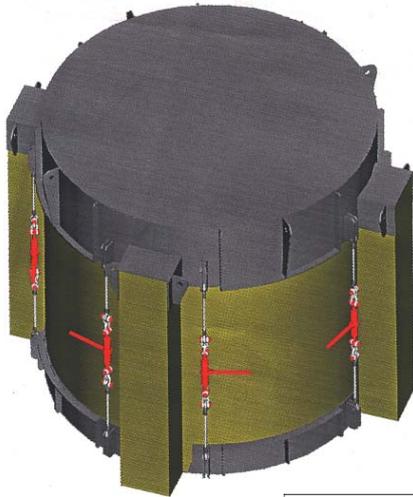
Removal of Grouted LLW from
Concrete Vaults at MVST

Solution – Design and Certify MVST Concrete Vault as IP-2 Package

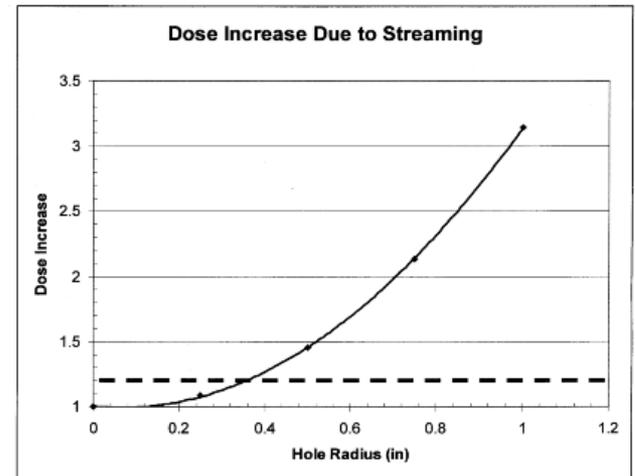
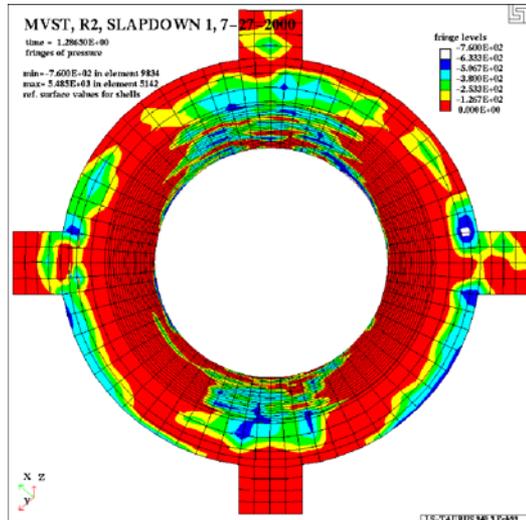
- Reduce personnel exposure – no need to open and remove LLW monoliths at ORNL and unload casks at NTS.
- Total programmatic savings estimated at about \$2M – reduced shipments and cask rental savings.
- Additional savings by avoiding later shipments of empty vaults to NTS for disposal.

MVST Lid Retention Device

structural design and dynamic response (before test)
and shielding analysis (post-test)



LS-DYNA 3D
(Structural
Analysis
And Dynamic
Response)



SCALE SAS4 MORSE
(3-D Monte Carlo Shielding)

Phase 1 – IP-2 Package Design, Testing and Approval



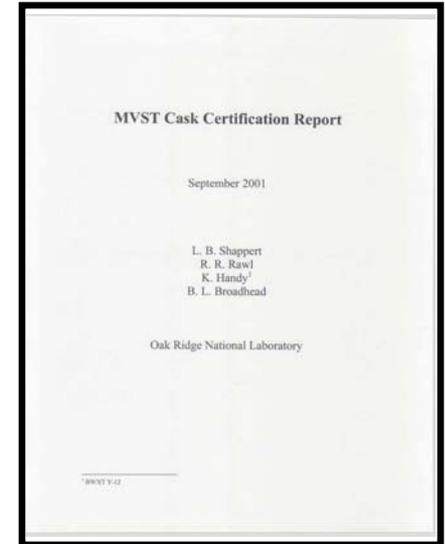
Design a “Lid Retention Device”



Test to IP-2 criteria



Evaluate damage



Prepare design
certification
document

DOE/ORO
Approval in
September 2001

Phase 2 – Tiedown System Design, Readiness Review, and Handling Procedures



Trailer Chocks



Tiedowns for Vault



Tiedowns to return reusable components to ORNL

Plus – ORNL conducted readiness review and Developed loading/unloading procedures for Use at both ORNL and NTS