

Radioassay/Non-Destructive Testing Facility Los Alamos National Laboratory



Seismic Upgrades Status Update



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RANT Safety Basis - Outline



- Background
- Current condition of Radioassay and Nondestructive Test Facility (RANT)
- Options for moving forward



Shipping – RANT Facility



RANT Facility

- TRUPact II loading capability
- Redundant cranes for reliability
- TRUPact III loading capability can be added
- Facility operations paused due to seismic vulnerability with the RANT Building. RANT remains in COLD STANDBY pending seismic upgrade.
- Mobile loading outside the RANT Building on the RANT Site is allowed in the RANT Safety Basis



RANT Facility, TA-54



Background



- DNFSB issued letter to Administrator Klotz that identified issues related to the RANT Safety Basis – December 9, 2014
- LANS declares a PISA based on information brought forward indicating incorrect assumptions for the BIO/DSA from the seismic analysis – December 17, 2014
 - Although the facility is credited to withstand a PC-2 event, the existing analysis shows that it will not survive a PC-1 event.
 - Annual Probability of Unacceptable Performance for the RANT structure is in the range of 9.6x10⁻⁴ to 1.3x10⁻³
 - o BIO assumed range was acceptable for an existing PC2 structure with a performance goal of 1x10⁻³
 - DOE STD 1020 allows for evaluation of existing SSCs at twice the <u>hazard frequency</u>.
 - Calculations show that evaluation of loads to the RANT structure at twice the hazard frequency exceed structure capacity.
- NA-LA rescinded the SER which approved the 2013 RANT DSA and TSRs on December 19, 2014



RANT Current Condition



- Facility in COLD STANDBY (No nuclear material in the facility)
- Current Safety Basis is 2012 BIO and TSRs, adequate for operations under COLD STANDBY
- RANT ESS-15-001-R0 PISA Incorrect Assumption for RANT BIO Seismic Analysis
 - Operational Restriction put RANT in Cold Standby.
- RANT has been Identified as an Enduring Facility, but no Immediate Need for Shipments
 - o No need to execute shipments until WIPP re-opens.
 - Emergent shipping needs can be met with Mobile Loader at TA-55



Path Forward



Current:

- Seismic upgrades add drilled piers, shear walls, and reinforce roof structure
 - Design for seismic upgrade completed in 2006 is being updated to current codes and seismic hazard.
 - Current point cost estimate for work is slightly less than a line item estimate
 - Cost estimate will be finalized with 100% design (estimated March 2017)
 - Construction duration (award to closeout) less than 1 year
 - Determined not to be a Major Modification under safety basis requirements
 - Design has been funded to completion in FY17.
 - Funding for construction is dependent upon if the estimate remains in the range of GPP or increases to Line Item (LI)
- Revise DSA to DOE-STD-3009-2014 to incorporate facility modifications



RANT 2006 Seismic Upgrade Design Status



Loads have increased significantly:

- Ground acceleration motion has increased by 50%.
- Code required redundancy factors have resulted in an additional increase of 40%

Load changes have impacted all elements of the design:

- Sizes and reinforcement of concrete collector elements at the perimeter of the roof relatively minor.
- Size and reinforcement of the concrete shear walls and grade beams significant impact but not much can be done to minimize.
- Change to structural upgrade of roof from concrete reinforcement to a Carbon Fiber Reinforced Polymer
- Size and number of concrete piers that are the foundation of the upgrade significant impact.
 Geotechnical firm has been engaged to drill boreholes and collect samples to solidify pier design inputs
 - Field work completed in December 2016
 - Preliminary data & report expected in February 2017
 - Final report expected in March 2017



RANT 2006 Seismic Upgrade Design Status



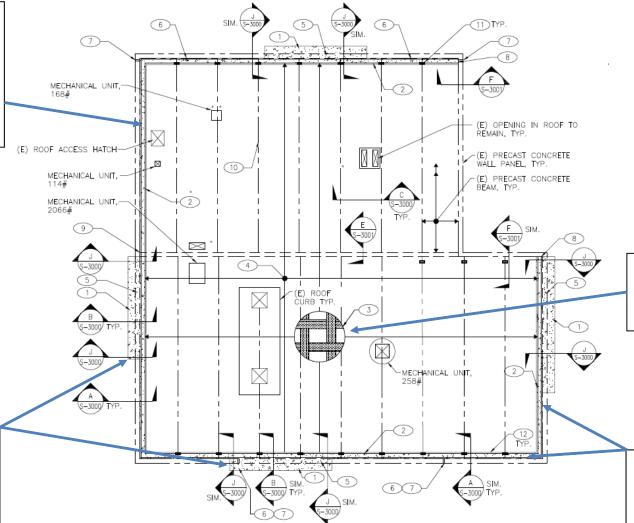
- The diaphragm design has changed to take advantage of our knowledge gained with Carbon Fiber Reinforced Polymer (CFRP) use at PF4.
 - CFRP has replaced the light weight concrete diaphragm that the 2006 design used
 - CFRP is much lighter in weight and provides the needed strength required to resist the increased seismic load.
- 90% design is to be released in March but dependent on geotechnical findings and recommendations.



RANT Seismic Upgrade – Roof Plan



Reinforced concrete collector ~ Typical at perimeter of the roof



Carbon Fiber Reinforced Polymer overlay on roof

Reinforced concrete shear wall ~ Typical on four sides

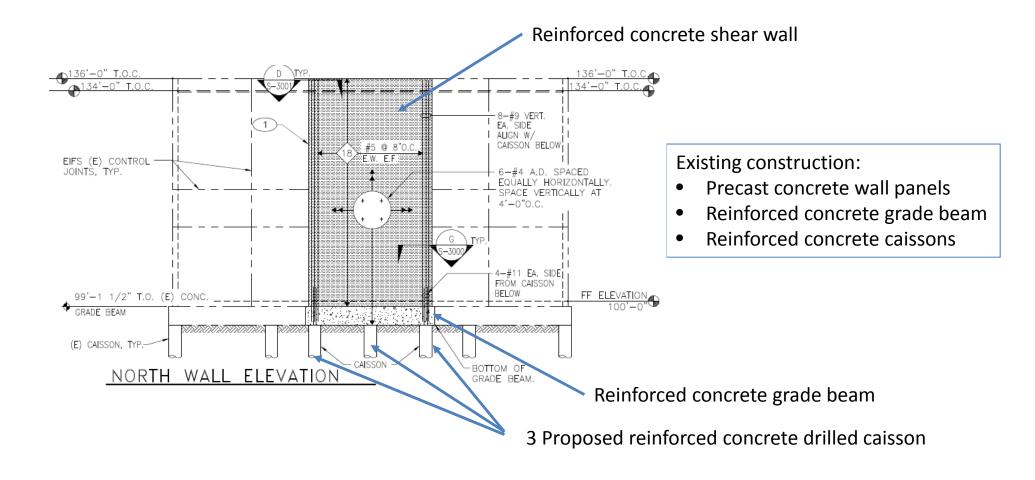
Reinforced concrete collector ~ Typical at perimeter of the roof

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RANT Seismic Upgrade – Typical Wall Elevation







Summary Slide



Design is progressing, nearing completion

- Next key dates
 - Completion of Geo Tech evaluation
 - Preliminary evaluation expected within a week
 - Final report expected end of March
 - Finalize foundation design end of March
 - Cost estimate finalization following Geo Tech estimate
 - Execution strategy decision
- Next update proposed May 2017