



Radioassay/Non-Destructive Testing Facility Los Alamos National Laboratory



Seismic Upgrades Status Update



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UNCLASSIFIED



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 9.6×10^{-4} to 1.3×10^{-3}
 - BIO assumed range was acceptable for an existing PC2 structure with a performance goal of 1×10^{-3}
 - DOE STD 1020 allows for evaluation of existing SSCs at twice the hazard frequency.
 - 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- **NA-LA rescinded the SER which approved the 2013 RANT DSA and TSRs on December 19, 2014**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**
 - 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



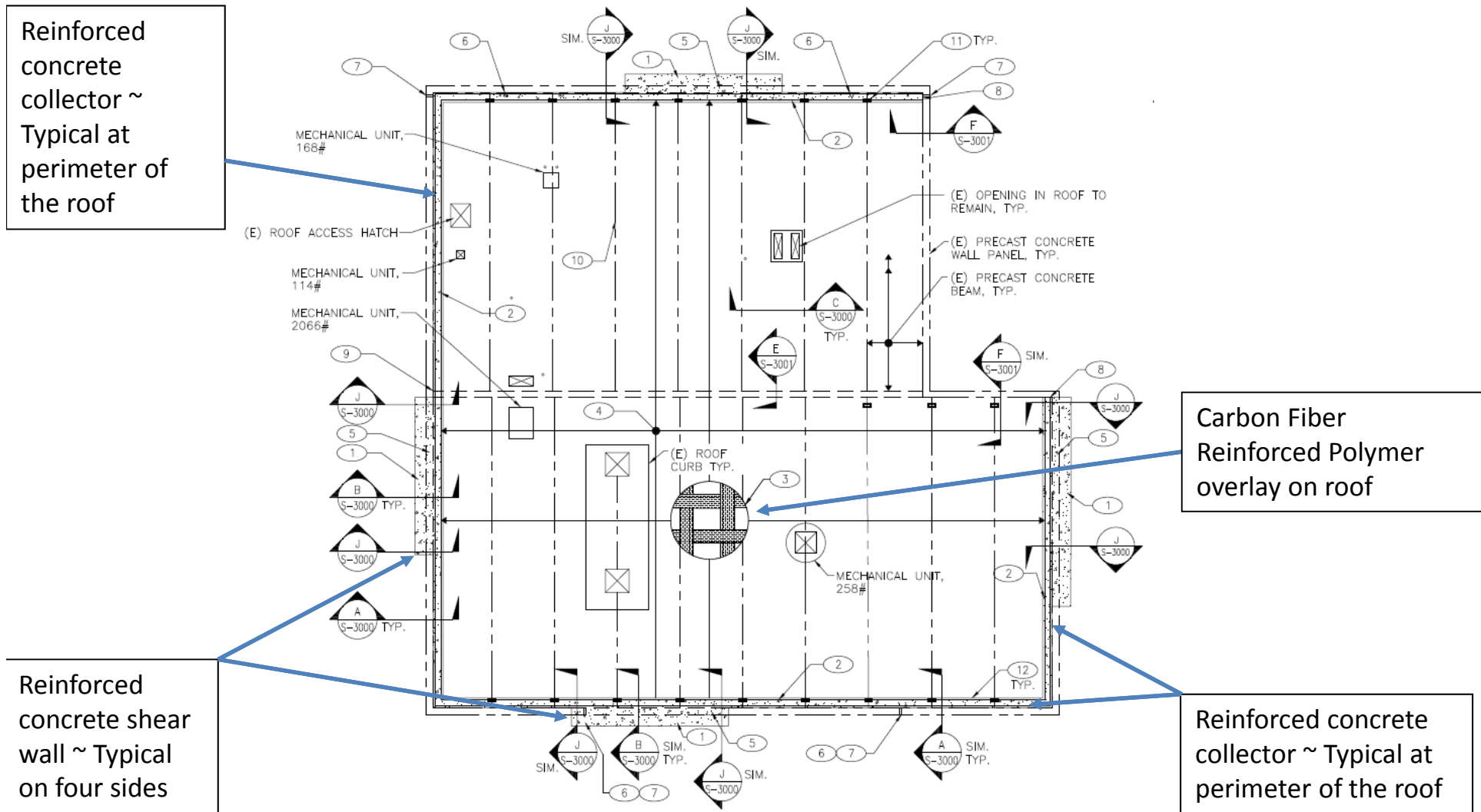
RANT 2006 Seismic Upgrade Design Status



- **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.**



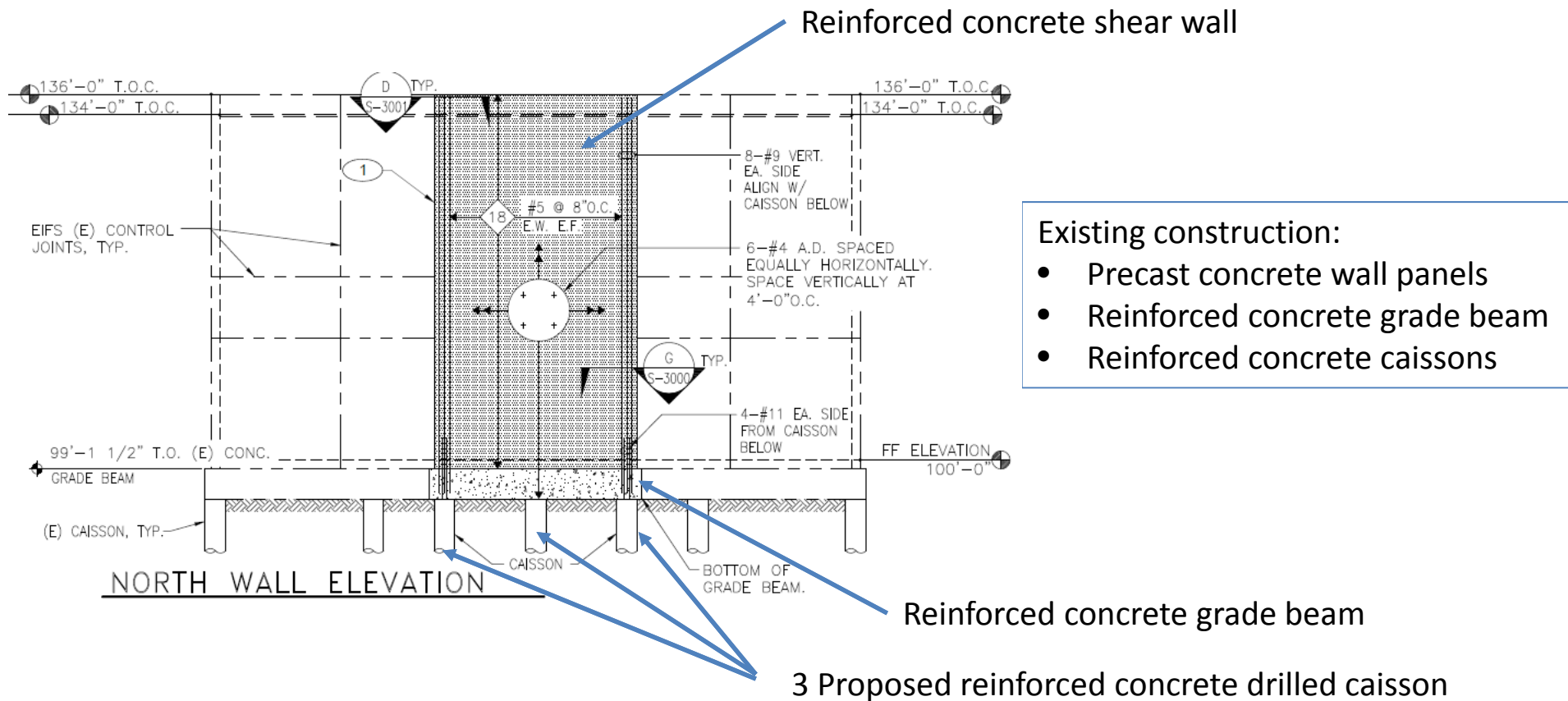
RANT Seismic Upgrade – Roof Plan



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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**