

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 28, 2007

**MEMORANDUM FOR:** J. Kent Fortenberry, Technical Director  
**FROM:** B. Broderick and C. H. Keilers, Jr.  
**SUBJECT:** Los Alamos Report for Week Ending September 28, 2007

Broderick was at DNFSB-headquarters in Washington D.C. this week.

**Plutonium Facility (TA-55):** LANL has met its milestone of fabricating 10 QA-accepted pits in FY-07.

**Criticality Safety:** LANL has analyzed the "as-is" condition and credible upsets in the four TA-55 vault rooms in question and has concluded that adequate margin-of-safety exists; LANL has also determined that mass or density limits need to be reduced, in at least two rooms, or an engineered solution needs to be implemented to assure can spacing. Vault fissile material moves remain secured.

This week, after reviewing criticality safety implications, TA-55 resumed a limited number of fissile material operations that improve the facility's safety posture going into the 7-week planned outage, scheduled to begin Nov 5<sup>th</sup>; examples include processing solutions, terminating furnace runs, emptying furnaces, and removing small analytical specimens. LANL is piloting a screening and resumption review/approval process for the remaining operations. Both NNSA criticality safety personnel and the recently re-established LANL criticality safety committee are conducting oversight.

**Site-wide Emergency Exercise:** LANL ran its annual exercise on Wednesday; it involved a simulated Pu-238 lab-room explosion in TA-55, facility evacuation, and fire department response. Some artificiality was necessary: before this exercise, lab-room personnel placed work in a safe condition, monitored, and exited to the corridors; fire-fighters and their 2 vehicles were pre-screened by security.

Some emergency capabilities were well-demonstrated (e.g., evacuation). However, two key elements were not well-demonstrated and may need attention. Specifically, these are LANL and the fire department's capabilities to (1) manage resources and address a radiological accident of this scale at TA-55, and (2) provide timely and proper response to contaminated, severely injured personnel. For example, in this exercise, the TA-55 facility incident command (FIC) was overly-crowded but needed more resources; as-is, the FIC appeared challenged. Also, the fire department response was overly-simulated, and the responders present were underutilized. The response for 2 postulated severely injured and contaminated workers was initially simulated and appeared inadequate when it did occur.

**Transuranic Waste Operations:** This week, LANL completed a review on implementation of new safety basis controls at the RANT shipping facility that support shipping about two-hundred high-activity waste drums to WIPP. Comment resolution is underway (site rep weeklies 9/14/07, 6/22/07).

The concern at RANT has been the building's seismic capacity, which LANL now believes to be adequate for an 800 to 1,000 year return-period earthquake (i.e., PC-2, safety-significant). While the new controls permit a factor of 8 increase in radioactive inventory inside the building, the predicted unmitigated accident consequences have dropped an order of magnitude compared to prior analyses (i.e., to 63 rem for seismic-induced fire); this is due to use of the new TRU standard (DOE STD-5506). The safety-class engineered control is the containers; the specific administrative controls at the safety-class level include radioactive and combustible inventory limits, hot-work restrictions, fueled vehicle restrictions, and separation distance to exterior drum staging. Safety-significant controls include the structure, the fire suppression system, and nearby ground-slope (site rep weekly 7/28/06).