

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 19, 2003

**MEMORANDUM FOR:** J. Kent Fortenberry, Technical Director  
**FROM:** C. H. Keilers, Jr.  
**SUBJECT:** Los Alamos Report for Week Ending December 19, 2003

**Plutonium Facility (TA-55):** NNSA released this week the Type B investigation report on the 8/5/03 Pu-238 contamination event. The report identifies the direct cause as an airborne release from a degraded package containing cellulose material (i.e., cheesecloth) and Pu-238 residues. The root causes were (1) the LANL division failed to balance management attention and resources between accomplishing the programmatic mission and providing an appropriate level of protection for the workers handling Pu-238; (2) DOE, NNSA, and LANL failed to adequately evaluate and understand the magnitude of the worker safety risks that they have accepted for the activities conducted by the Pu-238 Group; (3) DOE, NNSA, and LANL managed DNFSB Recommendations 94-1/00-1 as projects for addressing legacy materials storage rather than as an effort to mitigate potential hazards to workers.

The failed package had been stored in the room since 1996, and was a can-bag-can configuration as previously described (site rep weekly 8/8/03). Chemical, radiolytic, and thermal decomposition of the contents and packaging caused the inner can and plastic bag to fail. Corrosion of the outer can appears to have caused the breathable seams to seal, allowing gas to build up. Simple handling of the package was sufficient to dislodge the corrosion and allow contamination to vent to the room. The failure mechanisms for all 3 "barriers" can occur simultaneously and independent of each other. The failure was similar to previous container failures that have been the subject of well-known reports since 1994.

The NNSA report states that the consequences could have been much greater and that it was nothing more than fortunate geometry and timing of the release that limited the consequences to exposed employees. Furthermore, there was no packaging configuration design; no analysis of contents and package material compatibility; no control on what could be placed in the package; no formal periodic package surveillance; no residue processing schedule; no limit on the quantity of Pu-238 that could be stored in the room; and no hazard control plan in place for the room or the activities conducted in the room. The identified issues are not limited to LANL but also include NNSA Site Office oversight of Pu-238 operations; DOE-NE and NNSA division of responsibilities for funding and oversight; and DOE, NNSA, and LANL management of 94-1 and 00-1 nuclear material stabilization. LANL has begun corrective actions for activities within its scope, such as the comprehensive inventory evaluation discussed last week. A corrective action plan is forthcoming.

**Weapons Engineering Tritium Facility (WETF):** LANL has completed a thorough readiness assessment (RA) for WETF on the full TSR implementation and on closure of open items for Building 450 startup (site rep weekly 8/1/03). The NNSA Operational Readiness Review is now expected in April 2004. The RA team complemented the facility on the TSR implementation effort but observed the need for improvements in configuration management, maintenance, and conduct of operations.

**Training:** Recently, LANL conducted an assessment of institutional training and identified issues that could impact nuclear facilities, such as not all lab organizations are effectively staffed and managed to facilitate a systematic training process that supports LANL missions; to the extent that training evaluations are done, they are not endorsed at the appropriate management level nor are results used to develop corrective action plans; and there is no policy governing worker disqualification following a training course failure. LANL is developing a corrective action plan. The NNSA Site Office has also begun an assessment of both institutional and facility-specific training.