DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 22, 2007

MEMORANDUM FOR: J. K. Fortenberry, Technical Director
FROM: M. J. Merritt, DNFSB Site Representative
SUBJECT: Lawrence Livermore National Laboratory (LLNL)
Report for Week Ending June 22, 2007

Plutonium Facility Annual Emergency Evacuation Exercise: LLNL is required to conduct a criticality accident response drill or exercise annually. This requirement is captured in American National Standards Institute/American Nuclear Society (ANSI/ANS) 8.23, *Nuclear Criticality Accident Emergency Planning and Response*, and is promulgated in LLNL's Work Smart Standards. The implementation of the standard at LLNL alternates between an exercise and a drill each year. On June 20, 2007, LLNL conducted an emergency exercise at the Plutonium Facility that involved a simulated criticality accident. The exercise included the other Superblock nuclear facilities in the evacuation. The requirements of ANSI/ANS 8.23 were satisfied by the exercise.

The specific scenario involved a simulated criticality event in a laboratory room and actual activation of the criticality alarm system. One of the fissile material handlers (FMHs) involved in the scenario simulated an injury that required emergency response assets for rescue. The remaining FMHs evacuated the radioactive material area (RMA) and were surveyed by hazards control technicians for radioactive contamination and activation of the nuclear accident dosimeters. The potentially contaminated FMHs were segregated from the non-RMA personnel and the evacuation and personnel accountability procedures were performed. Strengths of the exercise included the exercise planning and scenario development and the implementation of the evacuation and muster procedures. Some weaknesses were observed in communications between response organizations and the timeliness of rescuing the injured FMH.

Nuclear Material Packaging: On June 14, 2007, LLNL provided the Livermore Site Office (LSO) with a cost and schedule estimate to implement the draft DOE M 441.1-1, *Nuclear Material Packaging Manual*. Implementation of this manual at LLNL is intended to satisfy Board Recommendation 2005-1, *Nuclear Material Packaging*. Due to time constraints on the response date (see weekly report dated May 25, 2007), LLNL was not able to conduct a thorough evaluation of its stored nuclear material against the requirements of the manual. LLNL does claim to have a "relatively good understanding" of the requirements of the manual as it relates to the material stored at LLNL. According to LLNL, only one of the packaging configurations being considered was able to survive the drop test requirements – the DOE-STD-3013-compliant package. The Hagan can and the food pack can failed the drop test requirements. Based on the results of the drop tests, LLNL stated in its response that the cost to implement the packaging requirements would be approximately $57 million over 11 years. Additionally, LLNL was unable to provide a resource loaded schedule. In the view of the Site Representative, use of the DOE-STD-3013 packaging for programmatic material would not be practical or warranted. Therefore, additional evaluation of other packaging configurations (that will meet the drop test and leak check requirements) should be pursued and the current cost estimate should be discounted.

Radiography Facility Operations: Operations were performed in the Radiography Facility this week. The operation involved radiography of a plutonium pit. Procedural performance continues to improve.