

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 16, 2005

MEMORANDUM FOR: J. K. Fortenberry, Technical Director
FROM: Michael J. Merritt, DNFSB Site Representative
SUBJECT: Lawrence Livermore National Laboratory (LLNL)
Report for Week Ending December 16, 2005

Plutonium Facility Fire Protection Program: LLNL has completed a root cause analysis of the Plutonium Facility fire protection program deficiencies that led to a Technical Safety Requirement (TSR) violation being reported last July (ORPS report OAK-LLNL-LLNL-2005-0056). The deficiencies were primarily related to lack of compliance with testing and maintenance requirements defined by National Fire Protection Association (NFPA) standards. Since the TSR violation was declared, the NFPA requirements have been satisfied (see weekly reports dated August 12, 2005 and October 28, 2005). The root cause analysis was one of the commitments contained in the TSR recovery plan for the fire protection program (see weekly report dated August 26, 2005).

The root cause analysis was performed in accordance with the *LLNL Environment, Safety and Health (ES&H) Manual, Document 4.6, Incident Analysis Manual*. The root cause determination concluded that the overarching cause for the deficiencies was that there was no program in place to periodically assess the facility's implementation of NFPA 13 and 25 requirements. The final corrective action is to develop a comprehensive fire protection self-assessment program as identified in DOE Order 420.1 A, *Facility Safety*. The analysis also specified a number of causal factors. These include inadequacies in management systems and human performance, as well as, technical inconsistencies between the Safety Analysis Report and NFPA standards.

Highly Enriched Uranium (HEU) Processing: LLNL has submitted a request to the Livermore Site Office (LSO) to process excess plutonium-contaminated HEU so it can be shipped to the Savannah River Site (SRS) for disposition. The LLNL request states that the HEU must be processed to meet the SRS acceptance criteria and the Department of Transportation (DOT) shipping requirements. The processing would be performed in the Plutonium Facility as part of reduced activities (see weekly report dated December 9, 2005) and could be conducted under the existing 5 kilogram fuel-grade plutonium equivalent limits (see weekly report dated December 2, 2005). Using the equivalent mass multiplier for uranium specified in the Facility Safety Plan, 15,000 grams of uranium-235 is equivalent to less than one gram of 30 year old fuel-grade plutonium in terms of offsite dose consequence from postulated accident scenarios defined in the Safety Analysis Report.

LLNL currently has excess HEU stored in numerous containers. The inventory is approximately two-thirds metal requiring conversion to an oxide to meet the processing requirements for the SRS HB-Line. The LLNL processing would require the capabilities of work stations in multiple Plutonium Facility rooms using currently approved Operational Safety Plans (OSPs). The required work stations and associated OSPs have not yet entered into operational trial periods. The processing would consolidate the HEU into a smaller number of containers. LLNL proposes using DOT 6M shipping containers rather than DOT 9975 shipping containers. The DOT 6M option is substantially more cost-effective since it does not invoke the DOE-STD-3013 requirements for the inner container. According to the request, SRS must begin receiving LLNL's HEU in late fiscal-year 2006 in order to meet the HB-Line processing schedules.