

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 26, 2004

MEMORANDUM FOR: J. K. Fortenberry, Technical Director
FROM: Michael J. Merritt, DNFSB Site Representative
SUBJECT: Lawrence Livermore National Laboratory (LLNL)
Report for Week Ending November 26, 2004

Plutonium Facility Safety Systems: In late October 2004, two occurrence reports (ORPS reports OAK–LLNL–LLNL–2004–0050 & 0056) identified potential inadequacies in the safety analysis (PISA) for the Plutonium Facility. On November 18, 2004, LLNL completed its review of these issues using the unreviewed safety question (USQ) process in accordance with 10CFR830.203, *Nuclear Safety Management, Subpart B, Safety Basis Requirements, Unreviewed Safety Question Process*. Both reviews determined that positive USQs existed. A positive USQ determination indicates that the facility is outside its approved safety basis and approval of the Livermore Site Office (LSO) is required. On November 22, 2004, a positive USQ determination was also declared for a third condition (ORPS report OAK–LLNL–LLNL–2004–0040) that was originally identified in late August 2004. A brief description of each of the three issues is provided below:

USQ Number: B332-04-047-D: A potential inadequacy in the safety basis exists relative to the available water flow provided by the fire-suppression system to the Increment 3 Room Ventilation System high-efficiency particulate air (HEPA) filter deluge system. The actual amount of water available is less than the amount described in the LSO-approved Safety Analysis Report (SAR). If the flow was determined to be inadequate, the ability of the final stage HEPA filtration system to function during a room fire event may be compromised. However, the rate presently described in the SAR exceeds the requirements specified in DOE-STD-1066-99, *Fire Protection Design Criteria*.

USQ Number: B332-04-049-D: An inadequacy in the safety basis exists relative to the pressure blanket requirement for the Emergency Water Supply tanks. The pressure blanket requirement in the Plutonium Facility SAR is inconsistent with National Fire Protection Association (NFPA) 13, *Standards for the Installation of Sprinkler Systems*. NFPA 13 requires a pressure blanket of 75 psi, but the SAR and Technical Safety Requirements (TSR) only require a pressure blanket of 72 psig. Operating the at the lower pressure may increase the probability that the tanks fail to provide sufficient water to the Fire Detection and Suppression System in the event that domestic water sources fail. Despite this inconsistency, the actual tank pressures in the facility are normally maintained at 78 psig, although it is not required by the safety basis.

USQ Number: B332-04-046-D: During an engineering inspection, potential cracking was observed in the safety-significant portion of the glovebox exhaust system duct work in one laboratory room. The glovebox exhaust system protects workers and prevents radioactive release to the environment and the public. The system, in the room where potential cracking was observed, is constructed of stainless steel tubing with welded connections. The function of the system is to carry the glovebox exhaust to the final stages of building HEPA filters. Operations in the gloveboxes connected to this duct work were suspended until “cuffs” were installed at the three locations where potential cracking was observed and at another suspect location. The installation of the cuffs was completed without performing a USQ screening or determination. Subsequently, a determination concluded that this condition represents a positive USQ. The primary concern is the ability of the cuffed duct work to survive an Evaluation-Basis Earthquake.