

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 4, 2009

**MEMORANDUM FOR:** Timothy Dwyer, Technical Director  
**FROM:** Jonathan Plaue, DNFSB Site Representative  
**SUBJECT:** LLNL Activity Report for Week Ending December 4, 2009

**Tritium Facility:** On November 24, 2009, facility management determined that a potential inadequacy in the safety basis (PISA) existed relative to a discrepant as-found condition for storage of three plastic bottles containing legacy tritium-contaminated oil. The PISA originally stated that the oil was found to contain tritium in excess of 600 Ci and therefore must either be processed inside a safety significant glovebox or stored in a robust container. The specifications for a robust container for this material have not been established. After further study of the safety basis, the PISA was revised and the occurrence report updated on December 2, 2009 (these updates are typically not distributed to DOE Headquarters). The update instead reflects the fact that the legacy oils were found to contain accountable quantities of tritium and that the safety basis may not evaluate storage for accountable amounts of tritiated oils. The oils, which are located in a fume hood and triply contained, were judged by facility management to be in a safe condition while a formal path forward is approved.

During the past few months, several issues regarding the safety basis have surfaced. These include this PISA, the readiness assessment finding on the derivation of controls for the Tritium Processing Station, and questions regarding consideration of special tritium compounds (see weekly reports dated October 2 and 30, 2009, respectively). While each of these issues has its own mechanism for resolution, there are likely common contributing weaknesses that warrant attention. The laboratory and the Livermore Site Office (LSO) are currently discussing the scope of the safety basis annual update; this provides an opportunity to identify and agree on a path to improve these weaknesses.

**Plutonium Facility:** The new facility manager reported to duty this week. Formal responsibilities will be transferred following completion of training and turnover processes.

In early November 2009, results of a routine personal dosimetry assessment indicated a potential exposure to a fissile material handler of 132 rem. In response, facility management initiated a dose investigation and restricted the handler from further radiological work until this week, when the investigation was completed. The initial investigation revealed that the level of exposure, which occurred in the month of September, was inconsistent with the levels indicated by other personal dosimetry devices issued to the handler, as well as the exposures received by co-workers involved in similar work activities. Blood tests, including chromosomal analysis, were also performed. The results of these tests further confirmed that the individual did not actually receive the exposure witnessed by the dosimetry. However, reexamination of the dosimetry analysis confirmed that the device had received the indicated level of exposure. A review of the handler's work history for the month suggested that the most likely source of this level of exposure was operation of the radiography cave. Results of subsequent radiological surveys performed on the cave confirmed that appropriate shielding was in place. It was also determined that while the level of exposure experienced by the dosimetry device was possible if it had been placed in the beam path, the energy levels associated with such an exposure were inconsistent. As a result, the source of the exposure to the dosimetry device remains unexplained. LSO intends to have the final report reviewed by the Office of Health, Safety and Security.