

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 25, 2011

MEMORANDUM FOR: Timothy Dwyer, Technical Director
FROM: Jonathan Plaue, DNFSB Site Representative
SUBJECT: LLNL Activity Report for Week Ending March 25, 2011

The Site Representative was out of the office Wednesday through Friday.

Plutonium Facility: Last month, the contractor submitted a safety basis amendment to the Livermore Site Office (LSO) in support of a proposal to downgrade the Emergency Battery Lighting System (EBLS) from safety significant to general service (non-equipment important to safety). The EBLS is currently credited as a safety significant feature for defense-in-depth worker safety for loss of power events, as well as radioactive material spills and glovebox events initiated by a loss of facility power. The amendment asserted that the original designation was derived from management discretion and that the requested change results in no increase to the risk posed to workers or the public. The amendment proposed to reclassify the standalone loss of power event (i.e., not an initiator) as a standard industrial hazard requiring no controls and stated that the frequency of a worker dropping a package coincident with the loss of power is sufficiently infrequent to warrant a safety significant control.

If LSO approves the amendment, the EBLS will remain in place and will continue to be maintained according to National Fire Protection Association standards. The EBLS will also continue to be connected to the safety class Emergency Power System, assuring the restoration of some lighting within a maximum of 120 seconds—currently, the function of the EBLS is primarily to maintain lighting via battery power during this brief transition to emergency diesel-generated power. Overall, the contractor believes significant cost savings will be realized through the reduction of documentation associated with the procurement and maintenance of safety significant items and the elimination of occurrence reports for degraded EBLS conditions.

Nuclear Material Packaging: Recently, contractor personnel completed a draft white paper intended to supplement the *Technical Basis for Storage of Nuclear Materials* in the area of high decay heat loads. In October 2010, LSO personnel raised questions following the thermal failure of a bag-out bag containing an item with plutonium-238 and the subsequent discovery of corrosion on the inside of a juice can containing a different plutonium-238 item (see weekly report dated December 3, 2011).

The white paper breaks the problem into two requirements: (1) maintaining the integrity of the bag-out bag until the item is transferred into an outer container and (2) ensuring that degradation products from the bag (i.e., hydrochloric acid) do not challenge the integrity of the outer container. For the first requirement, program personnel calculated the wattage required to generate a peak surface temperature of 55 °C (assumed to be a conservative failure temperature for a bag) on the inner container. The range of acceptable wattages was determined to be 3.0 W for small elemental containers to 12.4 W for juice cans. For the second requirement, program personnel noted the lack of technical data and asserted that the 5 year packaging review would be sufficient until new containers and a mature technical basis are deployed following deinventory. LSO and other facility personnel are evaluating the white paper and developing a path forward, including evaluating the acceptability of existing packages in the vault.