

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 27, 2012

**MEMORANDUM FOR:** Timothy Dwyer, Technical Director  
**FROM:** Jonathan Plaue, DNFSB Site Representative  
**SUBJECT:** LLNL Activity Report for Week Ending January 27, 2012

**Hardened Engineering Test Building:** This week, program personnel successfully executed Shaker operations with a component containing special nuclear material.

**Startup and Restart:** On January 24, 2012, the Livermore Site Office (LSO) approved the startup notification report for the second quarter. Projected dates for planned startups continued to slip with the current estimates for the near-term readiness reviews showing: February for chlorination; March for the Jerk Tester; April for Project 976a and the West Wing of the Tritium Science Station; and June for the oxidation furnace. The report noted that LSO directed the inclusion of the oxidation furnace based on a unique and important control in the Operational Safety Plan (OSP). The control ensures that plutonium hydride is not introduced into the oxidation furnace, thereby preventing a potentially violent exothermic reaction (see weekly report dated December 9, 2011). LSO is still evaluating whether this control should be elevated to a specific administrative control.

On January 23, 2012, LSO approved the contractor's plan of action for Project 976a. Of note, the plan of action excluded core requirement 10, which examines the drill and exercise program. The justification for the exclusion noted that the drill and exercise program in the Plutonium Facility was recently assessed and found to be successfully implemented. The justification also noted that no new significant emergency scenarios result from the use of high explosives in the facility. LSO emergency management subject matter experts were not asked to review the exclusion. The contractor is attempting to locate documentation supporting this exclusion in response to enquiries from the Site Representative.

**Work Planning and Control:** Recently, program personnel performed an atypical experiment in the hydride/dehydride/casting (HYDEC) unit. The scope of work for the OSP authorizing HYDEC operations states only that the feed material involves a plutonium metal reactant that may or may not be attached to a substrate. The OSP further describes the process to include the gravity driven collection of the plutonium hydride into a dehydride crucible where it is converted back to plutonium metal.

The configuration of the item used in this experiment did not allow for collection of plutonium hydride in the dehydride crucible. As a result, the experiment had the potential to generate a significant quantity of plutonium hydride, which is a pyrophoric material, without an obvious disposition path; however, this did not occur. While the OSP included a criticality safety analysis for this item and provided controls for handling of plutonium hydride, disposition plans for this potential configuration were not documented and would have been challenging. Facility safety office personnel examined the circumstances leading to the experiment and concluded that the experiment had been properly reviewed and that all required work planning and control processes were followed. In the Site Representative's opinion, this experiment underscores the need to better define the scope of work in certain OSPs to facilitate review of atypical operations.