

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 1, 2016

**TO:** Steven A. Stokes, Technical Director  
**FROM:** Matthew P. Duncan, Cognizant Engineer  
**SUBJECT:** Lawrence Livermore National Laboratory Report for June 2016

**DNFSB Activity:** Board Chairman J. Connery and Board Member B. Hamilton—accompanied by staff members T. Dwyer and M. Duncan—visited Lawrence Livermore National Laboratory primarily for familiarization. The Board members walked down the defense nuclear facilities and met with key personnel from the laboratory and the Livermore Field Office.

**Plutonium Facility:** Lawrence Livermore National Laboratory requested permission from the Livermore Field Office to perform unattended off-hours furnace and ion milling operations in the Plutonium Facility. The information supporting the request included proposed changes to the Documented Safety Analysis and Technical Safety Requirements as well as a failure modes and effects analysis for the furnace operation. The definition of Standby Mode would need to be changed to allow for these unattended off-hour operations. For unattended off-hour operations involving the furnace only, the minimum operations shift complement would require a responsible individual to be on call. The amount of material involved in these operations are well below the amount analyzed in the existing Documented Safety Analysis. Though not credited, the furnace has an over-temperature interlock that would de-energize the furnace heating elements if the temperature is too high. The temperature interlock is tested quarterly. The failure modes and effects analysis concluded that the risk of a glovebox fire resulting from unattended off-hour operation of the furnace would be extremely unlikely. The Livermore Field Office is evaluating the proposal.

**Probabilistic Seismic Hazard Analysis:** Lawrence Livermore National Laboratory personnel finished compiling and archiving the final version of the updated Probabilistic Seismic Hazard Analysis this month. As required by Department of Energy Order 420.1C, *Facility Safety*, the laboratory will now determine whether this new analysis indicates there are deficiencies in the design of existing structures, systems, and components. If there are deficiencies, the laboratory will need to develop and implement an upgrade plan, with approval from the Livermore Field Office. Laboratory personnel have performed a preliminary assessment of the impact on the Plutonium Facility and have high confidence that the building structure will continue to have acceptable performance. In addition, the laboratory believes that most structures, systems, and components designed prior to 1992 will easily be shown to have acceptable performance. For those designed after 1992, the laboratory expects additional analyses will be required to demonstrate acceptable performance. The laboratory expects it will take several years to finish all of the required analyses and assessments, including a new nonlinear three-dimensional dynamic analysis of the Plutonium Facility structure. The upgrade plan referred to earlier—if one ends up being required—will therefore not be ready for Livermore Field Office approval for several years.