

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 4, 2009

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

**Plutonium Facility:** Efforts continued to recover from the high temperature alarm experienced on the hydride/dehydride/casting (HYDEC) system (see weekly report dated August 21, 2009). The alarm was determined to have resulted from a malfunctioning solenoid valve on the supply from the facility's positive-pressure chilled water service. This supply serves the limited volume chillers that support the HYDEC system's cooling needs. The malfunctioning valve resulted in insufficient cooling to these chillers. Although cooling is not a credited safety function, it is necessary for programmatic support, particularly for protection of elastomeric seals from thermal degradation. The malfunctioning valve was replaced and additional flow and temperature instrumentation have also been installed. Bounding time and temperature conditions for expected operations have been identified and efforts are underway to exercise these conditions with inert gas atmosphere. The additional temperature indication is being used to demonstrate the adequacy of the cooling system in lieu of an energy balance and heat transfer calculation. Additional formality in the engineering design work associated with the programmatic support functions for this system and other new systems, would reduce the potential for delays during startup, as well as provide a tool that may help expedite recovery from future operational issues. For example, a rigorous operations analysis (e.g., a failure modes and effects analysis) would likely have identified the need for the additional flow instrumentation in the chilled water service supply. A request to facility management for resumption of trial operations with hydrogen is expected next week.

**Tritium Facility Modernization:** The report from the laboratory readiness assessment was issued on August 28, 2009. The team identified five pre-start issues, six post-start issues, and 15 observations. The pre-start issues involve installation of tritium monitors in two of the rooms included in project, lack of procedural adherence with the glovebox inspection surveillance procedure, application of the Unreviewed Safety Question process for the startup plan, compliance issues with the quality assurance plan for procurement documents associated with several components, and disposition of some non-conformance reports. Some of the post-start issues and observations of particular interest involve fire code discrepancies with the segment fire barrier, adherence to the institutional software quality assurance plan, immaturity of the facility drill program, an inconsistent mechanism for communicating turnover information between shifts, a lack of as-built drawings for the fire suppression system, and inconsistencies between the system design description, master equipment list, and the safety basis. On this last point, the report discussed the continued confusion associated with the derivation, definition, and interpretation of the safety function for the safety significant gloveboxes processing more than 600 Ci of tritium. This issue was identified by the management self-assessment and has been dispositioned through a white paper. Closure of pre-start issues is underway and the Livermore Site Office readiness assessment is set to begin on September 14, 2009.