

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 8, 2012

MEMORANDUM FOR: Timothy Dwyer, Technical Director
FROM: Jonathan Plaue, DNFSB Site Representative
SUBJECT: LLNL Activity Report for Week Ending June 8, 2012

Conduct of Engineering: On Thursday, contractor personnel moved the materials characterization glovebox into the radioactive materials area of the Plutonium Facility (see weekly report dated June 1, 2012). Both gloveboxes are now in the facility even though the action items from the final design review performed two weeks ago have not yet been issued. Management approved the effort to move and anchor the gloveboxes based on the completion of seismic calculations. Additional installation steps have not been authorized.

Plutonium Facility: This week, contractor personnel completed in three days their readiness assessment for the oxidation furnace. The oxidation furnace is a fluidized bed reactor used to convert plutonium nitride to oxide as part of the HYDOX process. The startup of the HYDOX process triggered questions from the Site Representative and subsequent engagement from the Livermore Site Office (LSO). LSO directed performance of the readiness assessment and clarified that the safety basis requires the use of 4 % or less oxygen to prevent uncontrolled exothermic reactions involving plutonium hydride (see weekly report dated April 27, 2012).

The three person review team identified two pre-start findings: (1) the procedure used to prepare plutonium nitride and ensure complete elimination of plutonium hydride prior to transfer into the oxidation furnace was not approved and did not appear to appropriately implement the control in the Operational Safety Plan and (2) the procedure for the oxidation furnace could not be performed as written. The team identified four post-start findings including a missing valve on a drawing, component labeling issues, a rogue operator aid, and the lack of fully developed controls for high radiation exposure materials (see next discussion). As lessons learned, the team identified the need to improve coordination of the operational demonstrations, to perform adequate dry-runs of the procedures, and to strengthen the rigor of the management self-assessment (there were no actionable findings). The first two lessons reflect recurring issues.

This summer, program personnel plan to demonstrate disposition options for Zero Power Physics Reactor (ZPPR) fuel plates using the HYDOX and chlorination processes. Both of these processes are new processes with little recent operational history. Although the dose rates for the current ZPPR plates are not currently known, experience in the complex suggests that the plates are likely to result in radiation fields on the order of 30 rad per hour on contact. At these levels, the Health Physicist is required to determine the need for additional shielding, monitoring, and operational proficiency. Personnel are currently developing the plans for the first step in the process—a machining operation used to remove the cladding of the fuel.

Emergency Management: On Thursday, facility operators in the Plutonium Facility participated in their first drill under the facility-level operational drill program. This was the second drill conducted since the drill program document was issued. The scenario involved the unexpected shutdown of the lead exhaust fan for the safety class room ventilation system. The drill leader determined that the operators responded appropriately with immediate notifications, confirmed that the system had appropriately switched over to the backup fan, reviewed applicable procedures, and entered the appropriate limiting condition of operation. Personnel also gained experience with drill scoping (this drill was constrained to 1 hour).