

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 28, 2013

MEMORANDUM FOR: Steven Stokes, Acting Technical Director
FROM: Jonathan Plaue, DNFSB Site Representative
SUBJECT: LLNL Activity Report for Week Ending June 28, 2013

Plutonium Facility: On Tuesday, three workers detected significant levels of radioactive contamination while completing an operation to bag-out bottles of waste solution from a glovebox used to process plutonium-238. The workers detected the contamination on a table used to receive the bagged bottles. The continuous air monitors did not alarm and the contamination was localized to this table; however, the level of contamination was beyond the range of the instrument. One worker also detected moderate contamination levels on his coveralls. The Facility Manager appropriately requested a critique of the event, which concluded there were no issues with the planning, performance of the operation, or the immediate response to the abnormal event. The level of contamination was categorized as a Large Event per the *Facility Safety Plan*, which required the development of a formal recovery plan. Workers successfully completed the recovery on Thursday.

The working theory is that the bag-out bag breached, and management is investigating potential causes, including sharps inside and outside of the glovebox. Notably, a Health & Safety Technician was present for the bag-out as required by the Operational Safety Plan (OSP). The presence of the technician for this event was clearly beneficial. The Facility Manager added this requirement to the OSP after reviewing the recommendations from the plutonium-238 best practices benchmarking effort (see weekly report dated May 10, 2013). The Site Representative notes that program and facility management have not yet incorporated many of the other recommendations from the benchmarking effort, though future efforts are planned.

On June 28, 2013, the Livermore Field Office (LFO) approved the Justification for Continued Operations (JCO) related to the questionable components in the loft (see weekly report dated June 14, 2013). LFO approved the JCO without conditions, but limited the approval period to one year.

On June 21, 2013, the laboratory contractor submitted to LFO a safety basis amendment to allow operations of the oxidation furnace in the Metal Conversion Glovebox with 100 % oxygen. The oxidation process is the final step used to convert plutonium metal to oxide through hydride and nitride intermediates. LFO previously clarified that 4 % oxygen was required to perform this operation because of the potential to create a violent reaction if workers inadvertently introduced plutonium hydride into the pulsed-bed reactor (see weekly report dated April 27, 2012). After operating with 4 % oxygen, program personnel determined that the processing rate was too slow to continue their demonstration work on Zero Power Physics Reactor fuel plates. To mitigate the risk of using 100 % oxygen, the contractor proposed creating a new Specific Administrative Control to ensure that the dehydride process step is accomplished twice at sufficient temperature prior to introducing material into the oxidation furnace. LFO is reviewing the amendment.