

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 10, 2013

MEMORANDUM FOR: Steven Stokes, Acting Technical Director
FROM: Jonathan Plaue, DNFSB Site Representative
SUBJECT: LLNL Activity Report for Week Ending May 10, 2013

Plutonium Facility: On May 6, 2013, the Livermore Field Office (LFO) approved a change to the Technical Safety Requirements (TSR). The laboratory contractor developed the TSR change to create two new Limiting Conditions for Operations (LCO) related to the safety class ducting in the loft and its ability to maintain structural integrity during a postulated 1-hour room fire (see weekly report dated May 3, 2013). The change permits the facility to transition from a generic LCO to the new LCO and avoid REPAIR mode. Specific to the current situation involving questioned ducting components in the loft, the new LCO permits continued operations in affected rooms under reduced material-at-risk (MAR) for a period of up to 60 days. The reduced MAR value is 3.5 kg of 30 year-old fuel grade equivalent plutonium, of which no more than 0.4 kg can be aqueous solutions or 0.1 kg can be plutonium hydride. For perspective, the normal room limit for MAR is 20 kg. The reduced MAR value was based on limiting potential consequences to the public to less than 5 rem and to the co-located worker to less than 100 rem—values for which Department of Energy directives do not require credited controls. On Monday, the Facility Manager implemented the new TSR and placed the three rooms impacted by this condition into the new LCO. In parallel, the contractor continues to execute the formal process for resolving the two Potential Inadequacies of the Safety Analysis (PISA) on this issue.

Waste Storage Facilities: On May 6, the contractor submitted to LFO for approval a Justification for Continued Operations (JCO) related to errors in the dispersion analysis (see weekly report dated March 8, 2013). The JCO formalizes the eight compensatory measures the contractor implemented as part of the PISA process and were accepted by LFO.

Continuous Improvement: On Thursday, facility and program management met to discuss the results of an effort to benchmark best practices for operations involving plutonium-238. A two-person team collected the best practices by traveling to the Los Alamos National Laboratory and the Savannah River Site to study their respective plutonium-238 operations. The team's recommendations included:

- Establish reduced MAR limits, distinct and lower than the criticality safety limits
- Require the use of a written procedure
- Formalize frequent glovebox wipe downs, cleanouts, and sharps controls
- Replace glovebox gloves on a predefined periodicity
- Utilize radiation shielding
- Formally address hydrogen hazards from radiolysis of aqueous solutions
- Procure a “dog house” for use as an interlock during significant contamination events
- Examine improvements to bioassay and wound counting processes

The plutonium-238 operation recently experienced some issues with worker exposure levels and minor contamination events. The Site Representative believes this benchmarking effort was positive and proactive and that implementation of the recommendations will strengthen the operational safety for an enduring high-hazard activity.