

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 3, 2012

**MEMORANDUM FOR:** Timothy Dwyer, Technical Director  
**FROM:** Jonathan Plaue, DNFSB Site Representative  
**SUBJECT:** LLNL Activity Report for Week Ending August 3, 2012

**Tritium Facility:** On Tuesday evening, facility management determined that sufficient information existed to question the operability of pressure gauges used to perform credited surveillances on the Tritium Process Station and Tritium Science Station (TSS) gloveboxes and suspended operations. As part of routine operational oversight, Livermore Site Office (LSO) personnel observed that calibration activities for these gauges utilized only a single data point, in contrast to the manufacturer's recommendation of four points, and communicated this concern to facility management on July 26, 2012. Facility management arrived at their conclusion and filed a management concern occurrence (NA-LSO-LLNL-LLNL-2012-0039) subsequent to additional dialog with LSO on Tuesday. Since 2009, LSO personnel have identified a number of issues regarding performance of this surveillance test involving poor procedure quality, software quality assurance, and calibration equipment quality.

On Wednesday, facility personnel developed a work permit to support performance of the calibration in accordance with the manufacturer's recommendations. By mid-day Thursday, the procedure had been executed and both gloveboxes returned to operations. The use of the correct calibration revealed a single pressure reading on the TSS that was out of specification, which was then corrected.

**Plutonium Facility:** This week, program personnel successfully completed the first operations of the hydride/nitride/oxide (HYDOX) process using nuclear material (depleted uranium). The operation was largely successful, with the exception of difficulties encountered with the dustless transfer system. Personnel were able to remove the crucible and manually transfer the oxide into a different container. Troubleshooting identified that the engineering work used to support installation of flow limiting orifices on the nitrogen supply incorrectly accounted for delivery of sufficient gas to operate the dustless transfer system.

Program personnel expect to perform HYDOX operations on Zero Power Physics Reactor fuel plates next week. Handlers recently removed the cladding from these plates and encountered dose rates of less than 1 rad per hour, significantly lower than the dose rates used for planning.

**Nuclear Material Programmatic Operations:** Last month, National Nuclear Security Administration Headquarters personnel directed the transfer to LLNL of a large number of legacy items containing plutonium-238 for processing and material recovery. During the past several years, program personnel conducted proof of concept testing on a small number of these items. The overall outcome of this testing was successful; however, several operational safety issues were encountered during the course of testing. These issues included unanticipated gas generation in poly bottles, a continuous air monitor alarm, unexpected corrosion of a storage container in the vault, elevated personnel exposure rates, and unanticipated elevated background radiation levels in certain facility locations. Given these issues and the limited operational experience with plutonium-238, the Site Representative believes that it would be prudent to reflect on these issues and implement improvements beyond the initial corrective actions prior to commencing operations with large numbers of these legacy items.