

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 5, 2019

**TO:** Christopher J. Roscetti, Technical Director  
**FROM:** Daniel B. Bullen, Ph.D., P.E., Cognizant Engineer  
**SUBJECT:** Lawrence Livermore National Laboratory (LLNL) Report for June 2019

**Defense Nuclear Facilities Safety Board (Board) Staff Activity:** On June 18–21, 2019, the Board’s cognizant engineer for LLNL observed the Fiscal Year 2019 Superblock Annual Criticality Drill and conducted walkdowns of the Transuranic (TRU) Waste characterization activities in the Waste Storage Facilities (WSF).

**TRU Waste Characterization Activities:** In early June 2019, Lawrence Livermore National Security, LLC (LLNS) began TRU waste characterization activities after receiving restart authorization from the Livermore Field Office (LFO) on May 30, 2019. The characterization activities include; real-time radiography, non-destructive assay, container gas sampling, and gas generation testing. Based upon early operating experience, LLNS estimates that the TRU waste characterization staff can completely characterize approximately seven drums per day (28 drums per week). LLNS also estimates that processing approximately 850 drums will take about 35 weeks (including projected down time for maintenance, holidays, and projected employee leave). LLNS currently projects completion of TRU waste characterization in early calendar year 2020.

**2019 Superblock Annual Criticality Drill:** On June 20, 2019, LLNS completed their annual criticality protective action drill in the Superblock. The purpose of the drill was to ensure Superblock personnel know how to respond to a criticality incident as required by American National Standards Institute/American Nuclear Society (ANSI/ANS) Standard 8.23, *Nuclear Criticality Accident, Emergency Planning, and Response*. All Superblock facilities (the Tritium Facility–Building 331, the Plutonium Facility–Building 332, and the Hardened Engineering Test Facility–Building 334) participated in the drill in accordance with their facility safety plans. The drill scenario involved a simulated criticality event in a glovebox in Building 332 that occurred due to the receipt of a mislabeled material and the subsequent dissolution of that mislabeled material in a nitric acid solution. The scenario resulted in simulated radiation exposure to two workers due to a simulated criticality with no contamination outside of the glovebox. All Superblock personnel appropriately evacuated their facilities and reported to the assigned assembly points. The Alameda County Fire Department, stationed on site at LLNL, responded in approximately 4 minutes, evaluated the situation, performed triage on the simulated exposure victims, and transported the simulated victims for medical treatment. Emergency responders and Superblock staff had some communication issues related to the completion of accountability for all persons in the Superblock at the time of the incident. After the drill, fire department and Superblock personnel discussed these accountability issues to identify potential improvements.

**TRUPACT-II Loading at WSF:** LLNS recently completed a 14-Point Amendment and associated proposed pages changes to the August 2017 WSF documented safety analyses and technical safety requirements and submitted these changes to LFO for approval. LLNS noted that these proposed changes describe the activity, hazards, and controls for the loading of Type B TRUPACT-II casks, which is required by the Waste Isolation Pilot Plant (WIPP) for the shipment of TRU waste containers to WIPP for disposal. LLNS noted that while the lifting activity associated with TRUPACT-II loading is a new hazard with a slight increase in risk, the removal of TRU waste from long-term storage at the WSF is a significant reduction in risk at LLNL.