

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 4, 2023

**TO:** Timothy J. Dwyer, Acting Technical Director  
**FROM:** Daniel B. Bullen, Ph.D., P.E., Cognizant Engineer  
**SUBJECT:** Lawrence Livermore National Laboratory (LLNL) Report for July 2023

**Defense Nuclear Facilities Safety Board (Board) Vice Chair and Staff Interactions:** On July 18–20, 2023, the Vice Chair and members of the Board’s staff were on site to observe the 2023 Annual Emergency Exercise and meet with Lawrence Livermore National Security, LLC, (LLNS) and Livermore Field Office (LFO) managers. On July 24–27, 2023, the Board’s cognizant engineer for LLNL and a member of the Board’s staff were on site to observe activities associated with the maintenance outage at the Plutonium Facility.

**LLNL Annual Emergency Exercise for Fiscal Year 2023 (FY 2023):** On July 19, 2023, LLNL conducted its FY 2023 annual emergency exercise. The exercise scenario included a simulated accident in the Tritium Facility that resulted in simulated serious injury to one facility employee and simulated minor injuries to three additional employees. The Vice Chair and the Board’s staff team observed the response to this incident from the LLNL Emergency Operations Center (EOC), the accident scene, and the Incident Command (IC) post established by Alameda County Fire Department responders. The Board’s staff team observed triage of the seriously injured worker, who was transported to an area hospital, and treatment of the three workers with simulated minor injuries, who were transported to LLNL Health Services. The Board’s staff team also observed communication between the IC, the EOC, and LLNL Health Services throughout the exercise. The Board’s staff will evaluate the after-action report for this exercise when available.

**Submittal of Updates to the Conduct of Operations Matrices for the Superblock and the Radioactive and Hazardous Waste Management (RHWM) Nuclear Facilities:** On July 18, 2023, LLNS submitted the triennial updates of the conduct of operations matrices for the Superblock (Buildings 239, 332, 331, and 334) and the RHWM nuclear facilities. LLNS noted that the transmittal memoranda were provided to address Department of Energy (DOE) Order 422.1, *Conduct of Operations*, Attachment 2, Section 1(d) which states, “...If after the review, no changes are required to the documentation demonstrating conformance to the requirements, a memorandum to that effect may be submitted. It is not intended that minor administrative changes and corrections or routine updates to cited documents would require new DOE approval.” LLNS noted that the triennial updates resulted in only minor administrative changes and routine updates to the cited documents.

**Evaluation of the Safety of the Situation (ESS) for Potential Contamination in the Building 331 Tritium Processing Station (TPS):** On June 29, 2023, LLNS provided LFO the ESS pertaining to a positive unreviewed safety question determination (USQD) for an inadequacy in the Building 331 Documented Safety Analysis (DSA) concerning the TPS uranium bed (U-bed) chilled air lines (see LLNL Monthly Report for April 2023). The USQD identified a concern that U-bed chilled air lines could contain contamination from tritium permeation through piping in the glovebox, and tritium could be released outside of the glovebox if the chilled air line piping external to the glovebox were somehow breached. LLNS noted that this event was not analyzed in the Building 331 DSA. The ESS noted that the TPS glovebox room is equipped with a tritium room monitor covered by technical safety requirements specifications. LLNS noted that the safety significant mitigative control prescribed by the DSA is already in place and operable. LLNS also noted that the worker safety posture is therefore consistent with the DSA analysis should tritium contamination be released into the room from the cooling lines. Therefore, LLNS concluded that no compensatory measures are necessary.