

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 1, 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 November 2023

Defense Nuclear Facilities Safety Board (Board) Staff Interactions: On October 30 – November 2, 2023, members of the Board’s staff observed a criticality safety operational drill in the Superblock, conducted routine oversight activities, and met with Lawrence Livermore National Security, LLC, (LLNS) and Livermore Field Office (LFO) managers and staff. On November 13–16, 2023, a Board’s staff review team performed a review of conduct of operations in the Superblock.

Building 332 (Plutonium Facility) – Justification for Continued Operations (JCO): On October 27, 2023, LLNS submitted a JCO related to a Potential Inadequacy in the Safety Analysis (PISA) for the Room Ventilation System (RVS) exhaust variable inlet vane dampers in Building 332 (see LLNL Monthly Report for August 2023). LLNS noted that locking the vane dampers could potentially interfere with the ability of the safety significant compressed air-Switching panels to perform their safety function of facilitating room egress by preventing excessive corridor-to-room differential pressures. The JCO was developed in coordination with the Evaluation of Safety of the Situation (ESS) and fulfills LLNS’s commitment to provide a JCO within 60 calendar days. LLNS noted that the approval of this JCO will allow the facility to continue to operate while a permanent solution to the discrepant issue is developed and implemented.

Building 332 – Criticality Safety Operational Drill: On November 1, 2023, LLNS conducted a criticality safety operational drill in the Superblock. Members of the Board’s staff observed the drill as part of routine oversight at LLNL. Prior to the drill, Board’s staff members received a briefing describing the scenario and expected responses by building personnel, the Alameda County Fire Department, and LLNL emergency response staff. The Board’s staff team observed the drill at the accident scene, the building egress pathway, and the incident command location. One Board’s staff member accompanied the simulated injured worker to Valley Care Medical Center to observe the response of hospital staff to an injured, contaminated victim. The remaining staff members observed the muster of Plutonium Facility personnel and the response of the fire department and LLNL emergency response staff. LLNS will complete a critique of the response to this operational drill.

Inadequate Initial Confirmatory Process (ICP) Evaluation of Loss of Building 332, Increment 3, Room-to-Corridor Differential Pressure: On October 10, 2023, the Increment 3 RVS Supply Fan Air Conditioning Unit (ACU)-08 malfunctioned, resulting in the room-to-corridor pressure of most rooms within Increment 3 to fall outside of the Building 332 Technical Safety Requirements (see LLNL Monthly Report for October 2023). On November 6, 2023, LLNS staff completed the ICP evaluation for this incident. Based on the ICP, Facility Management decided not to declare a PISA. On November 22, 2023, LFO determined that the conclusion to not declare a PISA for the loss of room-to-corridor differential pressure due to the failure of ACU-08 was incorrect. LFO noted that LLNS did not adequately describe the safety class function of the Increment 3 RVS in terms of supporting functional requirements and performance criteria, nor did it describe the RVS supply system’s contribution to maintaining the room-to-corridor negative pressure as documented in the approved and implemented Building 332 Documented Safety Analysis. LFO directed LLNS to submit an ESS or JCO evaluating the ACU-08 malfunction and impact to the safety-class function of the Building 332 Increment 3 RVS within 60 days.