

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 6, 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 September 2023

**Building 332 Seismic Evaluation and Retrofit - Quarterly Update:** On August 24, 2023, Lawrence Livermore National Security, LLC, (LLNS) provided a quarterly update to the Livermore Field Office (LFO) on the seismic evaluation and retrofit project for Building 332 (see LLNL Monthly Report for June 2023). The update covered progress made by LLNS related to soil-structure interaction (SSI) analysis, evaluation of equipment response to seismic loading, and evaluation of the plenum exhaust building retrofit. LLNS awarded an SSI analysis contract beginning on August 25, 2023. LLNS also began development of a request for offsite services to support a peer review of analyses completed for the seismic evaluation. In addition, LLNS scheduled an Induction Review Board (IRB) to evaluate project execution of seismic strengthening of the plenum equipment building roof. LLNS will also complete a conceptual design of Building 332, Increment 1 retrofits upon completion of the ongoing SSI analysis. LLNS will present the next quarterly update in the first quarter of Fiscal Year 2024.

**Building 332 - Approval of Page Changes to the November 2021 Plutonium Facility Documented Safety Analyses (DSA) and Technical Safety Requirements (TSR):** LFO approved the annual update to the Building 332 DSA and TSR on March 16, 2023, with three conditions of approval (COAs) and directed LLNS to implement the updated DSA and TSRs within 180 calendar days (see LLNL Monthly Reports for April 2023 and August 2023). On September 7, 2023, LFO approved the LLNS response to the COAs concluding that the changes adequately incorporate the COAs, including the directed actions related to designated Defense-in-Depth/Equipment Important-to-Safety (DID/EITS) alarms. LFO approved the submitted page changes, closed the COAs, and directed LLNS to include the page changes in the Building 332 Safety Basis effective immediately.

**Building 332 - Evaluation of Safety of the Situation (ESS):** On September 15, 2023, LLNS submitted an ESS pertaining to the new failure mode of the Building 332, Increment 3, Room Ventilation System (RVS) supply fan ACU-08. On July 27, 2023, the Building 332 Facility Manager declared a potential inadequacy of the safety analysis (PISA) due to new information associated with a failure of a surveillance requirement for the Increment 3 RVS supply fan ACU-08, which requires that the supply fan trips on reduced flow from the Increment 3 lead exhaust fan before the corridor pressure reaches a minimum level lower than atmospheric pressure. Upon inspection, LLNS discovered that a split-pin linkage on the actuating mechanism for the variable inlet vanes (VIV) of ACU-08 that governs the flow rate of the fan had failed. LLNS noted that this new information on the potential effects of ACU-08 and the control system is unanalyzed in the hazard/accident analysis of the Building 332 DSA. Since the split pin linkage has the potential to affect the ability of the RVS to meet its performance criteria in a loss of exhaust flow event, LLNS imposed an operational restriction requiring the RVS cognizant system engineer to direct a quarterly check of the linkage between the VIV and the actuator. If during the inspection, the engineer finds the linkage is not functional, the Facility Manager will prohibit the facility from entering Operations mode until the linkage is fixed. LLNS noted that no additional compensatory measures were required to maintain the facility in a safe condition. LLNS will submit a Justification for Continued Operation (JCO) identifying proposed DSA and/or structures, systems, and components changes to resolve the issues associated with this PISA and the resulting positive Unreviewed Safety Question Determination within 60 calendar days of the ESS.