

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 6, 2023

**TO:** Katherine R. Herrera, Acting Technical Director  
**FROM:** Daniel B. Bullen, Ph.D., P.E., Cognizant Engineer  
**SUBJECT:** Lawrence Livermore National Laboratory (LLNL) Report for December 2022

**Building 322 – Root Cause Analysis Report on Potential Discrepancies Impacting Technical Safety Requirements (TSR) Alarm Setpoints:** Lawrence Livermore National Security, LLC, (LLNS) recently completed a root cause analysis addressing calibration errors in the Building 332 criticality safety alarm system (see LLNL Monthly Report for September 2022). An independent causal analysis team employed the Blue Dragon methodology for conducting causal analyses and complex problem solving. The causal analysis team included several subject matter experts and focused on organizational support functions and programmatic aspects of the issue. The causal analysis team identified three contributing causal factors and two root causes. The root causes included: (1) A Radiation Calibration and Spectroscopy Laboratory procedure did not exist that would have defined how to perform the calibration, the tools used, how to verify and validate results, and the necessary information to communicate to customers about the calibration upon delivery of the source; (2) A quality assurance process, including change management, did not exist to ensure that lab and field calibrations were accurate. The Board’s cognizant engineer will continue to monitor corrective actions completed by LLNS to address this issue.

**Superblock Annual Facility-Level Operational Criticality Drill:** On December 9, 2022, LLNS issued a critique of the annual facility-level operational criticality drill for the Superblock that was conducted on November 9, 2022. The drill scenario began with Building 332 facilities conducting normal operations in the “Operation Mode” when the criticality alarm sounded. Building personnel recognized the alarm, made a rapid evacuation, and reported to the designated assembly point. The drill evaluators concluded that the exercise was effectively executed. The drill evaluators also concluded that all facilities participated and reported to the designated assembly point in accordance with the Facility Safety Plan. The assigned evaluators determined that all objectives were met. The critique identified eleven positive observations and five opportunities for improvement. LLNS conducted this drill in accordance with the American National Standards Institute/American Nuclear Society (ANSI/ANS) Standard 8.23, *Nuclear Criticality Accident, Emergency Planning, and Response*.

**Building 332 – Emergency Power System Diesel Generator Degradation:** On December 13, 2022, the Building 332 Facility Manager determined that the performance of diesel generator GDE07, a component of the safety class Emergency Power System for Building 332, was degraded. A coolant leak was identified on a hose and fitting section of GDE07. The Facility Manager noted that the safety class Emergency Power System was still considered operable due to a redundant generator, GDE04, and the facility remained safe and operable. LLNS staff located appropriate parts on-site and made the necessary repairs.

**First Quarter Fiscal Year 2023 (FY 2023) Startup Notification Report (SNR):** On December 15, 2022, LLNS submitted the first quarter FY 2023 SNR. The SNR identified one startup/restart activity, the restart of the Hydrogen Gas System for the Hydride/Dehydride/Casting (HYDEC) process. LLNS has not operated the Hydrogen Gas System within the last 12 months, which is considered in extended shutdown requiring a readiness review per Department of Energy Order 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities*. The SNR noted that the HYDEC restart activity schedule includes a checklist contractor readiness assessment in January 2023 and a federal readiness assessment in March 2023. LLNS plans to return the HYDEC system to operation in May 2023.