

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 7, 2023

TO: Christopher J. Roscetti, Technical Director
FROM: Daniel B. Bullen, Ph.D., P.E., Cognizant Engineer
SUBJECT: Lawrence Livermore National Laboratory (LLNL) Report for March 2023

Defense Nuclear Facilities Safety Board (Board) Staff Interaction: On March 27–30, 2023, the Board’s cognizant engineer for LLNL and a member of the Board’s staff were on site to observe the Federal Readiness Assessment (FRA) for the Hydride/Dehydride/Casting (HYDEC) process and to conduct routine oversight activities. The cognizant engineer and staff member completed walkdowns of the Superblock and Waste Storage Facilities (WSF), held discussions with Livermore Field Office (LFO) facility representatives for each defense nuclear facility, and met with Lawrence Livermore National Security, LLC, (LLNS) and LFO senior management. The cognizant engineer and staff member met with the Acting LFO Manager and the Acting LFO Deputy Manager. The cognizant engineer met with the LFO Senior Technical Safety Advisor, the LLNS Deputy Principal Associate Director for Operations, and the Weapons & Complex Integration Nuclear Operations Manager to discuss the cognizant engineer’s general observations from this visit and recent potential safety issues.

WSF Documented Safety Analyses (DSA) and Technical Safety Requirements (TSR): On February 27, 2023, LFO approved the revised September 2021 WSF safety basis documents (DSA and TSR). LFO concluded that the resubmitted WSF DSA and TSRs with updated page changes, together with the LFO Safety Evaluation Report, were sufficient and appropriate to serve as the basis for the safe operation of WSF. LFO directed LLNS to implement the updated DSA and TSRs within 180 calendar days.

Building 332 - Annual Update to the Plutonium Facility DSA and TSRs: On March 16, 2023, LFO approved the Annual Update to the Plutonium Facility DSA and TSRs with three conditions of approval (COAs). On November 21, 2021, LLNS provided the initial Building 332 DSA and TSR annual update in which the LFO review team identified several significant comments. LLNS submitted revised DSA and TSR documents on July 13, 2022. LFO evaluated the resubmitted Building 332 DSA/TSRs and concluded that LLNS had successfully addressed six initial COAs but did not adequately address all of LFO’s outstanding comments. As a result, LFO identified three additional COAs and directed LLNS to complete several page changes. The new COAs addressed passive-active neutron (PAN) drum shuffler door closure requirements, combustible loading in the PAN shuffler room, and the development of a new design feature or acceptable alternate TSR control to protect the PAN shuffler housing. LFO approved the resubmitted Building 332 DSA and TSRs with updated page changes noting that the completion of the new COAs and the LFO safety evaluation report serve as the basis for continued safe operation of the Plutonium Facility. LFO directed LLNS to implement the updated DSA and TSRs within 180 calendar days.

Building 332 - HYDEC Process FRA: On March 27–31, 2023, a National Nuclear Security Administration FRA team completed the on-site portion of the HYDEC FRA. The FRA team observed several demonstrations including a demonstration of the HYDEC process, a demonstration of leak testing of the gas supply vacuum piping in the nitride furnace, and a demonstration of the hydrogen gas isolation system. In addition, the FRA team observed an operational drill in the HYDEC facility, reviewed numerous documents, and conducted interviews with operators, system engineers, electrical engineers, quality assurance and software quality assurance managers, configuration management managers, the Superblock safety manager, and the Plutonium Facility manager. The FRA is scheduled to be completed in early April 2023.