

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 3, 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 February 2023

Building 332 - Evaluation of Safety of the Situation (ESS): The Plutonium Facility Manager recently issued an ESS related to suspect material certification for acquired components used in Building 332. On November 23, 2022, the Plutonium Facility Manager determined a Potential Inadequacy of the Safety Analysis (PISA) existed after reviewing additional procurements from a vendor whose quality assurance program was in question. Lawrence Livermore National Security, LLC (LLNS) staff used the procured components for seismic brackets and structural supports in various safety and non-safety applications within Building 332. LLNS staff reviewed the procured material inspection packages and certified material test reports (CMTR) and noted that vendor quality assurance program concerns challenged the validity of the CMTRs. LLNS engineering staff completed an examination of the structural calculations used for design of the components, noting that the calculations used strength values and properties for ASTM A36 steel as the material type provided by the manufacturer. LLNS staff questioned whether the material procured was as ordered and assumed. ASTM A36 steel is the most common plate specification used in structural applications because of its cost and availability. LLNS engineering staff completed an evaluation using the conservative assumption that the material delivered was at a minimum ASTM A9 steel, which has the lowest default yield strength, and calculated that the safety factor would still be greater than 1.0. LLNS completed a backwards looking Unreviewed Safety Question Determination, which was determined to be negative. The Plutonium Facility Manager concluded that no compensatory measures were necessary to maintain the facility in a safe condition.

High Voltage Vault Damaged Near Building 332: On February 6, 2023, a contractor was pouring a small concrete pad near Building 332. The superintendent directed a concrete truck to enter the work area via a driveway which is used to enter the east side of the Superblock. The work area is adjacent to the Superblock fence. The truck driver, instead of using the driveway, decided to use the asphalt walking pathway running north to south on the east side of the Superblock, to access the work area. While driving onto this pathway, the truck crossed over a non-traffic rated high voltage vault, causing the lid of the vault to cave in from the weight of the truck. The caved-in lid contacted cabling inside the vault, damaging the exterior of the insulation but not damaging the conductor. LLNS staff secured the area and electrically isolated the vault. LLNS is tracking this occurrence in the LLNL Issues Tracking System.

Building 332 - Restart of the Hydride/Dehydride/Casting (HYDEC) Process: On February 13, 2023, LFO approved the second quarter fiscal year 2023 Startup Notification Report, which included the startup/restart activity and schedule for the Hazard Category 2 Hydrogen Gas System for the HYDEC process in Building 332. LLNS suspended HYDEC operations in January 2015 due to a re-assessment of the system hazards and controls. LLNS documented the revised safety basis for the system in the Building 332 Documented Safety Analysis (May 2017 Revision). LLNS also revised the Building 332 Technical Safety Requirements to address minor HYDEC modifications including the addition of isolation valves and pressure transducers to the system's vacuum lines. LFO is currently planning a federal readiness assessment (FRA) for the restart of HYDEC operations. The FRA will assess the readiness of the HYDEC system and its ancillary structures, systems, and components, the authorizing work documents to restart HYDEC operations safely and in compliance with the Building 332 safety basis, and applicable facility and institutional processes and programs. The FRA is scheduled to begin March 27, 2023.