

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 2, 2023

TO: Katherine Herrera, Acting Technical Director
FROM: Daniel B. Bullen, Ph.D., P.E., Cognizant Engineer
SUBJECT: Lawrence Livermore National Laboratory (LLNL) Report for May 2023

Building 332 - Hydride/Dehydride/Casting (HYDEC) Process Federal Readiness Assessment (FRA) Final Report: On May 18, 2023, the National Nuclear Security Administration (NNSA) FRA team issued their final report for the HYDEC FRA (see LLNL Monthly Reports for March 2023 and April 2023). The FRA team identified issues in the functional area of Quality Assurance/Software Quality Assurance (QA/SQA) and issued two associated post-start findings. Although the element of SQA did not meet expectations, the FRA team concluded that the QA procurement documents adequately documented appropriate critical characteristics, and technical evaluation specifications were properly flowed down from the authorization basis (AB) calculations to the receipt inspection acceptance tests. The post-start findings in QA/SQA are:

1. Contrary to the Hydrogen Safety Programmable Logic Controller Software Quality Assurance Program (SQAP) Section 3.2 paragraph 2, the HYDEC programmable logic controller (PLC) verification and validation tests were not run when the ladder logic code and components that interface with the PLC were changed.
2. The SQAP was not implemented as required by Institute of Electrical and Electronics Engineers (IEEE) Standard 828-2012, *Software Configuration Management*, IEEE Standard 730-2002, *Software Quality Assurance Plan*, and IEEE Standard 1012-2012, *Software Verification and Validation*.

The FRA team recommended that corrective actions for the first finding be completed prior to the reintroduction of special nuclear material into the HYDEC gloveboxes per the LLNL-approved startup plan. The FRA team determined that the HYDEC system can safely restart and operate. The Livermore Field Office is the startup authorization authority for the HYDEC system.

Improper Hazardous Material Shipment Offsite: On May 17, 2023, LLNL reported an improper shipment of hazardous material. LLNL determined that explosives were transported between LLNL's Site 200 and LLNL's Site 300 in a commercial motor vehicle designated for explosives material without proper packaging and labeling in accordance with Department of Transportation requirements in 49 CFR 171.1(b). This event is related to a shipment NNSA Kansas City National Security Campus (KCNSC) sent to LLNL without proper identification that the shipment contained explosives. Upon opening of the container from KCNSC at Site 200, LLNL staff discovered that the internal packaging was labeled KCNSC High Explosives. LLNL staff shipped the suspect package from Site 200 to Site 300 to be stored in a designated explosives storage facility until the contents could be further reviewed and dispositioned. LLNL staff shipped the package without shipping papers identifying the hazardous material, without the correct packaging, and without marking and labeling identifying that the package contained explosives. During the shipment, the explosives transport vehicle was properly placarded, and the package was secured in the vehicle. Lawrence Livermore National Security, LLC (LLNS) is conducting a causal analysis of the event.

Third Quarter Fiscal Year 2023 (FY 2023) Startup Notification Report (SNR): On May 8, 2023, LLNS submitted the third quarter FY 2023 SNR as required by the Department of Energy Order 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities*. The SNR identified no projects requiring readiness reviews in the next 12 months.