

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 5, 2022

TO: Christopher J. Roscetti, Technical Director
FROM: Daniel B. Bullen, Ph.D., P.E., Cognizant Engineer
SUBJECT: Lawrence Livermore National Laboratory (LLNL) Report for July 2022

Evaluation of the Safety of the Situation (ESS) - Recovery Lab Glovebox (RGL) Seismic Brackets:

On July 21, 2022, the Building 332 (Plutonium Building) Facility Manager issued an ESS addressing the May 27, 2022, Potential Inadequacy of the Safety Analysis (PISA) regarding new information that the quality assurance program and material certificates for the fabricator of glovebox anchor brackets was in question (See LLNL Monthly Report for June 2022). Lawrence Livermore National Security, LLC, (LLNS) reviewed the structural calculations used for the design of the anchorage of the gloveboxes noting that these structural calculations used American Society for Testing and Materials (ASTM) A36 carbon steel as the material type provided by the fabricator for these brackets. LLNS management expressed uncertainty about whether the material procured by the fabricator was as specified. LLNS staff completed an x-ray fluorescence scan of the bracket material and confirmed that the procured brackets are made of carbon steel. LLNS then reviewed the LLNL Engineering Design Safety Standards Manual and noted that any safety factor greater than one is deemed sufficient to ensure the reliability of components made of ductile materials, such as carbon steel, in rare events, such as seismic events. In the original structural calculations, LLNS calculated safety factors for ASTM A36 steel in the RGL glovebox anchoring brackets (Safety Significant) and entry hood anchoring brackets (Defense-in-Depth, Equipment Important to Safety) as 2.1 and 1.5, respectively. LLNS subsequently evaluated whether the use of a different carbon steel, such as ASTM A9 (the lowest default yield strength steel in American Society of Civil Engineers (ASCE) Standard ASCE 41-17, *Seismic Evaluation and Retrofit of Existing Buildings*, Table 4-5 for structural steel applications), would affect the structural calculations. LLNS determined that the weaker A9 material would still result in safety factors of 1.9 and 1.4, respectively. LLNS concluded that these safety factors are sufficient to ensure there is no increase in risk for the facility even if the installed brackets were not A36 carbon steel. Therefore, LLNS determined that the facility can continue to safely operate.

Building 332 – Federal Readiness Assessment for the Restart of Centralized Waste Processing

Line (CWPL) Operations: On July 20, 2022, Livermore Field Office (LFO) approved the commencement of the federal readiness assessment (FRA) for the restart of CWPL operations. LFO based its approval on the results of the contractor readiness assessment (CRA), the resolution of all pre-start findings from the CRA, and the verification and validation of closure of the pre-start findings by LFO staff. The CWPL FRA team began their assessment on July 25, 2022. The FRA team previously shadowed the demonstrations and interviews completed for the CRA. LFO expects to complete the FRA final report in early August 2022.

Revised Building 332 Documented Safety Analyses (DSA) and Technical Safety Requirements

(TSR) Documents: On July 13, 2022, LLNS resubmitted their revised DSA and TSR documents for Building 332. On November 19, 2021, LLNS transmitted the initial submittal of the Building 332 DSA and TSR annual updates. On March 15, 2022, LFO transmitted Review Comment Records (RCR) documents and directed a resubmittal of the DSA and TSR incorporating the resolved RCRs no later than July 13, 2022. LLNS provided draft resolutions to the RCRs to LFO staff prior to this resubmittal letter. LFO will review and approved the revised DSA and TSR documents, if appropriate.