DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 5, 2024

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 2023

Building 332 (Plutonium Facility) – Justification for Continued Operations (JCO) Increment 3 Room Ventilation System (RVS): On December 7, 2023, Lawrence Livermore National Security, LLC, (LLNS) submitted a JCO addressing a Potential Inadequacy in the Safety Analysis (PISA) for the RVS involving an Increment 3 supply fan (ACU-08). (See LLNL Monthly Report for September 2023.) LLNS discovered that a split-pin linkage on the actuating mechanism for the Variable Inlet Vanes (VIV) of ACU-08 that control the flow rate of the fan had failed. LLNS noted that during a loss of exhaust flow transient, this condition may not meet the Technical Safety Requirement corridor pressure specification before supply fan ACU-08 is fully secured. LLNS developed this JCO in coordination with the Evaluation of Safety of the Situation (ESS), submitted on September 15, 2023. LLNS implemented compensatory measures including, "Verify operation of the linkage between the Variable Inlet Vane (VIV) and the actuator by manually manipulating and visually inspecting the linkage conducted under the direction of the RVS Cognizant System Engineer on a quarterly basis." In addition, LLNS will evaluate the split-pin linkage on the actuating mechanism for the VIV of ACU-08 to determine corrective actions that could include: 1) upgrading components, 2) replacing components, 3) modification of the configuration of the system and its settings, or 4) a combination of these changes. LLNS estimates development of proposed corrective actions will take about six months to complete.

LLNL Nuclear Maintenance Management Program (NMMP): On December 13, 2023, the Livermore Field Office (LFO) approved the three-year update to the NMMP with two conditions of approval (COA). (See LLNL Monthly Report for June 2023.) The first COA requires LLNS to modify the section on *Graded Approach* to clarify that the Safety System/Safety Class Structures, Systems, and Components (SSCs) not included in the Master Equipment List, continue to be subject to surveillance as defined in *Types of Maintenance*. The second COA requires LLNS to add the term Surveillance in *Types of Maintenance.* LFO noted that this term may be added to the definition of Periodic Maintenance or as an additional type of maintenance. LFO noted that the language added should clarify that passive Safety System/Safety Class SSCs and/or other systems, which have inspections or tests required by the safety basis, are included in the types of maintenance managed by the NMMP. LFO required that LLNS implement the clarification/addition in the next revision of LLNL MAN-0158, *Maintenance Management Program for Non-Reactor Nuclear Facilities*. LFO will verify completion and closure of the COAs.

Building 331 – LFO Approval of the ESS for the PISA Related to Potential Contamination of Tritium Process Station (TPS) Uranium Bed Chilled Air-Lines: On December 14, 2023, LFO approved the ESS related to potential contamination of the uranium bed chilled air-lines in the TPS in Building 331. (See LLNL Monthly Report for July 2023.) The ESS noted that the hazard of concern was found to be bounded by other analysis, and the tritium room monitor performs as a major contributor to defense-in-depth to protect facility workers. LFO provided a Safety Evaluation Report documenting the LFO review of the ESS, the COA, and LFO's acceptance of the conclusion that no additional operational restrictions or other compensatory measures are necessary. The COA stated that the chilled air-line within the TPS Glovebox shall be designated as part of the TPS glovebox safety significant boundary and updated in the Building 331 Documented Safety Analysis (DSA). LFO required LLNS to submit the analyzed hazard scenario and DSA page changes within 90 days for LFO approval. LFO also stated that safety significant quality assurance requirements shall be applicable to future procurements associated with the chilled air-line.