DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 7, 2025

TO: R.T. Davis, Acting Technical Director
FROM: Sonia G. Thangavelu, Ph.D., Cognizant Engineer
SUBJECT: Nevada National Security Site (NNSS) Report for January 2025

DNFSB Staff Activity: During the week of January 20, a staff team conducted its review of device response methodology and dynamic criticality safety evaluations for Los Alamos National Laboratory (LANL) designed subcritical experiments (SCE) conducted at NNSS. Also, with respect to SCEs, on January 30, the National Nuclear Security Administration briefed the Board on actions taken to address the Board's July 25, 2024, letter for the Enhanced Capabilities for Subcritical Experiments project portfolio and seismic faults within the Principal Underground Laboratory for Subcritical Experimentation (PULSE).

Potential Inadequacy in the Safety Analysis (PISA) for Lithium Ion (Li-ion) Uninterrupted Power Supply (UPS) at Device Assembly Facility (DAF): As mentioned in the NNSS monthly report for August 2024, the Board submitted a letter and report to the Secretary regarding unanalyzed hazards associated with the credited Li-ion UPS at DAF. In the report, the Board concluded that the safety basis does not analyze for a loss of normal lighting concurrent with the loss of emergency lighting (both powered by the credited UPS system) if a single energy event (e.g., fire) occurred in the DAF electrical room. This event can result in insufficient lighting in areas where high explosive operations are occurring at DAF; therefore, preventing the ability to safely suspend assembly activities involving high explosive (HE) operations. On December 11, 2024, Misson Support and Test Services, LLC (MSTS) declared a Potential Inadequacy of the Safety Analysis (PISA) for the unanalyzed hazard and issued an operational restriction to limit HE operations to DAF buildings that contain emergency lighting and battery backup tubes only.

Safety Evaluation Reports (SERs) for Vessel Confinement System (VCS) and High Energy Initiators (HEIs) PISAs at NNSS Facilities: As mentioned in the NNSS monthly reports for October and November 2024, MSTS declared PISAs for the VCS design criteria and HEI vulnerability to safely perform subcritical experiments (SCEs) activities. On January 3 and 13, Nevada Field Office (NFO) issued three SERs and approved three change notices for the DAF, On-site Transportation, and PULSE safety bases respectively in accordance with U.S. Department of Energy Standard 1104-2016, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents* requirements. In response to the VCS PISA, MSTS incorporated new VCS design criteria deviations identified from a LANL technical report and revised the credited VCS safety evaluation into the PULSE and DAF safety bases. NFO concluded MSTS can remove the operational restriction at PULSE to allow SCE receipt. In response to the HEI PISA, MSTS and the nuclear weapon laboratories renamed the use of HEIs specific administrative control (SAC) to the control of electrical environments SAC, revised the SAC safety function and associated performance criteria, and updated the hazard analyses for SCE electrical hazards. The control of electrical environments prevents inadvertent firing of the HE due to radio frequency, electrostatic discharge, and electromagnetic interactions, and it reduces the likelihood of a high explosive violent reaction (HEVR) SCE device response. Specific to the DAF, MSTS also revised the safety bases, hazard analysis, and HE stand-off distance SAC to address the validity of the Faraday-like shield capability of the DAF building structure based on conclusions from a newly issued DAF lightning protection system technical assessment. The SER also identified two issues for the next annual update to the DAF safety bases.