

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 5, 2021

**TO:** Christopher J. Roscetti, Technical Director  
**FROM:** Daniel B. Bullen, Ph.D., P.E., Cognizant Engineer  
**SUBJECT:** Sandia National Laboratories (SNL) Report for October 2021

**Defense Nuclear Facilities Safety Board (Board) Staff Interactions at SNL:** On October 18–21, 2021, the Board’s cognizant engineer for SNL completed on-site nuclear safety oversight at SNL. The cognizant engineer conducted walk downs of the defense nuclear facilities in Technical Area V (TA-V) including the Gamma Irradiation Facility (GIF), the Sandia Pulsed Reactor/Criticality Experiment (SPR/CX), the Annular Core Research Reactor (ACRR), and the Auxiliary Hot Cell Facility (AHCF). The cognizant engineer also met with National Technology and Engineering Solutions of Sandia, LLC, (NTESS) and Sandia Field Office (SFO) managers including; the TA-V Senior Manager, the SNL Associate Laboratories Director for Advanced Science and Technology, the SFO Senior Technical Safety Advisor, and the SFO Manager. In addition, the cognizant engineer provided safety oversight of the loading of Transuranic Packaging Transporter, Model II (TRUPACT-II) containers in TA-V.

**Shipment of Plutonium Isentropic Compression Experiment (Pu-ICE) Containers to Los Alamos National Laboratory (LANL):** On October 21, 2021, two TRUPACT-II shipments containing Pu-ICE containers departed TA-V for LANL. The shipments returned Pu-ICE containers to LANL following the completion of experiments in Z-machine. The Board’s cognizant engineer observed the TRUPACT-II loading operations over the course of three days in TA-V and noted excellent communication and coordination between all participants. Throughout the loading operations, the Board’s cognizant engineer observed no safety issues.

**Causal Analyses for ACRR Hoisting and Rigging (H&R) Events:** On October 6, 2021, NTESS completed a causal analysis on recent hoisting and rigging (H&R) events at the ACRR. The causal analysis reviewed four recent H&R incidents for underlying systemic root causes and contributing factors. NTESS conducted the root cause analysis using the Blue Dragon Hyper-Integrated Causal Analysis methodology. This methodology, which employs a comprehensive, two-phased approach, is widely used at Department of Energy national laboratories and the nuclear weapons complex. The analysis identified seven root causes and six contributing factors. The root causes addressed issues with the development of the critical lift plan (CLP), CLP effectiveness, outdated equipment, unintended use of equipment, personnel training, positioning of personnel during critical lifts, and lack of H&R experience due to high turnover of ACRR personnel. NTESS is developing corrective actions to address the root causes and contributing factors identified in the causal analysis report.

**First Quarter Fiscal Year 2022 Startup Notification Report (SNR):** On October 6, 2021, NTESS submitted the First Quarter Fiscal Year 2022 SNR to SFO. NTESS updated the prior SNR submission to separate the readiness review of Fuel-Ringed External Cavity, Version II (FREC-II) operations from the combined review that included Fielding Experiments Requiring Safety-Class and Safety-Significant Containment. NTESS noted that this change better supports programmatic needs. In addition, NTESS noted that conducting the readiness review of FREC-II operations ahead of the experiment activities affected other proposed startup dates. The FREC-II operations Contractor Readiness Assessment (CRA) is now scheduled for January 2022 with the Federal Readiness Assessment (FRA) planned for February 2022. The Fielding Experiments Requiring Safety-Class and Safety-Significant Containment CRA is now scheduled for May 2022 with the FRA in July 2022.