

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 2, 2022

**TO:** Katherine R. Herrera, Acting Technical Director  
**FROM:** Daniel B. Bullen, Ph.D., P.E., Cognizant Engineer  
**SUBJECT:** Sandia National Laboratories (SNL) Report for November 2022

**First Quarter Fiscal Year 2023 (FY 23) Startup Notification Report (SNR):** National Technology and Engineering Solutions of Sandia, LLC (NTESS) submitted the first quarter FY 23 SNR to the Sandia Field Office (SFO) on October 6, 2022. NTESS determined that two activities planned for the Technical Area-V (TA-V) nuclear facilities in the next twelve months required readiness reviews. SFO agreed with the readiness level determination for these two activities. SFO approved startup of *Class III Experiments with HC-3 Quantities of Fissionable Material (Bambino) at the Annular Core Research Reactor Facility (ACRRF)* in a previous SNR as a Contractor Readiness Assessment (CRA) level. NTESS completed the Management Self-Assessment in June 2022 and the CRA in August 2022. Since the readiness level determination is a CRA, NTESS was the Startup Authorization Authority (SAA) and approved the Plan of Action (POA). The SNR stated the activity is scheduled in December 2022, but NTESS delayed it until the third quarter of FY 23. SFO approved the *Transient Rod Withdrawal (TRW) Operations at the ACRRF* in a previous SNR as a Federal Readiness Assessment (FRA). Accordingly, SFO is the SAA and must approve the revised Plan of Action. SFO approved the first quarter FY 23 SNR on October 21, 2022.

**CRA Plan of Action for TRW Operations at the ACRRF:** On November 2, 2022, NTESS submitted a revised POA for the CRA for TRW operations at the ACRRF. NTESS revised the POA in response to comments from the initial review by SFO staff members. The SFO comments addressed updating an unreviewed safety question determination to address TRW pulses and new equipment failure mechanisms being bounded by existing analyses; clarification of the software and hardware changes associated with TRW operations; and revision of the proposed TA-V drill to require TA-V staff members to recognize an operational emergency, utilize the newly installed public address system to issue protective actions, and account for the staff. NTESS made changes to the POA to address each of these comments prior to SFO approval. SFO approved the revised POA on November 16, 2022. The CRA team is scheduled to begin their assessment of TRW operations on December 5, 2022.

**ACRRF Unplanned Reactor Shutdown:** On November 14, 2022, while ACRRF staff were conducting startup operations, the reactor shut down due to an instrumentation and control (I&C) issue that occurred when ACRRF staff raised the safety rod bank. The safety rod bank, which is routinely withdrawn from the reactor core during startup prior to withdrawal of the control rods, provides the shutdown margin for safe reactor operations. ACRRF staff performed all appropriate steps for Unplanned Reactor Shutdowns and SCRAMs from the reactor abnormal events operating procedure and made all required notifications following the incident. The Nuclear Facility Operations Manager paused all ACRRF operations, and ACRRF management and staff conducted a fact-finding. TA-V engineering staff and ACRRF operators identified a potential control logic error in the reactor control system that appears similar to errors that occurred in the reactor control system over the past few years. TA-V engineering staff noted that these errors appear spuriously. ACRRF staff attempts to reproduce the incident were unsuccessful. The TA-V engineering staff is working with the control system equipment vendor to resolve this issue.