

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 6, 2021

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

**Defense Nuclear Facilities Safety Board (Board) Staff Interactions with SNL:** On July 26–29, 2021, members of the Board’s staff conducted the on-site portion of a review of conduct of operations at Technical Area V (TA-V). The Board’s staff observed in-service fuel element inspection at the Annular Core Research Reactor Facility (ACRRF), completed a tabletop discussion of unirradiated fuel element inspection at the Auxiliary Hot Cell Facility (AHCF), conducted interviews with ACRRF and AHCF staff, and discussed hoisting and rigging procedures for critical lifts at the ACRRF and AHCF. The Board’s staff has requested additional documents and will conduct additional interviews via video teleconference to complete the remaining portions of this review.

**Plan of Action (POA) Approval:** On July 6, 2021, the Sandia Field Office (SFO) approved the POA for *Readiness Reviews of Fielding Experiments Requiring Safety-Class and Safety-Significant Containment and Fuel-Ringed External Cavity (FREC)-II Operations*. National Technology and Engineering Solutions of Sandia, LLC (NTESS) developed the POA to verify readiness to (1) conduct experiments at ACRRF with safety-class containment, (2) conduct experiments at ACRRF with safety-significant containment, and (3) to resume operation of the FREC-II. NTESS will employ a graded approach in determining the breadth of this readiness review noting that specific areas considered in this approach include the magnitude of the hazards involved, the complexity of the activities, restarting of the activities, and other relevant site-specific factors. NTESS plans to complete the management self-assessment in August 2021, the contractor readiness assessment (CRA) in October 2021, and the Federal readiness assessment (FRA) in December 2021, and then begin operations to complete these experiments in February 2022.

**Fourth Quarter Fiscal Year 2021 Startup Notification Report (SNR):** On July 8, 2021, NTESS submitted the Fourth Quarter Fiscal Year 2021 SNR updating plans for four activities in TA-V nuclear facilities in the next twelve months. These activities include portable x-ray (radiation generating device) activities (CRA in May 2022), fielding experiments requiring safety-class and safety-significant containment and FREC-II operations (readiness activity schedule noted above), reactor operations activities to support neutron radiography (CRA in September 2022 and FRA in November 2022), and transient rod withdrawal operations (CRA in September 2022 and FRA in November 2022). NTESS noted that these are notional dates since scheduling and work planning have not been finalized for these activities.

**In-Service Fuel Cladding Inspections at the ACRRF:** During July 2021, NTESS continued in-service fuel cladding inspections at the ACRRF (see SNL Report for May 2021 and June 2021). By the end of July, ACRRF staff had inspected over 100 ACRR fuel elements in the ACRRF reactor pool using the fuel element inspection jig (FEIJ). NTESS employs the FEIJ to measure fuel element concentricity (using a “Go/No-Go” gauge), fuel element mass (using a load cell), and surface condition of the cladding (using an underwater video camera). NTESS also uses the FEIJ to complete two ultrasonic scans (one near the top of the fuel element and one near the bottom of the fuel element) to identify if water has filled the fuel element due to a cladding breach. NTESS plans to complete in-service fuel cladding inspections by the end of August.