

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 7, 2015

TO: Steven A. Stokes, Technical Director
FROM: John R. Mercier, Cognizant Engineer
SUBJECT: Sandia National Laboratories (SNL) Report for July 2015

DNFSB Staff Activity: There were no onsite Board staff reviews or oversight visits in July.

Annular Core Research Reactor (ACRR) Facility Fuel Storage Racks: On June 25, 2015 the National Nuclear Security Administration (NNSA) Sandia Field Office (SFO) sent a letter to Sandia National Laboratory (SNL, hereinafter Sandia) clarifying expectations to implement restrictions to not move fissile material in or out of the ACRR storage racks in either the Reactor Pool or the Storage Pool unless interim measures are formally established (see June 2015 report). Sandia provided initial feedback to SFO on June 30, 2015, indicating that the Reactor Facilities Operation Manager issued a management directive on June 2, 2015, that prohibited movement of fuel or other items for all fuel storage racks, save one. The directive clarified that the 18-element transfer rack may be used since it has a criticality safety analysis (CSA) compliant with current DOE standards. Following discussions with SFO in July 2015, Sandia further clarified that nuclear material movements below the threshold limit do not require a CSA. On July 28, 2015, Sandia provided additional feedback to SFO stating that the ACRR Documented Safety Analysis (DSA), and not the Sandia nuclear criticality safety program, applies to fissile material activities inside the reactor pool for reactor operations, maintenance, and shutdown. Sandia also provided an engineering evaluation to support movement of up to 20 fuel rods within the existing scope of the ACRR DSA. For the storage pool, Sandia committed to complete a comprehensive CSA for all storage racks by June 30, 2017.

Positive Unreviewed Safety Question Determination (USQD) for the ACRR: On July 12, 2015, Sandia submitted the Evaluation of the Safety of the Situation (ESS) for the ACRR that addressed a positive USQD for regulating rod withdrawal speeds. Sandia determined that potential non-conservative assumptions were applied in the accident analysis related to the speed at which regulating rods could withdraw in an accident condition. Sandia stated that existing controls adequately mitigate the risk and concluded that the ACRR is in a safe condition. Sandia committed to modifying the facility safety basis in a subsequent revision to address the potential non-conservative assumptions in the accident analysis. The ESS is under review by SFO.

Radiation Levels in the ACRR High Bay Areas: Sandia determined that radiation areas exist in the ACRR High Bay during steady state operations (1%-10% power) due to a change in shielding configuration to support researcher experiments. Sandia implemented compensatory measures, conducted a causal analysis, and is undertaking radiation level characterizations to determine the need for additional radiation postings for High Bay areas for varying reactor operating configurations.

Unknown Container in Monorail Storage Area: In late May 2015, Sandia personnel attempted to retrieve two legacy experiment assemblies to be repackaged in the Auxiliary Hot Cell Facility (AHCF). The containers were stored adjacent to the Hot Cell Facility, a less than Hazard Category-3 nuclear facility. During that operation, Sandia discovered an unexpected container in a storage silo (see June 2015 report). Since then, Sandia conducted a cursory radiation survey of the container followed by a thorough records review. At present, Sandia believes the container is contaminated with a long-lived fission product and does not hold nuclear material. Sandia intends to further characterize the container to ensure compliance for an appropriate disposal pathway.