

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 8, 2019

**TO:** Christopher J. Roscetti, Technical Director  
**FROM:** Matthew Duncan and Brandon Weathers, Resident Inspectors  
**SUBJECT:** Oak Ridge Activity Report for Week Ending November 8, 2019

**DNFSB Staff Activity:** J. Abrefah, F. Bamdad, D. Shrestha, and S. Thangavelu were on site to conduct a follow-up meeting with NPO personnel regarding the staff's review of hazards associated with materials in the Highly Enriched Uranium Materials Facility (see 4/19/19 report). D. Shrestha also augmented resident inspector coverage during the week.

**Nuclear Criticality Safety:** Last week, a meeting was held between NPO and CNS personnel to discuss NPO observations regarding the level of nuclear criticality safety analysis performed by CNS in response to identifying out-of-service systems and components in Building 9212 that do not meet the requirements of the Y-12 nuclear criticality safety program (see 10/25/19 report). After this meeting, CNS agreed to complete additional nuclear criticality safety analysis to achieve compliance with the Y-12 nuclear criticality safety program for the out-of-service systems and components that have U-235 masses above 700g.

Prior to completing the Building 9212 out-of-service equipment uranium holdup evaluation, CNS added the out-of-service carbon burners and destructive distillation units to the list of systems planned to be isolated and cleaned out in fiscal year 2020. Unanalyzed uranium holdup in the exhaust ductwork and filters of the carbon burners and destructive distillation units was identified in late 2018 (see 12/7/18 and 12/14/18 reports). This discovery led to the recently completed uranium holdup evaluation of other Building 9212 out-of-service equipment.

**U-233 Disposition Project:** A resident inspector and the DNFSB headquarters cognizant engineer observed operations in Building 2026 for the Oak Ridge Oxide Processing campaign that is processing U-233 for thorium extraction. This week, processing of the first U-233 canister was completed and the initial shipment of thorium left Oak Ridge. The campaign plans to continue processing U-233 from the lower mass canisters allowed under the current operational restriction (see 9/27/19 report). The resident inspector and cognizant engineer discussed a recent fix to a connection between the vacuum pump and roto-evaporator that was made after investigating difficulty in reaching the desired pressure for evaporation. Chemical sampling was performed for the initial U-233 lot and the fissile material content was in close agreement with historical process records.

**Modular Facility Operation:** A resident inspector and the DNFSB headquarters cognizant engineer walked down the modular facility with NPO and CNS personnel (see 7/5/19 and 9/20/19 reports). Construction personnel are completing onsite configuration of the modules, installation of equipment, and site preparatory work. CNS has transmitted the modular facility final hazard categorization documents to NPO. The documents conclude that an inadvertent nuclear criticality is not credible and that the facility is Below Hazard Category 3 as established in DOE Standard 1027, *Hazard Categorization of DOE Nuclear Facilities*. Prior to performing operations with enriched uranium in the modular facility, NPO must approve the facility hazard categorization.