DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 7, 2018

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending December 7, 2018

Staff members F. Bamdad, L. Lin, D. Shrestha, and S. Thangavelu were on site to conduct a review of the Building 2026 Preliminary Documented Safety Analysis for the uranium disposition project (see 9/21/18 report).

Building 9212: During briquetting operations on 11/26/18, a newly created uranium briquette (compressed uranium machining chips) began to spark when chemical operators attempted to remove it from an inert, argon atmosphere. The operators put the sparking briquette back in the argon-filled removal box and then backed away and established administrative control of the area. While the Ultrasonic Chip Cleaning system has been out-of-service, CNS has been using a "triple rinse" method and no ultrasonic cleaning in the briquette generation process (see 7/26/18 report). In the current briquetting operations, briquettes are processed shortly after being created using the Building 9212 skull burner to convert the uranium metal briquettes to oxide. This minimizes the amount of time between briquette generation and when they are converted to a more stable chemical oxide form in an effort to reduce the risk of briquettes spontaneously igniting. There have been several prior instances of briquettes undergoing an exothermic reaction during storage or handling (see 8/18/17 and 2/26/18 reports). The 11/26/18 event is the first known instance where a newly generated briquette immediately reacted when exposed to air. When the event occurred, there were approximately two briquettes worth of unpressed machining chips in the briquette press box which is also an inert, argon atmosphere enclosure. At the fact finding meeting, operators noted that the machining chips used to create the sparking briquette were visually different and appeared drier than previous machining chips processed with the "triple rinse" method. The machining chips had been stored in chip dollies for over six months in Building 9212 prior to the beginning of briquetting operations to process them.

CNS's recovery plan is to remove the briquette that sparked from the argon-filled removal box and place it in an argon-filled plastic bag. The bagged briquette will then be put in an argon-filled storage can that is taller than typically used for briquette storage. The taller storage can provides a larger volume that can be occupied by argon. A plastic bag containing carbon microspheres will be placed on top of the bagged briquette. In the event that the bagged briquette resumes its reaction, the bag containing carbon microspheres will melt and release the carbon microspheres. The carbon microspheres will fall on the reacting briquette and smother it to extinguish the reaction. The briquette is planned to be processed in the skull burner.

Building 9212: Nuclear criticality safety (NCS) personnel identified a potential NCS issue associated with unanalyzed uranium holdup in the exhaust ductwork and filters for out-of-service carbon burners and other equipment. The scope of the walk downs performed as part of the uranium holdup extent-of-condition did not include out-of-service equipment (see 11/9/17, 3/30/18, 4/20/18, and 5/4/18 reports).