DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 27, 2018

TO: Steven A. Stokes, Technical Director
FROM: M. Forsbacka and M. McCoy, Acting Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending April 27, 2018

Highly Enriched Uranium Materials Facility (HEUMF): Last week, NPO approved the justification for continued operation (JCO) and evaluation of the safety of the situation for the potential inadequacy of the safety analysis (PISA) declared for the 16 drums containing material forms not currently analyzed in the HEUMF documented safety analysis (DSA) (see 4/20/18, 3/2/18 and 3/16/18 reports). In its Safety Evaluation Report addendum, NPO provided a basis for approval that was developed by an integrated team of safety basis engineers, a facility representative, a criticality safety engineer, and a fire protection engineer. The team evaluated an estimated calculation produced by CNS for the Drum Rack design basis fire. They noted that the updated damage ratio and airborne release fractions were accurately representative of the material type in the 16 drums. They also agreed that CNS had conservatively estimated the maximum material at risk by using bounding values for mass in the drums. CNS's dose calculations to the public and collocated worker increased slightly; however, the values remained well below the evaluation guideline values. NPO found that existing safety significant controls for the design basis fire and CNS's proposed compensatory measures adequately mitigate risks for the ignitable materials contained in the 16 drums. The compensatory measures are considered to be TSR level controls and will remain in place until the JCO is retired. An additional eight drums with similar materials were discovered as part of an ongoing extent of conditions review. On Wednesday, CNS made a new positive Unreviewed Safety Question Determination associated with the eight drums discovered.

Building 9212 Fire Protection System: Earlier this month, maintenance personnel turned off a supply fan in Building 9212 in order to replace a degraded firewater supply pipe to sprinklers in the supply fan. The fan was left in the off state and the steam supply remained on after workers completed the maintenance activity. Last week, the fan supply housing overheated as a result of the fan off/steam on condition, resulting in the inadvertent activation of a safety-significant fire suppression sprinkler. On 4/25/18, CNS personnel held a fact-finding for the event. The fact-finding team developed a detailed timeline of the event and discussed the connection between the fan operational mode and the steam supply settings. They also analyzed management actions and found that management had promptly entered the correct limiting condition for operations and rendered the effected sprinkler operable again before the end of the shift. Additionally, correct responses were taken to water intrusion in nearby electrical systems and a decontamination area, resulting in a localized power shutdown and the movement of contaminated materials.

The fact-finding team identified a number of actions to reduce the possibility of similar inadvertent sprinkler activation; however, they noted that an automated control system of the steam lines and fans could have precluded the inadvertent activation, as steam and fan temperature controls currently depend on personnel action. Similar events involving sprinkler activation as a result of fan off/steam on condition occurred in Building 9202 in 2015 and 2016, and in Building 9206 in 2015 (see 12/4/15, 1/8/16, and 2/22/16 reports).