

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 13, 2017

TO: Steven Stokes, Technical Director  
FROM: Jennifer Meszaros and Rory Rauch, Resident Inspectors  
SUBJECT: Oak Ridge Activity Report for Week Ending March 10, 2017

**Highly Enriched Uranium Materials Facility (HEUMF):** CNS Safety Analysis Engineering is currently evaluating whether new information regarding the HEUMF safety-significant power distribution system (PDSS) represents a potential inadequacy in the safety analysis. They entered the new information process after the PDSS failed a technical safety requirement surveillance for the third time in approximately one year due to a low coolant level alarm that unexpectedly shut down the system's diesel generator (see 3/3/17 report).

**Material-at-Risk (MAR) Reduction/Building 9212:** The NPO safety basis approval authority recently approved a CNS safety basis supplement that authorizes removal of uranyl nitrate crystals from Building 9212. Uranyl nitrate crystals represent one of the highest hazard forms of uranium in Building 9212 and their removal from the facility is a key component of ongoing MAR reduction efforts (see 10/7/16 report). Last year, CNS Y-12 enriched uranium mission transformation personnel identified that Building 9212 MAR inventory did not meet fiscal year 2016 reduction goals, in part due to safety basis issues that prevented shipment of the remaining crystal inventory to HEUMF (see 1/27/17 report). Once implemented, the safety basis supplement will authorize shipment of the crystals from Building 9212 to HEUMF via the special nuclear material vehicle. CNS plans to ship the crystals from HEUMF to an offsite customer.

**Operational Safety Board (OSB):** The Y-12 Development organization held a meeting of the OSB this week to discuss a planned activity to disposition mercury waste that contains low levels of radiological contamination. In June 2016, CNS tested a method for stabilizing this waste by combining it with powdered sulfur and steel milling balls in three paint cans and shaking the cans to promote the formation of a stable mercuric sulfide. They ceased the activity after agitating two of the three cans because they observed signs of an energetic reaction (see 6/24/16 report). The OSB discussed plans to stabilize the third can, which was never agitated, by adding magnesium oxide sand (CNS believes that the other two are fully reacted and do not require additional treatment). The sand prevents the milling balls from moving during transit and promoting the exothermic reaction between mercury and sulfur. The sand may also serve as a heat sink for any reaction that does occur. All three cans will be over-packed in a 30-gallon drum, and shipped offsite for final treatment and disposal. The OSB approved this activity, with minor modifications.

**NPO Oversight:** Last week, NPO issued a report to CNS identifying concerns in key areas such as quality assurance, nuclear safety, and issues management. Of note, NPO identified a management concern (MC) related to performance culture that is illustrated by recent events at both Y-12 and Pantex involving, for instance, comingled waste streams, hazards and controls not communicated prior to work initiation, and a procedure made effective prematurely (see 10/28/16 report). The report indicates that collectively, these events illustrate the CNS plan for achieving performance excellence is still maturing. Additionally, NPO identified emerging items of interest (EIIs) related to the quality and timeliness of CNS documented safety analysis submittals and the implementation of the CNS issues management process. The NPO letter issuing the report requires CNS to respond to the newly identified MCs and EIIs within 30 days.