

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 24, 2016

TO: Steven Stokes, Technical Director
FROM: William Linzau and Rory Rauch, Site Representatives
SUBJECT: Oak Ridge Activity Report for Week Ending June 24, 2016

Staff member R. Tontodonato was on site this week shadowing site rep activities.

Work Planning and Control (WP&C)/Conduct of Operations: A CNS Waste Management engineer observed an unexpected reaction during testing of a treatment method for waste mercury containing low levels of radiological contamination. The process involved placing 1 kg of sludge containing mercury and powdered sulfur into a paint can with steel milling balls. The sealed can was enclosed in three layers of plastic bags and agitated on a paint shaker for 2 hours to promote the formation of stable mercuric sulfide. About 40 minutes into the test, the radiological control technician (RCT) monitoring the activity smelled an unusual odor, stopped the shaker, and exited the trailer. The RCT informed the responsible engineer, who observed that the inner plastic bag had melted. The engineer removed the can from the shaker and placed it in the trailer's HEPA-filtered hood. He then decided to proceed with the next batch after unsuccessfully attempting to contact a contracted mercury subject matter expert. The next batch was twice the mass of the first and ran for 8 minutes before the outer bag inflated and the engineer heard the can hissing. Upon closer inspection, the engineer noted scorching of the inner plastic bags. He immediately exited the trailer, and called the Plant Shift Superintendent to initiate emergency response. The fact-finding meeting revealed several deficiencies in WP&C and conduct of operations, including the lack of adequate hazard analysis, failure to follow the test plan, and failure to include this testing on the work area's Plan of the Day. CNS held a critique to facilitate senior management-level evaluation of the event and corrective actions.

Nuclear Criticality Safety (NCS): Last week, the CNS Director of Y-12 Engineering provided NPO a summary report documenting ongoing and completed improvements to the NCS program. The start of these improvement efforts dates back to the issuance of DOE-STD-3007-2007 and several reviews of Y-12's NCS program, including an NNSA headquarters assessment that identified the need to improve the technical bases for Y-12 NCS evaluations. The contractor completed several corrective actions to address this assessment's findings and continues in its efforts to improve criticality safety evaluations (CSEs). For example, the site recently developed a writer's guide to set expectations for new and revised CSEs, which further improved the NCS program and supported the establishment of design requirements for UPF. Many of these improvement actions, such as the multi-year effort to review the implementation of NCS controls (see 4/5/13 report), were captured in a site key initiative which was completed in September 2015. The summary report provides additional on-going actions designed to ensure the continued health of Y-12's NCS program.

Operational Drills: This week, the site reps and staff observed a facility-level drill in Building 9225-3 (Purification Facility) in which operators had to respond to a simulated spill involving dry chemical product. The operators and supervisors followed the facility's spill response procedure without issue. This drill was the continuation of the re-initiation of CNS's facility-level drill program (see 4/22/16 report). The coordination of drill controllers was improved as additional controllers were utilized to provide better coverage of response actions.

Uranium Processing Facility (UPF): An NPO review team initiated its review of the recently submitted Preliminary Safety Design Report. The team includes representatives from nuclear safety, NCS, fire protection engineering, system engineering, and operational oversight. The team plans to produce a Preliminary Safety Validation Report by November 2016.