DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 26, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending July 26, 2019

Nuclear Criticality Safety: Last week NPO received a Central Technical Authority (CTA) position regarding the DOE Order 420.1C, *Facility Safety*, requirement that "criticality safety evaluations must show that the entire processes involving fissionable materials will remain subcritical under normal and credible abnormal conditions, including those initiated by design basis events." Currently, most criticality safety evaluations for Y-12 nuclear facilities do not evaluate all design basis events, including seismic events, large fires, aircraft crashes, high wind, roof ponding, flooding, and external explosions. For some Y-12 nuclear facilities, the documented safety analysis acknowledges the potential for a criticality accident to occur after some design basis accidents. The CTA position endorses an approach for criticality safety evaluations to evaluate process-specific credible abnormal conditions that are initiated by natural phenomena design basis events only up to the magnitude that an existing facility will survive.

The Extended Life Program (ELP) for Buildings 9204-2E, 9215 and 9995 is designed to identify legacy risks, mitigate those risks where practical, and document where risks should continue to be accepted since these facilities are planned to continue operating past 2040 (see 11/14/16 report). The ELP safety strategy currently plans to develop more detailed criticality safety analyses for design basis accidents, but the CTA position may alter this approach. CNS intends to update the ELP safety strategy this year.

Waste Shipments: The resident inspector attended one of several safety briefings at Y-12 related to compliance with radioactive waste packaging and shipping requirements. This is part of a DOE complex-wide safety pause after CNS's noncompliant shipments of material to the Nevada National Security Site (see 7/19/19 report). The briefing reviewed previous waste compliance issues that have occurred at Y-12 and other waste generating sites. It emphasized the importance of fully understanding processes and changes to them prior to generating waste. The site is developing a strategy and identifying areas onsite that can accommodate storage of Y-12 waste while the waste certification program is suspended.

Building 9212: On Tuesday, hydraulic fluid was found in an enriched uranium casting furnace enclosure. The hydraulic fluid leaked from the hydraulic cylinder that is used to vertically move the stack assembly into and out of the furnace. After raising the stack assembly into the furnace, operators noticed a puddle of hydraulic fluid in the furnace enclosure. The operators stopped and established administrative control of the area. An inspection after the event did not identify any additional hydraulic fluid leaks in the furnace enclosure. An initial event notification was made on the same day of the event and a fact finding meeting is planned for next week.

U-233 Disposition Project: The resident inspectors met with personnel from DOE Oak Ridge Environment Management and Isotek Systems, LLC to review and discuss the historical process records associated with preparing, packaging and storing the U-233 material that will be used in the upcoming Oak Ridge Oxide Processing campaign (see 6/28/19 report).