

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 4, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending January 4, 2019

NNSA Production Office (NPO) Assessment: On December 20, 2018, NPO issued a final report for the enhanced shadow assessment of unexpected uranium accumulation discoveries at Y-12 between July 2017 and April 2018 (see 7/14/17, 11/9/17, 12/15/17, 2/16/18, and 3/30/18 reports). The scope of the assessment was to evaluate the effectiveness of the contractor execution of requirements associated with occurrence reporting, extent of condition review, causal analysis, and corrective action tracking during the series of uranium accumulation discoveries. Review team members included NPO subject matter experts (nuclear criticality safety and quality), NPO facility representatives, NNSA headquarters staff, and a member of the DOE Criticality Safety Support Group.

Through the assessment, NPO determined that the extent of condition review was effectively performed to address the underlying causes of the uranium accumulation discoveries and that the extent of condition review was compliant with the governing requirements. One finding, thirteen observations and one noteworthy practice were identified by the assessment team.

The finding was that the NPO assessment team considers a higher significance category to be applicable to one of the occurrence reports. Some of the observations are related to:

- Lack of communication between personnel in different organizations. For instance, Nuclear Criticality Safety (NCS) engineers were not contacted or informed by Nondestructive Assay (NDA) personnel of accountable material inventory differences. Nuclear Material Control & Accountability is the NDA customer organization for the material inventory measurements and therefore NCS is not informed of accountable differences by NDA personnel.
- The need for criticality safety evaluations (CSEs) to be reviewed in a defined periodicity with approved reaffirmation and reauthorization. The assessment report noted the average age of CSEs in Building 9212 is 5.7 years.
- The use of implicit assumptions in some CSEs. The assessment team suggested the use of a formal hazard analysis process, including greater involvement of criticality safety officers in the process, to strengthen CSE development.
- Process changes involving modifications to feed materials or throughput rates have a less formal evaluation process than changes that involve equipment configuration or technical procedures. Examples of process changes that were not fully evaluated are: (1) reducing the frequency of the Building 9212 casting line material inventory from 2 months to 6 months; and (2) significantly increasing the throughput of briquettes through the casting line.
- Uranium holdup beneath Large Geometry Exclusion Area flooring should be considered for additional evaluation as part of the extent of condition review.