

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 25, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending October 25, 2019

Building 9212: As part of continued actions from earlier unexpected uranium holdup events, CNS notified NPO that 48 out-of-service systems and components in Building 9212 do not meet the requirements of the Y-12 nuclear criticality safety program. The recently completed evaluation covered 151 out-of-service systems and components. At least five of the systems are known to have uranium holdup present that is greater than the 700g U-235 single parameter subcritical limit for non-uniform aqueous mixtures. These five systems do not have an effective or suspended criticality safety evaluation. Therefore, no nuclear criticality safety analysis was found to document specific barriers or controls that may form a basis for the as-found conditions being safe with respect to nuclear criticality safety. Some of the components with the largest holdup masses have been known to contain these holdup amounts since at least 2004, yet were not analyzed in an effective or suspended criticality safety evaluation.

CNS reported the issues identified under the management concern criterion of DOE Order 232.2A, *Occurrence Reporting and Processing of Operations Information*. A management concern is the lowest report level (informational). DOE Order 232.2A contains a criterion at the highest report level for nuclear criticality safety control violations where a condition exists with no documented controls available to prevent a criticality accident and non-documented barriers or controls are relied on. An NPO assessment from December 2018 identified a finding that CNS did not report a previous uranium holdup discovery in the reduction sand separator under this higher occurrence reporting criterion. CNS site-specific guidance on occurrence reporting takes a broad interpretation of documented controls with respect to this occurrence reporting criterion. In another uranium holdup discovery this year, CNS initially did not file an occurrence report for unanalyzed uranium holdup found in the ultrasonic chip cleaning solvent recovery system but later decided to update a previous occurrence report for the system after being questioned by NPO and the resident inspectors (see 4/12/19 and 4/19/19 reports).

Three of the 48 out-of-service systems and components that lack a current basis for criticality safety were previously reported in two nuclear criticality safety deficiencies. When the Building 9212 out-of-service equipment evaluation was issued last week, the other 45 systems were consolidated into four nuclear criticality safety infractions (one deficiency and three minor-non-compliances). If the events were filed individually, the number of deficiencies in 2019 would have increased from 22 to 31 and minor-non-compliances would have increased from 15 to 51.

The Building 9212 out-of-service equipment evaluation risk ranked the 151 out-of-service systems and components for use as an input to prioritization decisions of future cleanout and permanent system isolations as part of the Building 9212 exit/transition strategy. It will likely be several years before all isolations are completed or material is cleaned out. CNS does not plan to create criticality safety evaluations for the out-of-service equipment to formally document barriers or controls in the interim. CNS personnel are in the process of conducting similar evaluations of out-of-service equipment in Buildings 9215 and 9204-2E. Those evaluations are scheduled to be completed by September 30, 2020.