

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 18, 2017

TO: Steven Stokes, Technical Director
FROM: Jennifer Meszaros and Rory Rauch, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending December 15, 2017

Building 9212/Nuclear Criticality Safety (NCS): Enriched Uranium Operations (EUO) management placed casting operations on hold this week after NCS engineers identified that significant quantities of uranium can accumulate under casting line hoods. As part of the extent of condition review associated with the accumulation of uranium in the geometrically unsafe reduction sand separator (see 11/9/17 report), NCS engineers recently noted that the casting criticality safety evaluation does not consider the possibility for inadvertent uranium accumulation under casting line hoods. As such, they reviewed data from a semi-annual cleanout activity that occurred in September and discovered that a combination of uranium oxide, uranium metal, and graphite accumulated under the casting hood in four distinct locations. The highest mass retrieved from any of the four locations contained approximately 9 kg U-235.

The subcritical limits for water-reflected masses of U-235 metal and/or oxide listed in ANSI/ANS-8.1, *Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors*, are at least double this worst-case mass. NCS engineers utilized this information to write a temporary addendum to the criticality safety evaluation that authorized additional cleanout of material that may have accumulated in the four identified locations under the casting line hoods during the last three months. They are currently developing a second temporary addendum that will authorize restart of casting operations and require weekly cleanouts of the areas under the casting line hoods. NCS engineers will later utilize data from these weekly cleanouts to revise the casting criticality safety evaluation. EUO management does not yet know whether this holdup issue will impact their plans to cast briquettes at an elevated rate beginning early in calendar year 2018 (see 12/1/17 report).

Transuranic Waste Processing Center (TWPC): This week, North Wind personnel completed an implementation verification review (IVR) of the safety basis revision that addresses the recent unreviewed safety question involving inner lid deformation on macro-encapsulated waste boxes (see 11/24/17 report). The safety basis revision primarily involves changes to safety-significant design features that are credited to restrict the location and depth of tool penetrations on the inner lid. These restrictions prevent an inadvertent puncture of the unvented waste drums located within the boxes. The IVR team identified two training-related pre-start findings, which were closed during the review, and ultimately concluded that operations personnel are ready to implement the new safety basis revision. The resident inspectors observed a demonstration of the new tools as part of the contractor's preparatory management self-assessment and identified no issues. North Wind management anticipates resuming operations to remediate macro-encapsulated, unvented waste drums in the coming weeks.

Building 9212/Oxide Conversion Facility (OCF): This week, the resident inspectors walked down the dock on which several credited OCF systems are located. During the walkdown, the resident inspectors observed a new, credited hydrogen fluoride (HF) isolation valve recently installed after system operators identified evidence of a minor HF leak caused by a defect in the valve body (see 10/27/17 and 11/9/17 reports). Additionally, they discussed with the responsible system engineer the extent of condition testing performed on portions of HF piping as a result of the defect and inspected both credited and non-credited system components. OCF operations remain paused while EUO management plans necessary weld inspections of the newly-installed valve.