

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 28, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending June 28, 2019

DNFSB Staff Activity: D. Shrestha visited Oak Ridge to augment resident inspector coverage.

Nuclear Criticality Safety (NCS): There were three instances where molten enriched uranium did not flow as anticipated during casting operations in Building 9212. After the second and third instance of this happening, CNS determined that a key component in the knockout plugs was missing. The component was required to be installed by procedure and by the criticality safety requirements for the operation. Full and partial “failures-to-pour” along with other anomalies are anticipated conditions, but the applicable abnormal operating procedure is on hold due to a problem with the sequencing of its steps, requiring administrative control and NCS guidance each time this occurred. CNS inspected all remaining knockout plugs and discovered five more that were missing the same component. They were repaired or destroyed promptly. This was considered a deficiency.

Two residue cans were loaded approximately 10% above the 300 g U-235 limit per residue can for a storage array in Building 9212. NCS personnel provided guidance to safely approach and relocate the cans to an approved storage array. This was considered a deficiency.

Water was discovered in a stainless steel pan containing enriched uranium metal in the pack and ship area of Building 9212. An extent of condition discovered other pans also contained water. NCS personnel provided guidance regarding how to recover. This was considered a deficiency.

Operators responded appropriately when they discovered enriched uranium metal fines in a green salt can during an operation in Building 9212 where the criticality safety evaluation prohibits them. NCS personnel evaluated the situation. The material was placed back into the green salt can and returned to an approved storage location. This was considered a minor noncompliance.

U-233 Disposition Project: A resident inspector and the cognizant engineer conducted a walkdown of Building 2026 to observe the progress of the U-233 Disposition Project. Several campaigns are planned. The first will be the Oak Ridge Oxide Processing (OROP) campaign that will process U-233 in gloveboxes for thorium extraction and final disposition as low level waste (LLW). Second, the Initial Processing Campaign (IPC) will be conducted that will process U-233 in hot cells for final disposition as LLW. The contractor, Isotek Systems, LLC, has made significant progress on both the OROP campaign and IPC. For the OROP campaign, the contractor has installed gloveboxes and processing equipment, sampled to verify the lack of a perchlorate hazard near the safety significant (SS) ventilation system where glovebox exhausts were to be connected, and connected the glovebox exhausts to the SS ventilation system. In support of IPC, the contractor has cleaned up residual contamination in most of Cell Access Area 120 (behind the hot cells). That area was able to be down-posted to a radiological buffer area. In the near future, the contractor plans to install base plates for the hot cells, and sample the SS ventilation system for perchlorate hazards near where the hot cell exhausts will be connected.