

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 18, 2022

TO: Christopher J. Roscetti, Technical Director
FROM: Brandon Weathers, Resident Inspector
SUBJECT: Oak Ridge Activity Report for Week Ending March 18, 2022

Fire Protection: Based on an initial assessment of the failed transformer (see 3/11/22 report), CNS believes the fire was caused by a high impedance fault where a few of the transformer windings shorted. This created a fault current that was below the detection threshold of the overcurrent relays. In that condition, the transformer heated up until the insulation combusted and caused the nearby insulation between other windings to melt. The widespread failure of the insulation resulted in a hard fault and arc flash. CNS has an additional transformer onsite that can be used as a temporary replacement for the failed transformer. The failed transformer was one of three transformers that shared the electrical load in this portion of the Y-12 electrical distribution system. CNS plans to replace all three of the transformers.

The power loss due to responding to the transformer fire caused an unexpected situation at the Highly Enriched Uranium Materials Facility. The secondary confinement system activated (as expected) but three exhaust fans were running. The secondary confinement system would normally power two of the three exhaust fans. Facility management questioned whether the diesel generator would have enough fuel to power three exhaust fans for the technical safety requirements specified run time of the diesel generator. CNS evaluated this question and determined that the diesel generator would meet its required run time. CNS discussed this impact at the event critique meeting and created actions to track the corresponding evaluation.

Building 9212: On Saturday afternoon, a chilled water leak occurred on a supply fan ventilation system. The water flowed through a contamination area into a radiological buffer area and administrative/office areas. Radiological control and operations personnel responded to monitor and contain the leak. The radiological control personnel did not detect any spread of contamination. The water evaporated over the weekend. CNS created a work order to investigate the equipment to determine the failure point and repair the system.

Nuclear Criticality Safety: CNS filed an occurrence report for the non-conservative fissile mass assumption that they identified with the solidified salt bath sludge in Building 9215 (2/25/22 report). The reporting criterion was for not having adequate controls in place for a credible criticality accident scenario. CNS took additional non-destructive assay measurements of the material but was not able to get an accurate result. CNS is checking data from the nuclear material control and accountability database for some of the other items in the area.

Separately, CNS issued guidance to close an outstanding nuclear criticality safety deficiency from May 2021 regarding uranium nitride pellets mixed with oxide that were stored in the Highly Enriched Uranium Materials Facility (see 6/18/21 report). The uranium nitride pellets and oxide were not an approved loading for the storage container. CNS performed an additional analysis that will support the applicable criticality safety evaluation to classify these materials as an approved loading. Once this additional evaluation becomes effective, CNS can remove the administrative control on the affected containers.