

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 20, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: Frank Harshman and Clinton Jones, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for the Week Ending January 20, 2023

Criticality Safety: The resident inspectors and NPO criticality safety engineer conducted a walkdown of the Building 9212 casting wing. The resident inspectors observed CNS respond to two separate criticality safety issues during the walkdown. The first issue was rainwater intrusion that had pooled on the floor and flowed under casting line equipment. CNS responded by establishing a nuclear criticality safety (NCS) administrative boundary per the CNS procedure for an abnormal condition involving fissile material. CNS NCS personnel provided direction to collapse the administrative boundary once the extent of the wetting had been determined. CNS elected to maintain the operation out of service and allow the water to evaporate based on the rapid rate of evaporation due to the air flow through the location. The second issue involved casting stack assemblies that tipped over as they traveled along a conveyer belt inside the glovebox after they had been removed from the casting furnaces. The assemblies contacted a partially open glovebox gate at the exit of the East Casting Line Cooling Tunnel. One assembly completely tipped over and came to rest on its side. The second assembly in the line tipped over and came to rest leaning against the side of the glovebox. CNS operators were able to stop the conveyer belt in time to prevent the third assembly from being impacted. CNS established a NCS administrative boundary and consulted the criticality safety evaluation to verify that this was an analyzed upset condition. NCS personnel provided written guidance for operators to pick up the crucible and mold housing to re-assemble the casting stack assembly. Operators used the dry vacuum system to clean up material that had spilled when the components were knocked off the casting stack. Once CNS re-assembled the casting stack and cleaned up the material, the NCS administrative control was rescinded.

Building 9212: The resident inspectors attended an event investigation involving the monthly testing of the wet vacuum system trap isolation valves (see 12/30/22 report). The resident inspectors raised a question to CNS concerning pre-conditioning of the isolation valve. Unacceptable pre-conditioning is any activity performed prior to or during an in-service test which alters one or more of the measured parameters such that it results in acceptable test results. The surveillance test was written in a sequence such that the isolation valve was cycled prior to a timed closing test. Facility operations management was unfamiliar with the term pre-conditioning. The resident inspectors then raised the concern to the CNS system and process engineers and questioned why the procedure was sequenced in that order. The CNS engineering group's opinion was that since the isolation valve was cycled at least twice a month, the effects of cycling the valve prior to the timing test were negligible. The procedure included the timed closure test to gather data after a prior failure of a timed annual surveillance. The resident inspectors then brought the concern back to engineering management and inquired if CNS utilized industry operating experience when writing surveillance procedures for criticality safety or safety basis requirements. The resident inspectors provided insight that cycling of the isolation valve prior to a closure timing test was considered unacceptable pre-conditioning by the nuclear industry and shared the references with CNS. After discussions on the topic, CNS engineering management agreed to evaluate the way the surveillance was written for the timing test of the isolation valve.