

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 19, 2024

TO: Timothy J. Dwyer, Technical Director
FROM: Clinton Jones, Resident Inspector
SUBJECT: Oak Ridge Activity Report for Week Ending July 19, 2024

Building 9215: The RI attended an event investigation for a lathe that was operated beyond the scope of an initial test plan. During a recent Inadvertent Accumulation Prevention Program walk down of the material access area by CNS, a nuclear criticality safety officer (CSO) asked what nuclear criticality safety (NCS) document approved machine coolant use for a specific lathe. Due to not knowing the answer the team entered the abnormal operating procedure, *Abnormal Condition Involving Fissile Material*, established a 15-foot administrative boundary, and notified the shift manager. The shift manager later collapsed the boundary to the lathe with guidance from the NCS personnel on the walk down and the machine was posted with a NCS deficiency.

CNS production and test engineers created the original test plan for the lathe in May 2021, incorrectly categorizing it as a grade 4, or commercial grade, part although it was to be connected to fissile systems including the machine coolant system, chuck vacuum system, and contaminated ventilation system. The incorrect grading led the test plan to be reviewed with a lower level of scrutiny, circumventing the test review board process that would normally be followed for machinery to be connected to fissile systems. CNS considered the machine coolant system to be a radiologically contaminated system at that time, not understanding that it was a fissile bearing liquid that required specific NCS controls. The lead NCS engineer reviewed the test plan after it was written and determined that no criticality safety evaluation changes were required for site acceptance testing, but a criticality safety evaluation revision would be needed prior to enriched uranium machining.

At the start of testing the lathe in November 2021, the initial flow of coolant was black with sludge for a short period of time, then returned to its normal blue green color. The initial purge of sludge was due to the machine being connected downstream of a stagnant leg of the system. NCS personnel were present for the initial testing and flow of machine coolant through the lathe but did not recognize the purge of sludge as an abnormal condition. CNS completed the site acceptance test plan for the lathe in March 2022 but continued to use the lathe to machine stainless steel until November 2022, beyond the scope of what was authorized. The event investigation identified that this lathe and two others should be tagged as out of service and the coolant supply isolated for them until appropriate evaluations and reviews are complete.

Building 9204-2E: CNS continued testing of the new criticality accident alarm system this week. Facility operation management questioned the basis for the proposed 8-hour requirement for the newly installed uninterruptible power supply batteries due to there not being a current design analysis calculation on file. To validate the proposed assumptions, CNS tested the power draw of the credited annunciation horns that are powered by the system. During the test it was noted that portions of the system were not functioning as expected and the test was terminated. CNS plans to troubleshoot the issue and resume testing at a later date.