

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 20, 2025

TO: Technical Director
FROM: Oak Ridge Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending June 20, 2025

Building 9215: CNS entered the potential nuclear criticality safety issue (PNI) process for the machine coolant system (MCS). After working through cleaning of the coolant return troughs due to high non-destructive assay (NDA) readings for enriched uranium, CNS proceeded with sampling of the supply lines. The resident inspector has expressed concerns with the supply lines and the mobility of the sludge contained within them (see 2/7/2025 report). CNS previously did not have a means to address the mobility of this holdup, as evident during the initial startup of one of the newest lathes in the machining area (see 7/19/2024 report). CNS developed a plan to validate the amount of holdup in the MCS piping following the investigation and critique of that event. CNS established a cleanout plan based on addressing the highest risk portions of the system first. This started with the MCS return troughs where CNS discovered little holdup, contradicting the NDA measurements. Recently, as CNS moved on to the MCS piping, they removed a section of piping and sampled the content, which had high holdup readings. After reviewing the supply lines, CNS entered the PNI process and ultimately filed an occurrence report based on having a deficiency in a criticality safety analysis such that adequate controls were not in place for a credible criticality accident scenario. CNS plans on revising the criticality safety evaluation (CSE) to analyze the holdup material in the supply lines that migrates during initial startup activities and create a nuclear criticality safety control to bound the activity. Current compensatory measures include placing four machines out of service until the CSE can be revised with the above strategy. This is the third PNI generated on the MCS since January 2024 that is directly related to holdup in the system.

Building 9212: Chemical operators (COs) were unpacking legacy drums generated by New Brunswick National Laboratory over 40 years ago. The COs planned to process two drums, previously stored in Building 9204-2E, one after the other inside of an enclosure. The enclosure ventilation exhausts to the local area through a high-efficiency particulate air filter. COs opened, verified contents of, and repackaged the first drum without incident. COs opened the second drum and observed an orange/brownish vapor release from the container. A shift manager (SM) and criticality safety officer observing the operation outside of the enclosure smelled a chemical odor, and the SM immediately directed the evacuation of the area. The SM established an administrative boundary, placed a posting on the doors of the room containing the enclosure, and notified Industrial Hygiene (IH) and management personnel. Facility Operations Management convened an Operational Safety Board (OSB), comprised of subject matter experts, to determine the immediate response to the event. IH determined—through a review of the material contained in the drum and the visual descriptions of the chemical vapor—that the vapor was likely nitrogen dioxide. OSB authorized entry into the area to enable the completion of air sampling. When the atmospheric monitoring team entered the area, they encountered a worker who had failed to recognize the newly posted administrative boundary and unknowingly entered the area. The worker was immediately directed to leave by the atmospheric monitoring team. IH detected no gas in and around the enclosure; however, they obtained a reading of 1.4 ppm nitrogen dioxide from the drum itself. CNS conducted two separate event investigations: one for the off-gas event and one for the administrative boundary violation. CNS maintains drum processing on hold while evaluating the work controls.