

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 7, 2022

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending January 7, 2022

Building 9212: During a vital safety system annual review for the wet vacuum system, NPO personnel raised a concern about the position of a conductivity probe. The wet vacuum system transfers fissile solutions in various areas of Building 9212. The areas that connect to the wet vacuum system each have a final area trap. To prevent or limit flow of fissile solution to unfavorable geometry equipment, a conductivity probe is used to detect liquid in the final area trap and this probe is interlocked with an automatic isolation valve. The technical safety requirements require that the level-detection system close the isolation valve in 5 seconds. The criticality safety evaluation has a control that the conductivity probe is positioned 2 inches or less from the bottom of the trap. After investigating the final area trap that NPO questioned, CNS found that a second trap also had a probe that was greater than 2 inches from the bottom of the trap. CNS isolated those two traps and placed the entire wet vacuum system in warm standby mode. During the critique meeting, CNS discussed that one of the affected traps had been disassembled for cleaning in March 2021. The work package for reinstalling the trap did not require verification of the 2 inch offset. After the critique meeting, CNS realized that the criticality safety control for the probe position was a new control in the revised evaluation that became effective in July 2021, after the March maintenance activity. CNS is reconvening the critique meeting to update the timeline with the new information and evaluate potential additional actions. CNS issued a nuclear criticality safety deficiency as a result of violating this control.

Direct Chip Melt Project: NPO issued a safety review letter documenting the review and basis for approval of the safety design strategy for the direct chip melt bottom load furnaces project (see 5/17/2019 report). NPO had no conditions of approval. The DOE Chief of Defense Nuclear Safety (CDNS) also reviewed the project and provided an advice memorandum that stated the safety design strategy would be stronger if it referenced a gap analysis associated with the Extended Life Program regarding compliance with the DOE Order 420.1C requirement that processes involving fissionable materials remain subcritical under normal and credible abnormal conditions, including those initiated by design basis events (see 4/27/2020 report). Additionally, CDNS recommended that CNS note any anticipated exemptions that may be necessary. In the transmittal letter, NPO stated that they expect no exemptions to be necessary. The project startup date is forecast to be September 2026 per the startup notification report.

Building 9995: Last month, an analyst working in the analytical chemistry laboratory sensed a burning odor. Personnel initially thought that the odor may have been a rubber fan belt and secured two fans. Around that time, a chemist saw smoke coming out of a muffle furnace. Personnel notified the Y-12 fire department, and the shift manager began evacuating the first floor. The smoke was due to a chemist leaving a thermoplastic tray in the muffle furnace. One of the corrective actions that CNS developed for this event is to potentially modify the tray handle to preclude its placement in the muffle furnace or change the tray material.