

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 20, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: Clinton Jones, Resident Inspector
SUBJECT: Oak Ridge Activity Report for Week Ending October 20, 2023

Building 9204-2E: CNS filed an occurrence on October 16th due to a performance degradation of a safety significant system which prevents satisfactory performance of its design function when it is required to be operable. The operations center received an alarm from the non-credited monitoring system showing a speaker line circuit in the emergency notification system (ENS) was inoperable. Due to the ENS performing annunciation for the criticality accident alarm system (CAAS) in Building 9204-2E, the shift manager was notified of the potential issue. The shift manager requested that the operations center perform a verbal test count over the system to verify operability of the system in that area and confirmed it was inaudible. At that time, the shift manager entered the limiting condition for operation (LCO) as required for a partial loss of annunciation in the CAAS. Normally, the CAAS would have been considered operable since Building 9204-2E also has complete annunciation coverage by the CAAS horns, but the horns in the area were identified as inoperable during the previous annual surveillance test performed in October of 2022. CNS issued a maintenance package for the troubleshooting and repair of the defective horns at that time, but it was not worked due to prioritization. This week, to return the system to operable status, a maintenance package was issued on the ENS speakers. The failure was determined to be a dirty potentiometer. After cleaning of the suspect component, the shift manager verified operability of the affected speakers and exited the LCO. As a preventative measure, the operations manager escalated the maintenance package that had been issued to repair the defective horns in the annunciation area. In the resident inspector's opinion, while cleaning of a potentiometer will temporarily restore operability of the annunciation in the area, as cleaning, it is only a short-term fix. The longer-term solution is to bring the facility's new CAAS online. Installation, testing and troubleshooting of the new CAAS is ongoing.

Nuclear Criticality Safety: Last month, CNS evaluated the failures of two legacy CAAS detectors in Building 9206 and concluded that a potential inadequacy of the safety analysis (PISA) existed based on the limited information available at that time (see 9/15/2023 report). CNS reentered the PISA process after two additional legacy CAAS detectors in other buildings failed during the same approximate four-month period. After evaluating whether these failures challenged the safety bases for facilities where these detectors are credited controls, CNS concluded that a PISA did not exist. The reason for this negative determination was that all of the detector failures were covered under the facility technical safety requirements LCOs, and those actions placed CAAS detector failures in an analyzed and bounding condition. That being said, CNS did classify this issue as a condition adverse to quality and documented it as such in its contractor assurance system. Due to the level of severity, CNS plans to perform a causal analysis on the failures. The detectors that have failed were preliminarily determined to have failures in the photomultiplier tubes, although further analysis is ongoing. CNS entered other actions on the issue in the contractor assurance system, such as developing a white paper on implications from recent failures and performing a broad scope operability determination since similar legacy CAAS detectors are installed in other Y-12 nuclear facilities. The resident inspectors are following the actions CNS is performing on this issue.