

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 15, 2024

TO: Timothy J. Dwyer, Technical Director
FROM: Frank Harshman and Clinton Jones, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending November 15, 2024

Aging Infrastructure: CNS previously placed one of the two potable water towers out of service for planned system refurbishment (see 8/23/2024 report). On 11/6/2024, CNS placed the out of service potable water tower in service causing a pressure surge through the system. Later that day, a breach in a main water line occurred resulting in a significant loss of potable water pressure across the site. The potable water system supplies fire suppression systems at Y-12. CNS is unable to determine if the pressure surge is related to the rupture; however, the rupture occurred in 60-year-old cast iron pipe that has exceeded its design life. CNS previously identified these portions of the system as high risk and replacing these components is captured in a long-term replacement project.

Water supply pressures for fire suppression systems fell below the pressures required by the safety bases for Buildings 9204-2E, 9212, 9215, 9720-05, and 9720-82 because of the rupture. CNS filed an occurrence report for the degradation of a safety system and affected facilities entered appropriate limiting conditions for operation (LCO) and executed LCO actions within the required time. CNS isolated the rupture, restoring sitewide potable water system pressure late in the afternoon. Building 9215 remains in an LCO for three credited fire suppression systems as their water supply connections are within the boundary of required isolations. CNS performed required surveillances and declared all other systems operable after water pressure restoration. The affected Building 9215 fire suppression systems remains isolated and inoperable until the water main can be repaired, or a temporary water supply provided. CNS will continue to perform fire patrols for the inoperable systems until they are restored.

CNS responded to flooding from the water main breach on the first floor of Building 9204-2E and the basement of Building 9215. Water depth varied throughout the affected areas with levels of up to three inches. In Building 9204-02E, facility personnel executed the appropriate abnormal operating procedures for water intrusion into fissile material storage and processing areas. Building 9204-2E facility personnel performed additional actions to manage the water ingress to limit facility impacts. In Building 9215, flooding occurred in depleted uranium operations areas which are near many of the facility's power distribution systems. Facility operations management (FOM) delayed the start of LCO required fire patrols due to significant concerns of wetted electrical equipment and the large amount of standing water. The system engineer and electrical authority having jurisdiction evaluated the areas. They concluded that the areas are safe for fire patrol based on the water level not rising high enough to reach the bottom of the elevated electrical equipment. FOM cleared personnel to enter affected areas to start fire patrols within the required LCO action times. A resident inspector (RI) and Building 9215's operations manager walked down the affected areas of the building. The flow of water washed significant amounts of sediment into the building; however, most of the water had drained or evaporated by the time of the walkdown. The RI attended the event investigation for the FOM response to the event. CNS intends to continue the event investigation with infrastructure personal to fully address all aspects of the event.