

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 31, 2017

TO: Steven Stokes, Technical Director
FROM: Jennifer Meszaros and Rory Rauch, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending July 28, 2017

Fire Protection/Conduct of Operations: The Building 9215 shift manager recently reported a performance degradation of a safety-significant dry pipe fire suppression system. Fire protection operations (FPO) personnel isolated the system upon discovery of water discharging from its air relief valve. The leak occurred during an electrical outage that supported the demolition of electrical distribution system infrastructure for the 9215 Complex. CNS held a fact-finding meeting for the event and identified a failed check valve as the source of the issue.

While developing the timeline of events leading to the performance degradation, the fact-finding meeting attendees also identified unrelated conduct of operations weaknesses. Several weeks prior to the performance degradation, the system “wet up” during a separate electrical outage. Both Building 9215 operations management and FPO personnel anticipated the potential for this condition to occur as the outage required removal of power to the air compressor that maintains the system in a dry state. All parties understood that this condition would not affect operability of the system as defined in the technical safety requirements (TSR) because it would occur outside the freezing period. However, once the system wet up, FPO personnel did not communicate this change in status to the Building 9215 shift manager. Building 9215 operations management staff remained unaware that the system was in a wet state for nearly two weeks. FPO management plans to give a briefing to its staff regarding the need to notify operations management personnel of abnormal system conditions.

Special Nuclear Material Vehicle (SNMV): CNS engineering reported a potential inadequacy in the safety analysis (PISA) after determining that the SNMV safety analysis report (SAR) contained a non-conservative parameter. A CNS engineer identified the issue while reviewing the SAR in preparation for an annual update. The engineer questioned the appropriateness of the stoichiometric mass ratio (SMR) used to calculate the toxicological consequence of a uranium compound release to the co-located worker during a design basis fire. CNS engineers subsequently identified that the calculation did not consider the SMR of a different material produced during the fire event. They re-calculated the consequence of the event and found a slight increase for the compound in question; however, this consequence remained bounded by the consequence of a different hazardous material and did not require a change in controls. CNS engineers plan to resolve this issue in the annual update to the SNMV SAR.

Building 9215: CNS engineering is currently evaluating whether a recent failed annual surveillance in Building 9215 represents a PISA. The surveillance tests whether overflow drains, which are TSR passive design features installed on machine chip pans, adequately limit the depth of coolant that can accumulate in the pans. Last year, CNS reported a positive unreviewed safety question after personnel discovered throttled coolant valves that prevented six downstream chip pans from being tested at full coolant flow (see 9/2/16 report). In April 2017, as part of the justification for continued operation (JCO), machinists performed the surveillance for the six chip pans with the flow control valves fully opened. At that time, all but one of the pans passed the surveillance, including the pan that this week failed its annual surveillance. As such, CNS personnel released five machines from the controls identified in the JCO and are currently evaluating the best course of action for the machine and associated pan that failed the April surveillance. After the chip pan failed its annual surveillance this week, CNS personnel inspected the pan and the overflow drains but found no signs of degradation or plugging. They are currently considering whether a change in coolant flow caused the failed surveillance.