DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 16, 2020

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending October 16, 2020

Fire Protection: Over the next several years, Y-12 personnel plan to replace numerous fire and potable water laterals. Many of the fire water laterals supply fire suppression systems credited as safety class or safety significant in the safety basis documents for Buildings 9204-2E, 9212, and 9215. CNS prepared a safety basis supplement to allow for continued fire suppression coverage during these replacements by providing an alternate water supply that runs from hydrants to the fire department connection of the affected systems. CNS performed calculations to demonstrate that the alternate supply configurations can provide required minimum flows at pressures exceeding the required pressures. CNS preferred the alternate water supply option to establishing fire patrols. CNS developed compensatory actions that include installation instructions and alternate surveillance requirements. CNS intends to perform and complete the replacements outside of the freezing period (November 15 to March 31), but developed freeze protection actions in case they are needed. NPO issued a safety evaluation report to approve the safety basis supplement with no conditions of approval.

Nuclear Criticality Safety: CNS paused field work for the Building 9204-2E criticality accident alarm system (CAAS) replacement project in September. The project pause was primarily a result of needing to perform additional design work to establish shielding requirements for CAAS components. CNS plans to use data from upcoming radiation burst testing to confirm the shielding requirements. CNS also let the project scope and cost grow beyond the baseline project plan to the extent that current funding is inadequate to fund the remaining project scope. Prior to the pause, CNS had performed 78% of the conduit installations and 63% of the penetrations in 9204-2E. CNS recommended in 2015 that the Building 9204-2E CAAS be completely replaced since the facility is expected to operate beyond 2040.

Emergency Management: CNS issued the after action report for the emergency management exercise that was conducted on September 1 (see 9/4/20 report). CNS graded the performance as very good based on 119 of the 121 objectives being met. CNS noted one deficiency as a result of a personnel survey team making several errors. This was the second full-scale exercise in the DOE Complex since the COVID-19 pandemic began.

Electrorefining: Development personnel successfully produced two production-size pieces of uranium metal with the electrorefining production demonstration system. The development organization worked throughout the past year to install and demonstrate the electrorefining process using equipment that are duplicates of the electrorefining cell and furnaces that are planned to be used in the 9215 Complex. The demonstration system will also be used to train personnel in advance of readiness activities with the production system. NNSA expects that the electrorefining process will result in more reliable and cheaper production of purified uranium metal. The Electrorefining Project—along with the Calciner Project—could allow the Building 9212 Oxide Conversion Facility and reduction processes to be shut down, eliminate the use of extraction solvents, and greatly reduce the use of uranyl nitrate solutions.