

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 19, 2022

**TO:** Christopher J. Roscetti, Technical Director  
**FROM:** Frank Harshman and Clinton Jones, resident inspectors  
**SUBJECT:** Oak Ridge Activity Report for Week Ending August 19, 2022

**DNFSB Staff Activity:** A resident inspector attended portions of DOE's Safety, Infrastructure and Operations (NA-50) 2022 Master Asset Plan Deep Dive for the Y-12 National Security Complex.

**Building 9212:** During a metal reduction process run to convert uranium tetrafluoride (UF<sub>4</sub>) to uranium metal, the pressure inside of the pressure vessel climbed to approximately three times the expected process pressure. The vessel is rated at approximately 4 times the expected process pressure and incorporates a burst disc with a path that vents to a larger overflow tank. The Enriched Uranium Operations Director placed firing of the furnaces on hold pending an operability determination and investigation. The operability determination was performed at management discretion due to the unique nature of this event. The results of that operability determination confirmed the design features for safety of the pressure vessel were operable and not degraded. Both NPO and the resident inspectors reviewed the design analysis calculations (DAC) to verify the safety features and agreed that the system had not been compromised. CNS performed a detailed event investigation and critique of the operation to determine the cause of the anomaly. The data presented showed that out of the previous 350 runs of these furnaces, the firing pressures had not exceeded approximately double the expected process pressure. The operators performing the reduction were interviewed and the materials used in the batch were also reviewed. CNS performed a calibration on the pressure transducer and confirmed it was within specifications. Since the UF<sub>4</sub> material involved in this reduction run was part of a batch of material, the evaluation conducted by CNS will determine when and if they will proceed with firing the remaining UF<sub>4</sub> material. Although the pressure observed in the firing was within the pressure range assumed in the DAC, this was a statistically significant higher than average pressure observed during this process.

**Building 9212:** CNS completed processing a legacy waste drum which was received from Wood River Junction and is currently located in Building 9212. Wood River Junction was the site of a fatal nuclear criticality accident that occurred in 1964 at the United Nuclear Corporation Wood River Junction nuclear facility. When the facility was closed, items from the facility were loaded into drums and shipped to Y-12 for disposition. Y-12 received this drum in 1972. The drum contained various miscellaneous materials that contained radiological and asbestos hazards thereby complicated the disposition of the drum contents. It, along with a number of other legacy drums located in 9212, were dispositioned as part of a CNS campaign to process legacy material.

**Aging Infrastructure:** The Y-12 analytical laboratory (Building 9995) has been challenged with a number of temperature and humidity issues as a result of material deficiency in its chill water system (see 7/1/2022 report). CNS recently completed maintenance on the chill water system that improved conditions in Lab 40 and the Isotopic Laboratory, allowing those areas to resume operations.