

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 6, 2023

**TO:** Katherine R. Herrera, Acting Technical Director  
**FROM:** Frank Harshman and Clinton Jones, Resident Inspectors  
**SUBJECT:** Oak Ridge Activity Report for the Week Ending January 6, 2023

**Building 2026:** Isotek is recovering from two issues caused by a recent storm (see 12/30/2022 report). Strong winds toppled a large tree, which snapped two utility poles and knocked down their associated power lines. This caused Building 2026 to lose its normal power supply and the standby diesel generator to start. Building 2026 has two safety significant confinement ventilation systems (CVS). The CVSs are credited to mitigate radiological doses to the facility worker during fires initiated within the hot cells by maintaining differential pressure between the hot cell bank and adjacent occupied areas. During power transitions to the diesel generator, a momentary loss of differential pressure is expected. This will result in a locked in visual and audible alarm. Isotek personnel were able to enter the building after safety concerns over the downed powerlines were addressed. The workers saw that one of the CVS indicating panels had both the locked in visual and audible alarms as expected but they only observed the visual alarm on the second CVS panel. Due to the absence of the audible alarm, Isotek entered a limiting condition for operation (LCO) and filed an occurrence report for the degradation of a safety significant system. Operators subsequently verified that the differential pressure on the systems was above the minimum required by the LCO. Isotek also determined that the lack of an audible alarm was caused by the failure of the alarm buzzer. They later replaced this alarm buzzer. Isotek was able to exit the LCO after they satisfactorily completed all the required surveillances. Building 2026 was on diesel generator power for seven days.

The storm's prolonged freezing temperatures also ruptured part of the fire suppression system piping that was located outside of the process area. Isotek isolated the system to stop the flow of water and instituted fire patrols throughout the building. Isotek subsequently installed temporary isolations in the system to separate the damaged piping from the remainder of the system. This enabled the restoration of the fire suppression system in the process areas of the building while repairs of the damaged piping are being undertaken.

**Building 9212:** CNS held the event investigation for the second pressure anomaly that occurred during metal reduction (see 10/7/22 report). CNS investigated the batch constituents of the most recent anomaly and process parameters that were present in both reactor vessels when the two pressure anomalies occurred. The only common factors were the peak pressures and the poor quality metal that was produced by the anomalous batches. Because CNS suspected that the anomalies might have been caused by the presence of oxidation in the calcium, CNS performed detailed x-ray diffraction (XRD) tests on calcium samples that were taken from a container whose lid appeared to be inadequately crimped. This inadequate crimp was suspected to cause an incomplete seal, allowing the argon to escape and air to enter. CNS plans to revise the load procedure for the reactor vessels to address the issue of bad crimping on the calcium containers and develop an operator aide to help identify inadequate crimps. The revision will direct the removal and disposition of the top quarter of calcium in any container with a suspected bad crimp. Prior to resuming reduction operations, CNS will also revise the operating procedures to include contacting production senior management if the statistical control limits are exceeded.