DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 27, 2025

TO: Technical Director
FROM: Hanford Site Resident Inspectors
SUBJECT: Hanford Activity Report for the Week Ending June 27, 2025

DNFSB Staff Activity: A headquarters staff team was onsite to observe a meeting of the Tank and Pipeline Integrity Program Tank Integrity Expert Panel. Additionally, a headquarters staff emergency preparedness subject matter expert was onsite to observe the annual site-evaluated field exercise.

Hanford Site: Resident inspectors and a headquarters staff member observed the site emergency preparedness team conduct their annual evaluated field exercise and post-exercise hotwash activities. The scenario simulated a commercial cargo aircraft crash into B Tank Farm, resulting in a ruptured single-shell tank and multiple fires. The Hanford Site Emergency Operations Center (EOC) was activated. A simulated injured individual was transported to a local hospital and a simulated deceased individual was transported by the coroner to exercise the Hanford Site's external support options. EOC coordination, communications, dose assessment, unmanned aircraft system operations, and plume tracking capabilities were also evaluated.

Low-Activity Waste (LAW) Facility: LAW Facility management determined that an unreviewed safety question (USQ) exists after liquid was discovered in the carbon bed vessel while facility personnel were investigating and evaluating conditions following a carbon bed reaction event that occurred in late May. The liquid was identified as resulting from condensation during operations with nitrated feed. Upon draining the liquid, facility personnel performed a pH test and found it to be acidic. Further analysis determined that the liquid composition consisted primarily of nitric, nitrous, and sulfuric acids. The presence of acids in the system could result in a failure of the carbon bed vessel and other components in the off-gas system. Acidic condensation could also strip sulfates from or physically damage the carbon bed media, potentially leading to premature breakthrough of the lead bed, which could invalidate safety basis assumptions associated with mercury accumulation and distribution in the media. The USQ evaluation determined that these conditions could increase the likelihood and consequences of existing analyzed accidents and introduce the possibility of new, unanalyzed accidents. Facility management has restricted the introduction of feed containing mercury into the facility and is monitoring liquid level in the carbon beds. Facility personnel will drain any liquids that might collect if the carbon bed is isolated. WTCC nuclear safety personnel are evaluating the situation. Restrictions will remain in place until HFO approves any necessary changes to the safety basis and allows their removal. The resident inspectors met with WTCC engineering and nuclear safety managers and experts to understand ongoing actions to resolve the safety issue. WTCC engineering staff is performing a study to better understand the potential consequences of increased corrosion rates on off-gas system components. The engineers do not consider the potential for increased corrosion rates an immediate problem but are concerned that it will reduce the life of system components. Additionally, WTCC personnel are sampling the carbon media and measuring component thicknesses to establish a baseline for monitoring corrosion rates and system performance. Lastly, they are working to revise operational procedures to minimize condensation in the carbon bed.