DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 8, 2025

TO: Technical Director
FROM: Hanford Site Resident Inspectors
SUBJECT: Hanford Activity Report for the Week Ending August 8, 2025

Low-Activity Waste (LAW) Facility: WTCC management approved an Evaluation of the Safety of the Situation (ESS) that addresses an Unreviewed Safety Question (USQ) related to the discovery of acidic condensate in the LAW Facility off-gas system carbon bed (see 6/27/2025 report). The evaluation determined that additional work is necessary to understand the effects of the acidic condensate on the carbon bed media and how those effects may change the distribution of mercury, which is removed from the melter off-gas, within the bed. The mercury distribution is a key assumption in a safety basis calculation that supports an existing specific administrative control that protects the off-site public if a mercury release occurs because of a carbon bed media fire. However, the evaluation further determined that mercury-bearing waste treatment operations can be justified if the carbon bed media is exposed to mercury-containing off-gas for no longer than three years without replacement. Implementation of this restriction would allow the facility to enter hot operations while engineering performs the necessary analysis. WTCC will provide the ESS to the safety basis approval authority and receive approval prior to lifting the current compensatory measure, which precludes introduction of mercury bearing waste.

The LAW Facility held an emergency preparedness drill simulating a significant ammonia leak. The resident inspector noted that radio communications still have reliability issues, as noted during the DOE Operational Readiness Review.

Tank Side Cesium Removal (TSCR) Process: An H2C plant review committee determined that the Potential Inadequacy of the Safety Analysis (PISA) for the calculation error in the passive ventilation flow rate for spent Ion Exchange Columns (IXC) represents a USQ (see 7/25/2025 report). While the total change in hydrogen accumulation did not impact the credited safety significant controls, the safety basis incorrectly postulated hydrogen deflagrations and detonations as “unlikely” and “extremely unlikely”, respectively. However, the calculation noted conditions that exceed the lower flammability limits occur approximately eight times a year. As a result, the frequency of these events should be revised to “anticipated”. An extent-of-condition-review of this calculation error also identified an error in the assumptions about hydrogen buildup within an IXC after they are blown down, ventilated with sweep air, and disconnected from the TSCR enclosure but before they are fitted with vent stacks for passive airflow. This error overestimated the amount of time work could be performed around the IXC without ignition controls. As a result, the PRC determined a second PISA exists. IXC disconnect activities will be performed under ignition controls pending a USQ determination.

Tank Farms: An unplanned Limiting Condition for Operation entry occurred when a worker unplugged a cord providing alternate power to a safety instrument. The resident inspector noted that transfers between primary and alternate power supplies are not controlled by operations procedures, which increases the likelihood of inadequate control of system and equipment status.