DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 27, 2024

TO: R. T. Davis, Acting Technical Director
FROM: B. Caleca, P. Fox, and P. Meyer, Resident Inspectors
SUBJECT: Hanford Activity Report for the Week Ending December 27, 2024

Low-Activity Waste (LAW) Facility: In order to control emission of nitrogen oxides, anhydrous ammonia is used by LAW in the treatment of melter offgas. Five thousand gallons of ammonia will be stored near the LAW facility and represents a significant hazard to facility and collocated workers. As a result, the facility has implemented several chemical safety controls and emergency response procedures that assume a full inventory of ammonia is onsite. Prior to loading the ammonia storage tanks, a subcontractor and WTCC personnel performed pressure testing with ammonia vapor to identify any components that required repair or replacement. While most of the ammonia system was successfully tested, the work could not be completed, leaving a relatively small quantity of ammonia vapor under pressure in the parts of the ammonia system that passed pressure testing while WTCC waits for the next opportunity to bring the subcontractor back onsite. After ammonia odors were reported by Building 23 several days later, the area was restricted, and an industrial hygiene technician (IHT) was directed to take readings. The IHT identified an active leak from a valve flange. Direct readings showed concentrations of ammonia that exceeded the emergency action level (EAL) criteria for an alert-level event. The shift manager assumed his role as Building Emergency Director and declared an alert. The Emergency Operations Center (EOC) was activated, and site personnel responded to the event according to their procedures. Hanford Fire Department personnel, in consultation with WTCC personnel, successfully isolated the leak and established a larger isolation boundary pending a reentry to Building 23. The alert was then terminated with no personnel exposures and negligible release to the environment. Two resident inspectors observed EOC response and attended the emergency response organization hot wash and event fact finding. Participants were self-critical and noted several areas for improvement in contacting employees and expectations for personnel in transit to the 200 East Area that had already passed the Wye Barricade used to control site access. WTCC personnel identified that the leaking flange had passed pressure testing but could not yet determine the cause of the failure. A reentry confirmed that there was no active leaking of ammonia, and the isolation boundary was reduced. Troubleshooting, repairs, and testing of the failed flange will be performed when the subcontractor returns to complete testing of the remainder of the ammonia system.

Radiochemical Processing Laboratory (RPL), Pacific Northwest Site Office: RPL relies on an inventory tracking system to ensure in-process radioactive material quantities do not exceed the facility limit to protect safety basis assumptions and inform decisions about material intake and storage at RPL. Facility personnel discovered high levels of contamination on a sample of radiological material being prepared for disposal. A paper review determined this was one of four samples generated in 2008 that were believed to all be disposed as radiological waste prior to the implementation of the current inventory tracking system. Facility management is working to identify the chain of custody of the four samples to verify their location, and access to the affected lab room was restricted. The facility limit was not exceeded because of this event. This is the fourth notable occurrence at RPL related to inventory control within the last 15 months (see 10/27/2023, 2/9/2024, and 12/13/2024 reports).