

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 26, 2023

TO: Katherine Herrera, Acting Technical Director
FROM: B. Caleca, P. Fox, N. Huntington, and P. Meyer, Resident Inspectors
SUBJECT: Hanford Activity Report for the Week Ending May 26, 2023

Hanford Site: A resident inspector observed the 24/7 Production Operations Summit hosted by DOE Hanford management. The purpose of the meeting was to discuss the progress of the prime contractors and DOE toward an operational culture that supports Direct Feed Low Activity Waste (DFLAW) operations. Participants discussed their organization's progress made in support of DOE Hanford's phase gate process (see 2/9/2021 and 12/17/2021 reports). DOE Hanford's expectation is that DFLAW operations schedule will dictate when other facilities and infrastructure are available. The resident inspector noted common concerns among contractor leadership such as aging infrastructure, maintaining adequate skilled staff, and increasing integration between contractors to reduce miscommunication and unplanned outages.

REDOX Facility: A resident inspector observed a question-and-answer session held by the Hazard Review Board (HRB) on a fissile material sampling work package. The package was suspended after workers detected unexpected levels of nitrous oxides and flammable gas while installing a hot tap to a process line. The new package incorporates 1) additional engineered controls to ventilate the hot tap locations and 2) improvements to criticality safety controls added based on previous discussions between the resident inspector and project personnel. The resident inspector notes that the latest package revision and HRB feedback represent significant improvements in identifying and controlling hazards. Further, senior CPCCo management was in attendance as part of the contractor's recent efforts to improve work planning and execution.

Tank Side Cesium Removal (TSCR): The Plant Review Committee (PRC) met to discuss two issues related to TSCR hydrogen control. Sweep air is used to dilute hydrogen generated in the headspace of a TSCR ion-exchange column (IXC) to prevent hydrogen deflagrations in the process enclosure. The first issue is associated with the time to the lower flammability limit (LFL) and the flow rate of the sweep air. The calculation used to predict the time to LFL assumed a higher flowrate than the value required by the limiting conditions for operation. If utilizing the lower flow rate, the time to LFL will be shorter, reducing the margin of safety. The second issue is associated with the frequency of evaluated flammable gas events in the TSCR safety basis. A frequency of unlikely is assigned for accidents occurring while a worker is present in the enclosure. However, the safety basis documents do not discuss the situation where a worker intentionally breaches the system (e.g., work on an IXC Chemjoint™ fittings), and a deflagration or detonation occurs. The frequency of this event may be anticipated. Because of this new information, the PRC determined that a potential inadequacy in the safety analysis exists. An unreviewed safety question determination will be performed next week.

Tank Farms: The PRC met and determined that the new information related to damaged transfer line insulation represents an unreviewed safety question (see 5/19/2023 report). Restrictions are in place on potentially impacted transfer lines.