

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 1, 2022

TO: Christopher J. Roscetti, Technical Director
FROM: B. Caleca, P. Fox, and P. Meyer, Hanford Resident Inspectors
SUBJECT: Hanford Activity Report for the Week Ending April 1, 2022

DNFSB Staff Activities: A Board's technical staff review team met with Tank Farms Operations Contractor (TOC) representatives for a follow-up discussion regarding TOC actions after the discovery of damaged safety-significant threaded couplings on Tank Side Cesium Removal (TSCR) system Ion Exchange Columns (IXC) and associated process hoses (see 3/4/2022 report). TOC operations and maintenance personnel have completed the first TSCR batch run and have placed two spent IXCs on the outdoor IXC storage pad. At this point, the IXC coupling safety function becomes important. The discussion focused on actions that the TOC could implement to (1) bound unknown conditions resulting from the thread damage, (2) prevent conditions that might further reduce the strength of the coupled connection and jeopardize their safety function over the 50-year design life, and (3) obtain a quantitative verification that would ensure a coupling is fully engaged to support compliance with the associated technical safety requirement (TSR). The TOC representatives stated that it is not feasible to obtain additional information on post-repair thread condition. Additionally, they have performed testing to support their evaluation that the damaged, yet fully engaged, couplings retain adequate strength to perform their safety function. Further, they stated that, despite the potential for cracks or localized stress concentrations caused by the damage, there is little risk of pitting or crevice corrosion in the couplings because of the type of material used, the low service temperatures, and lack of chloride sources. However, they have asked the Tank Integrity Expert Panel to provide a second opinion on their position; they have also added instructions in work procedures to ensure the connections are cleaned prior to assembly so that contaminants that might cause corrosion are removed. Lastly, they stated that, after consulting with the coupling vendor, there is no need for quantitative verification of thread engagement to ensure threaded couplings are correctly assembled. Instead, they will continue to rely on "skill of the craft" for compliant completion of the associated (TSR). However, they stated that they would research methods for repair of the thread lubricant coating, if it is found to be damaged during the pre-assembly inspection, to ensure torque values (if obtained) are valid. DOE representatives at the meeting did not provide any feedback or position on the discussion topics.

Waste Treatment Plant (WTP): WTP test and operations personnel transferred six thousand gallons of liquid from the Effluent Management Facility to Liquid Effluent Retention Facility (LERF) Basin 42. This was the first transfer of liquid between the two facilities using the recently completed, mile long, transfer lines. The LERF Facility is operated by the TOC.

The ORP Senior Review Board (SRB) met to evaluate the latest revision of the High-Level Waste Facility Preliminary Documented Safety Analysis (PDSA). Major changes include risk acceptance for facility wide events including post-volcanic ashfall hydrogen explosions and aircraft crashes, changes to consequence calculations due to redesign of the radioactive liquid waste disposal system, and resolution of a previous condition of approval by providing a basis for the use of administrative controls in lieu of engineered controls for certain accidents. The SRB recommended approval of the PDSA. However, because the changes to the aircraft crash analysis increase the consequences to the collocated worker and no new controls were identified, the SRB will receive a briefing and hold a follow-on discussion to discuss how the PDSA approach for the aircraft crash event compares to other DOE facilities.