

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 8, 2023

TO: Timothy J. Dwyer, Acting Technical Director
FROM: B. Caleca, P. Fox, N. Huntington, and P. Meyer, Resident Inspectors
SUBJECT: Hanford Activity Report for the Week Ending September 8, 2023

Tank Side Cesium Removal (TSCR): Workers encountered higher than expected beta dose rates when they removed a cap from a TSCR process sweep airline to connect it to a new ion exchange column. The dose rates were above a safe condition level specified in the associated radiological work permit. Consequently, the crew placed their worksite in a safe condition and exited the process enclosure. Management held an in-process ALARA review to discuss the conditions found. A smear taken at the inside edge of the connection found high energy beta contamination, and material inside the connection and further into the pipe had a high enough dose rate to pose an extremity dose hazard at the end of the assembly while uncapped. Work instructions were revised to account for the hazard.

Building 324: Following an entry into the Radiological Engineering Complex hot cell airlock to troubleshoot issues with the A Cell crane, a worker alarmed a personal contamination monitor. Radiological control technicians were able to identify the source and decontaminated them successfully. This is the first skin contamination event since radiological work was paused after a series of personal contamination events at the facility (see 11/19/2019 report). A resident inspector observed a critique held after the event and noted that participants were forthcoming with their observations and concerns. Two workers in the airlock had contaminated oil on their outer set of anti-contamination clothing, which was not successfully wiped off prior to doffing. In addition, the contaminated worker had sweated considerably, which could transport contaminants through his anti-contamination clothing. While no direct cause could be readily determined, the work had been delayed and then extended to add a new scope of work that had not been briefed that morning. Based on the critique meeting, facility management has paused airlock entries pending further evaluation by contractor performance assurance.

Tank Farms: A resident inspector reviewed the results of the Process Hazards Analysis (PrHA) for use of the Tank Dome Core Cutter System (TDCCS) at single-shell tank A-106 (see 7/28/2023 report). Specifically, the resident inspector followed up on their questions concerning the drop of the dome core and cutting equipment into the tank dome and impacting dry waste at the bottom of the tank, resulting in an airborne release. The PrHA report did not consider this specific scenario but did address related scenarios that the contractor considered were bounded by a tank dome failure due to excessive load, which is an analyzed scenario in the Tank Farms Documented Safety Analysis. In reviewing this bounding scenario, the resident inspector noted that a key assumption in the analysis was that 90 percent of the particulates lofted by the impact were scavenged by falling soil, reducing the dose to an exposed individual by a factor of ten. Since the TDCCS installs drill casings in the soil prior to cutting the dome, this assumption would not apply. However, project personnel believe that even without the dose-reduction effect of scavenging, the result from the tank dome failure accident would still be bounding given the very large amount of falling mass involved in the scenario. Project personnel agreed to make changes to the PrHA report to clarify the applicability of the bounding scenario and document their technical justification.