

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 28, 2023

**TO:** Christopher J. Roscetti, Technical Director  
**FROM:** B. Caleca, P. Fox, N. Huntington, and P. Meyer, Resident Inspectors  
**SUBJECT:** Hanford Activity Report for the Week Ending April 28, 2023

**Staff Activity:** B. Caleca, P. Fox, N. Huntington, and P. Meyer were in Washington, D.C., to brief the Board.

**Advanced Modular Pretreatment System (AMPS) Project:** DOE intends to expand its cesium removal capability by installing AMPS. The expansion is necessary to provide adequate feed to allow full capacity operation of the Low-Activity Waste Facility in the direct feed mode. AMPS will use the same technology currently used by the Tank Side Cesium Removal System (TSCR). The system will be installed at AP Tank Farm near the current TSCR system under a sub-contract managed by the Tank Farm Operations Contractor. DOE has concurred with the contractor's determination that the extent of physical structure and process systems that will be installed under the project represent a major modification to the Tank Farm safety basis per the criteria of DOE-STD-1189-2016, *Integration of Safety into the Design Process*.

**Waste Treatment Plant (WTP):** The Safety Basis Approval Authority approved revision 11 of the High-Level Waste Facility preliminary documented safety analysis (see 3/17/2023 report).

The Low-Activity Waste Facility Plant Management Review Board (PMRB), which evaluates changes to the chemical safety management program and its related controls, met to evaluate a design change to the melter power supplies. The change installs a vendor recommended and supplied smoke detector within one of the power supply panels for each melter. The hazard control is necessary because the power supply vendor has determined that hydrogen gas could collect within the panel during some off-normal conditions. Although there have been no actual occurrences of this failure mechanism, it could result in an explosion hazard, if it did occur. The smoke detector would detect the conditions and interrupt the input power to the melter power supply before the conditions could produce enough hydrogen to exceed the lower flammability limit. During their discussion, members of the PMRB introduced unvalidated assumptions regarding the likelihood of the event, the availability of ventilation, and the size of the explosion. These assumptions were not substantially questioned by other PMRB members and appeared to factor into their decision to approve the change. Additionally, the smoke detector will be general service instead of safety-significant. This decision appears to have been reached by the BNI/WTCC based on a determination that the hydrogen explosion is a standard industrial hazard even though it could result in the death or serious injury of any worker located near the panel if it occurred. Instead, facility management will rely on work and room access controls to reduce the probability of a serious accident. This decision does not appear to be consistent with current guidance regarding evaluation and control of hazards within DOE defense nuclear facilities. However, the related nuclear safety evaluation determined that the change did not represent a potential inadequacy of the safety basis. The resident inspector met with DOE representatives, who had also attended the meeting and had raised questions regarding the contractor's approach, to discuss his concerns. The DOE representatives noted that they had similar, as well as some additional concerns, and are following up to address them with the contractor.