DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 1, 2024

TO: Timothy J. Dwyer, Technical Director
FROM: Mark T. Wright, Cognizant Engineer
SUBJECT: Idaho National Laboratory (INL) Report for October 2024

DNFSB Staff Activity. The Board's INL cognizant engineer held weekly meetings to maintain awareness of site activities, including attending event fact findings, management reviews, integrated project team reviews, and facility plan of the day meetings.

Update on Advanced Mixed Waste Treatment Facility (AMWTP) North Boxline Drum Event. The Cognizant Engineer's September 2024 report described an event that occurred in the AMWTP north boxline, where a brief flame was observed emanating from a corrosion breach on the bottom of a BN510 product drum containing four super-compacted waste drums ("pucks"). After the event, AMWTP personnel opened the BN510 product drum in the boxline to observe the condition of the puck drums and the interior of the product drum. AMWTP personnel subsequently developed an engineering report detailing these conditions, contents of the product drum, and the potential for a pyrophoric reaction to be the cause of the event. Three of the pucks contained solid material from various waste streams, while the fourth puck drum contained material and probable prior liquids from the cleanout of the super-compactor glovebox. The cleanout puck drum was severely corroded, while the other puck drums were free from significant corrosion, however no remaining liquid was found. Based on the observed condition of the product and puck drums compared to previous pyrophoric events, the report concluded that pyrophoricity was not the likely cause of the observed flame and the corrosion was likely the result of free liquids in the cleanout puck drum. The report cites volatile gases as the source of the flames but does not elaborate on the generation of these gases, which were observed to be present but below flammable limits when personnel sampled the product drum several years ago. In October 2024, AMWTP sampled about 10 of 200 other product drums with cleanout pucks and did not observe volatile gases above the lower flammable limit. AMWTP personnel resumed processing of this waste under a new long-term order that requires drums with cleanout pucks be treated as "suspected high flammable gas," which further requires installation of bands on the drum lids prior to movement, and banding lids of any overpacks in which these drums are placed.

New Waste Calcine Facility (NWCF) Crane Repair Update. As noted in the June 2024 report, the NWCF valve cubicle crane wire rope was damaged while attempting to recover from a crane fault during filter work. NWCF personnel have completed the investigation and repaired the crane. The investigation revealed legacy incorrect wiring in the crane pulpits. Once the wiring was corrected to the original vendor and INL drawings, the crane operated as expected. NWCF personnel originally anticipated updates to the crane drawings and procedures, but these changes became unnecessary after the issue was identified and corrected.

Integrated Waste Treatment Unit Waste (IWTU) Processing Update. During the last weeks of October 2024, IWTU processed waste at feed rates varying between 1.0–1.5 gpm based on process parameters. IWTU personnel reduced the waste feed rate and implemented other minor process control changes in response to several increases in differential temperature across the Denitration Mineralization Reformer (DMR). Following minor adjustments, the DMR differential temperature decreased back to the normal operating range. These temperature excursions are significantly less than those observed during the summer of 2023 (See June–August 2023 reports). IWTU personnel continue to monitor key process parameters closely and make adjustments accordingly.