

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 5, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Timothy L. Hunt, Cognizant Engineer
SUBJECT: Idaho National Laboratory (INL) Report for June 2019

DNFSB Staff Activity. Board's staff members conducted two person-weeks of on-site activities during June 2019. The Board's staff has provided an average of 1.11 person-weeks per month of on-site oversight for the first nine months of fiscal year 2019.

Integrated Waste Treatment Unit (IWTU) Outage Status. Following process cooldown after the third demonstration run and transition to shutdown mode, the IWTU entered Outage J on June 12, 2019. The outage will allow plant personnel to perform inspections, maintenance, and system modifications. Two issues were encountered during modifications to major equipment. One of the issues occurred when five of the 18 process gas filter (PGF) bundles could not initially be removed from the filter vessel due to broken filter elements creating interferences; the bundles have since been removed by pushing elements back into place to realign them. To prevent unwanted material releases from breached filter elements, each element has a 6 inch "fuse" (a smaller filter element within the larger, primary element) at the top of the element where the gas exits the filter. The fuse is designed to plug the breached element, increase the pressure differential across the element, and force a system shutdown. This will inhibit carbon dust from escaping the PGF head and being passed downstream. The other issue arose when the denitration mineralization reformer (DMR) downcomers—which reduce velocity of off-gas destined for the PGF so fluidized bed particulates fall out and return to the bed—were pulled for inspection and one was found to be caked in carbonate, compromising its effectiveness. A Fluor Idaho technical review group is evaluating options, including adjusting the chemistry or flow in the DMR, to minimize carbonate residue buildup on the downcomers. The downcomers are sized for a flow rate of 2.5 gals/min, but the system was operating at 1.6 gals/min, or less, during the third simulant run. This slow rate is thought to be contributing to the caking.

Status of Accelerated Retrieval Project (ARP) Facilities. Processing of the final three waste trays in ARP V was suspended when they were found to be outside the allowable temperature range during thermal monitoring. This has precipitated changes to the thermal scan process and limits for determining an exothermic reaction. Heretofore, the waste surface temperature was compared against the ambient air temperature obtained from an analog thermometer in the Retrieval Area. An engineering analysis recommended a process change to use the infrared camera to capture the ambient surface temperature of a tray of material similar in physical properties to the waste (i.e., Oil-Dri®). In addition, the analysis determined that a broader temperature range of 6.3 F between ambient and the waste is justified (previously 3.6 F).

High winds in late-June are suspected of causing an approximately 3 foot tear in the outer fabric membrane layer of the ARP II facility. ARP II is currently being used to process waste retrieved in ARP IX. Operations personnel confirmed that the inner membrane is in place with no damage and building airflow remains within specification. Radiological surveys have been negative and additional air monitoring is being performed as a precaution. Tears have occurred in ARP facility membranes before and are normally repaired using a fabric weld process (i.e., heat and glue).