

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 1, 2016

TO: Steven Stokes, Technical Director
FROM: Bradford Sharpless, Idaho Cleanup Project Cognizant Engineer
SUBJECT: Idaho National Laboratory (INL) Report for December 2015

DNFSB Staff Activity: Board's staff member R. Quirk was on site during December 1 – 4, to observe waste simulant processing operations at INL's Integrated Waste Treatment Unit (IWTU). The Board's staff provided an average of 1.7 man-weeks of on-site oversight per month for the first three months of fiscal year 2016.

Integrated Waste Treatment Unit: On December 13, managers at the Integrated Waste Treatment Unit (IWTU) made the decision to discontinue waste simulant testing and commence a shutdown of the facility's processing systems. The primary reason for the shutdown was a high differential temperature measurement between temperature sensors in the Denitration Mineralization Reformer (DMR) vessel. Operators were unable to correct this differential temperature by adjusting the solid and fluid inputs to the DMR.

Upon completing a cool down of IWTU's processing systems, engineers were able to inspect the DMR's interior. They found the presence of "tree bark" mineral scale on the DMR's walls and in its bed material, though in significantly reduced quantities compared to that found following a previous round of simulant testing. They also noted erosion around some of the fluidizing gas rail nozzles and rock-like particles blocking some of the auger grinder's screen holes. Following the current maintenance outage, in which IWTU's engineers will attempt to resolve these and related issues, IWTU will resume waste simulant testing.

Idaho Nuclear Technology and Engineering Center: On November 30, the Nuclear Facility Manager (NFM) at the Idaho Nuclear Technology and Engineering Center's CPP-666 Fuel Storage Area (FSA) received notice that workers at the Materials and Fuels Complex (MFC) opened a storage bottle of Experimental Breeder Reactor-II (EBR-II) fuel pins and found that the bottle contained 22 fuel pins rather than the expected 11. The bottle had recently been shipped to MFC in a cask with seven other bottles from FSA. Of the other seven bottles in the shipment, six were found to contain the exact number of fuel pins indicated on the fuel receipt documentation, while one container was empty. The bottles containing the EBR-II fuel pins were originally loaded in 1979. FSA currently holds approximately 3300 bottles of EBR-II fuel pins in underwater storage in the facility's Pool #2.

Upon receiving notification of the discrepancy regarding the number of EBR-II fuel pins in the storage bottles, FSA's NFM stopped all movement of fuel in and out of Pool #2 pending the issue's resolution. As the criticality safety evaluations cited in the FSA's safety basis assume a maximum of 12 fuel pins per bottle, the NFM subsequently declared a Potential Inadequacy in the Safety Analysis (PISA). This PISA led to a positive Unreviewed Safety Question Determination on December 9. FSA's management and operating contractor will develop an Evaluation of the Safety of the Situation to determine what, if any, additional controls are required for storage, handling, and cask loading of EBR-II fuel bottles.