

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 9, 2018

TO: C. Roscetti, Technical Director
FROM: D. Shrestha and L. Lin, Acting Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending August 10, 2018

9212 East Line Casting Hydraulic Fluid Leaks: On August 2, 2018, production personnel noticed hydraulic fluid leaking from a controller fitting on the wall inside of furnace zone F; no hydraulic fluid was found inside the furnace F bowl. The mass of fissile materials in the furnace F bowl or the furnace zone F did not approach the applicable limits. Production personnel and the system engineer isolated the controller by closing the appropriate valves. On August 7, 2018, production personnel noticed a small hydraulic fluid leak (approximately 50 milliliters) in the furnace C bowl. The production personnel were unable to identify the source of the leak location. The mass of the fissile materials in the furnace C bowl or furnace zone C did not approach the applicable limits.

The leaks violated the criticality safety evaluation (CSE) requirement that the “Hydraulic lines (hoses, piping, fittings, etc.) inside the casting line enclosures shall be designed to at least 1.5 times the maximum system pressure to prevent a hydraulic fluid leak.” Three leaks have occurred in the east line casting since July 18, 2018 (see 8/3/18 report).

Building 9720-5 Potential Inadequacy of the Safety Analysis (PISA): Building 9720-5 personnel discovered enriched uranium in the tube vaults in the forms of chips, turnings, and fines. The Hazard Evaluation Study (HES) assumes that no chips or fines are stored in the tube vaults. The hazard evaluation in the Safety Analysis Report applies assumptions from the HES to define controls for the applicable accident scenarios. In 2014, the applicable CSE was modified to allow storage of chips, turning and fines in certain configurations in Building 9720-5, but this CSE modification did not prompt a review of the HES. Compensatory measures were taken to suspend all hot work in the tube vaults and suspend receipt of additional materials into the tube vaults unless approved by the Operational Safety Board. The contractor, Consolidated Nuclear Security, LLC (CNS), initiated a PISA process for this discovery.

9212 Holden Gas Furnace Oil-Wetted Metal Fines: On July 26, 2018, production personnel determined that some amount of oil-wetted uranium-bearing metal fines from Building 9204-2E were processed through the Holden Gas Furnace in muffle pans, which was not evaluated in the CSE for the furnace. CNS reported this event as a Potential Nuclear Criticality Safety Issue. CNS personnel have put a hold on processing metal fines from Building 9204-2E in the Holden Gas Furnace and are determining the extent of the issue. CNS Nuclear Criticality Safety personnel are planning to perform a criticality safety analysis of the oil-wetted uranium-bearing metal fines in the muffle pans. They believe that this analysis will be bounded by a previous analysis of uranium-water mixtures in modified hospital cans.