

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 17, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending May 17, 2019

Board Member Visit: On May 14, Board Chairman B. Hamilton, staff member T. Davis and the resident inspectors met with federal and contractor personnel at the Y-12 National Security Complex to discuss numerous topics, including: (1) the April 2019 hydrogen fluoride event at Building 9212, (2) restart activities associated with the ultrasonic chip cleaning system in Building 9212, (3) material storage in the Highly Enriched Uranium Materials Facility, (4) the extended life program for Buildings 9204-2E, 9215, and 9995, and (5) Uranium Processing Facility construction. They walked down Building 9212, Building 9204-2E, and the Uranium Processing Facility construction site.

Building 9212: In April, CNS personnel identified a non-conservative input to a nuclear criticality safety evaluation that invalidated the current required response time for the accountable steam condensate isolation unit to close isolation valves for the tray dissolvers (see 4/5/19 and 4/26/19 reports). During the extent of condition review of other systems that rely on the accountable steam condensate isolation unit, a similar non-conservative input to the nuclear criticality safety evaluation was identified for the high capacity evaporator. The high capacity evaporator is used to concentrate uranium solutions. A review of historical operational data found that the uranyl nitrate concentration has been as high as approximately 60% above the assumed concentration in the engineering calculation. CNS personnel determined that this is a potential inadequacy in the documented safety analysis and an unreviewed safety question. The accountable steam condensate isolation unit for the high capacity evaporator was declared inoperable since the required isolation valve closure time was not known (pending a re-analysis with the new information) and this closure time is needed to determine whether the surveillance requirement could be met. CNS submitted a justification for continued operation and evaluation of the safety of the situation to NPO that describes the planned actions to resolve the issue.

As noted in the April 26, 2019 report, there are five systems in Building 9212 that credit the accountable steam condensate isolation unit response time. Thus far two systems (tray dissolvers and high capacity evaporator) have been confirmed to have non-conservative calculations. This week, CNS personnel entered the new information process for a third system (intermediate evaporator) due to it potentially being affected by a non-conservatism input assumption. The remaining two systems that credit an isolation response time are currently in warm standby mode.

Direct Chip Melt Project: This week NNSA provided CNS with authorization to proceed with the direct chip melt bottom load furnace project. The bottom load furnace approach was identified as a solution to radiological issues identified with the original design (see 12/21/18 report). The authorization letter stated that the direct chip melt bottom load furnace project will have an integrated glovebox system and chip compaction capability. The delivery date for this project is 2024. The first furnace of the original direct chip melt design has already been manufactured and is still planned to be installed in Building 9215.