DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 21, 2018

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending December 21, 2018

Direct Chip Melt Project: CNS has been developing the Direct Chip Melt (DCM) process since 2014 as a method for recovering uranium machine turnings and chips. The DCM project is part of the enriched uranium mission transformation strategy for ceasing enriched uranium programmatic operations in Building 9212 (see 11/7/16 report). With DCM, chip processing would be located in Building 9215 (where machining chips are generated) and result in a simplification of chip processing operations that involves fewer steps in the process.

The first DCM furnace was originally planned to be installed in October 2018. However, issues related to throughput, vendor quality assurance, and radiological contamination led to the project being paused. An evaluation by radiological control identified concerns with contamination on the outside of the crucible that could become airborne during transportation and unloading. Based on this evaluation, the operation would likely require respiratory protection. CNS began an evaluation process of the DCM project that resulted in a new approach to containment. The proposed DCM re-design will have the entire process enclosed in an integrated glovebox line. Cans of chips can be vertically loaded into the glovebox for processing and then unloaded in separate cans containing the product and oxide residues. The ability to compact the machining chips is also being considered since the integrated glovebox design offers an inert environment.

The first DCM furnace of the original design was already in fabrication at the time that the DCM project was paused. This furnace is being considered for installation in Building 9215 with additional controls (respiratory protection for portions of the operation) while the new DCM design is completed. In the interim, Building 9212 chip processing operations (including briquetting of chips) will be required to continue.

Continued Safe Operability Oversight Team (CSOOT): The CNS Y-12 CSOOT issued a report documenting its annual evaluation of the adequacy of Buildings 9212, 9215, and 9204-2E to support continued safe and reliable operations. The CSOOT identified no safety concerns that would provide reason to limit operations in these facilities. The recommendation from the 2017 CSOOT report to improve engagement of craft, supervisors, and subject matter experts in implementing the Extended Life Program was closed based on briefings held with all personnel in Buildings 9215 and 9204-2E. The CSOOT also reported on the benefits and improvements to the system health material condition program offered by a material condition inspection/monitoring training course that CNS developed. One of the CSOOT observations in the 2018 report noted reliability issues with chemical processing systems in Building 9212 due to material issues and aging of those systems. This observation raised concerns for sustaining these processes until new technologies, such as Electrorefining and Direct Chip Melt, are in place.

Building 9998: On 12/17/18, two operators were radiologically contaminated in a depleted uranium work area. Pinholes found in the vacuum hose are a suspected contamination source. A worker contamination event also occurred in Building 9998 last week (see 12/14/18 report).