

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 8, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending February 8, 2019

Building 9215: During a walkdown of an enriched uranium machining area, nuclear criticality safety engineers and system engineers examined a disassembled demister box for one of the machines. The demister box receives exhaust, which includes coolant and particles, from the machining hood. Liquid drains out of a tube at the bottom of the demister box while exhaust exits through the top of the box and enters ductwork attached to a stack. The drain tube is a small hole at the center of the bottom horizontal plate (plenum) of the demister. The engineers noted an unknown quantity of material inside the demister box on the plenum. The criticality safety evaluation assumes that normal conditions for machining operations involves periodically cleaning the demisters. However, in this context “cleaning the demisters” is actually referring to the demister filter. There are no controls in the criticality safety evaluation that require changing the filter, but the filters are replaced periodically. The demister box is not cleaned out since there is not a requirement to do so.

Following this observation, nondestructive assay (NDA) personnel took measurements of the demister box and demister filter. The measurements estimated 29 grams of uranium-235 in the demister plenum and 66 grams of uranium-235 on the demister filter. The demister plenum was subsequently wiped out and approximately 25 grams of uranium-235 were removed. After the cleanout, only a minimal amount of uranium-235 remained (less than 1 gram). The remaining machines (both active and out-of-service) with the same demister box configuration will be scanned by NDA personnel for potential accumulation of uranium-235.

Building 9212: An operational safety board (OSB) meeting was held to review the results of the Inadvertent Accumulation Prevention Program (IAPP) walkdowns for the reduction area and Stack 28 ventilation system (see 1/18/19 and 1/25/19 reports). The OSB members approved removing the administrative hold on reduction operations and accepted the recommendations of the IAPP walkdown team. The recommendations were all determined to be post-start actions. These actions include evaluating the approach for periodic roughing and sock filter replacement, evaluating the use of a portable dry vacuum for cleanup of sand under the hoods, determining a method to sample oil from the vacuum pump reservoir to confirm that the engineering controls are adequate to prevent fissile material from accumulating in the reservoir, evaluating a new Uranium Holdup Survey Program measurement point in a motor housing, and cleaning out the area under the rollers of the preparation and loading hood. Periodically changing the exhaust system roughing filters is a nuclear criticality safety requirement that had not been formally tracked for criticality safety purposes.

The IAPP assessment report for reduction is the initial version that was effective in January 2008. The remaining open recommendations from the 2008 report were either closed or assigned for further evaluation based on the recent walkdowns. All open items from the IAPP assessment report for Stack 28 were completed by 2014. The walkdown team recommended that both IAPP reports be updated.