

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 14, 2018

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending December 14, 2018

DNFSB Staff Activity: T. Davis was in Oak Ridge to provide resident inspector coverage.

Building 9212: The briquette that sparked when operators attempted to remove it from the argon-filled removal box on 11/26/18 was successfully transferred to the skull burner (see 12/7/18 report). This briquette and the briquettes pressed from the remaining chips in the briquette press enclosure were placed in argon-filled bags to prevent them from igniting after removal and during the transfer. The briquettes self-ignited when they were loaded into the skull burner. CNS is evaluating the sparking event to determine factors that may have contributed to these machining chips reacting in air immediately after being pressed. CNS is also evaluating options to allow resumption of the ultrasonic chip cleaning process.

Earthquakes: The United States Geological Survey reported two earthquakes—magnitude 4.4 and 3.0—centered 40 miles southwest of Oak Ridge. No structural issues were reported.

Building 9212: As noted last week, CNS declared a potential nuclear criticality safety issue (PNI) due to uranium holdup in out-of-service equipment (carbon burners and distillation units) and associated ductwork. The criticality safety evaluation for this equipment was performed in 1993 and subsequently suspended after the equipment was declared out-of-service. The Y-12 nuclear criticality safety program allows criticality safety evaluations to be suspended provided the “fissile material present will be controlled to prevent changes that may affect nuclear criticality safety during the suspension period.” For these cases, the suspended evaluation remains the basis for criticality safety and additional controls to prevent changes may be identified in the suspension document.

The suspension document for the out-of-service equipment requires periodic inspection for liquid intrusion into the associated ductwork. Non-destructive assay results from 2004 identified significant uranium holdup in the ductwork and filters. Based on the suspension surveillance and non-destructive assay results, Y-12 personnel were aware of criticality safety concerns for the uranium holdup; however, a criticality safety evaluation was not formally documented. CNS’s disposition of the PNI concluded that the criticality safety evaluation is inadequate but that the holdup material is subcritical during normal and credible abnormal conditions. CNS is also developing a plan to evaluate uranium holdup for other out-of-service equipment.

Building 9998: An operator alarmed a personnel contamination monitor while exiting a depleted uranium work area after performing mold preparation activities. Radioactive contamination above reportable levels was detected on the back of the operator’s head. The operator was successfully decontaminated. This work activity (mold preparation) has been performed extensively over the past year and this is the first contamination event related to it. The radiological work permit is planned to be revised to require operators to wear a hood until the specific cause of the contamination is determined through further evaluation.