

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 1, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending November 1, 2019

DNFSB Staff Activity: D. Brown attended an Energy Facility Contractors Group meeting at Y-12 regarding integrated safety management and quality assurance.

Building 9212: CNS reported a 3C-4 occurrence after identifying an inadequacy in the nuclear criticality safety evaluation for Building 9212 reduction operations. The issue was that an assumption in the criticality safety evaluation was not identified as a requirement and as a result was not flowed down to the operating procedure. The criticality safety evaluation assumes that sand from a failed run would not be processed through the sand separator. This assumption supported the maximum mass of uranium that was evaluated to be in portions of the equipment that collect sand. In a failed reduction run, unreacted UF₄ or finely divided metal mixed with the sand may result in a high concentration of uranium that is greater than the maximum mass of uranium evaluated in the criticality safety evaluation.

A previous version of the criticality safety evaluation protected the assumption by requiring that the sand shall not be processed through the sand separator until after the reduction product (button) mass has been compared to the uranium content of the UF₄ charge and the difference determined to be less than 50g uranium. The requirement that contained this detail and other specific actions to be performed during the reduction operation was developed in response to the 2017 discovery of unanalyzed uranium holdup in the sand separator (see 6/5/2017 and 7/17/2017 reports). A revision to the criticality safety evaluation approximately seven months later included a change to generalize the mass limit in that requirement. This change removed the specific actions that were written by the nuclear criticality safety engineers after the holdup discovery and left the implementation details to be specified in the operating procedure. During the operating procedure revision, the assumption that the criticality safety evaluation relied on for preventing sand from a failed run to enter the sand separator did not get captured since it was no longer explicitly stated in a criticality safety evaluation requirement.

The issue was identified by CNS criticality safety engineers while responding to a question from a NPO facility representative. CNS personnel followed their process for evaluating this as a potential nuclear criticality safety issue. The affected operations are on hold and the near term actions include revising the criticality safety evaluation and operating procedure.

NPO: NPO management conducted the final oral board for a facility representative assigned to Building 9212. The candidate successfully completed the oral board. This brings the total fully qualified facility representatives at Y-12 up to nine. NPO has one additional facility representative in training. Upon completion of the qualification process by the individual in training, NPO will have all facility representative positions filled by fully qualified personnel.

Y-12 Utilities: On Thursday, a thunderstorm resulted in an unexpected power outage covering a large portion of the plant. No significant impacts on nuclear facilities were reported.