

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 22, 2022

TO: Christopher J. Roscetti, Technical Director
FROM: Brandon Weathers, Resident Inspector
SUBJECT: Oak Ridge Activity Report for Week Ending April 22, 2022

Nuclear Criticality Safety: Last month, CNS reentered the potential inadequacy of the safety analysis process based on new information for the drum that contains Raschig rings and a uranium-bearing material (see 3/25/22 report). CNS determined that the new information from a second set of non-destructive assay measurements was a potential inadequacy of the safety analysis. The results of the second non-destructive assay measurement have not been verified due to uncertainties, but the non-destructive assay personnel were confident that the original fissile mass estimate was too low. This week, CNS completed the corresponding unreviewed safety question determination and concluded that this condition was an unreviewed safety question. The unreviewed safety question determination form acknowledged that the probability of an inadvertent nuclear criticality accident could be increased as a result of the drum not meeting current nuclear criticality safety program requirements. CNS expects that the neutron absorption properties of the Raschig rings may need to be credited as part of a new control set. If CNS credits the Raschig rings, then the control set would likely be elevated to the documented safety analysis and technical safety requirements. CNS is pursuing multiple options to gain additional data about the drum contents and plans to include those in a justification for continued operations that will be submitted to NPO.

Conduct of Operations: The resident inspector performed a limited review that sampled various Y-12 technical procedures. The sample set consisted of different technical procedure types, use categories, and activities. While this was a limited sample, most observations pertained to a Y-12 procedure type called a job performance aid (JPA). This procedure type is a single page format that only contains steps for performing the activity. For example, JPAs are not required to define prerequisite actions or precautions and limitations. In some of the reviewed JPAs, steps referenced other documents that contain information that could be considered a precaution or limitation. Some JPA action steps could also more appropriately be considered prerequisite actions rather than a normal activity step. For reference use procedures, the Y-12 conduct of operations manual requires that the performer acknowledge that prerequisite actions have been completed by checking off that action in the procedure. However, since JPAs do not contain prerequisite actions, steps that resemble prerequisite actions do not require a physical acknowledgement (i.e., checkmark). Another observation was that CNS has not made significant progress to address an issue regarding branching and referencing in JPAs (see 12/20/19 report).

CNS has made other improvements to technical procedures over the past year. After a nuclear criticality safety limit violation that involved an information use category procedure, CNS evaluated procedure use categories and made changes to some procedures (see 8/20/21 report). CNS also undertook actions to reinforce and update expectations for performing activities under the different procedure use categories. CNS incorporated those changes into the Y-12 conduct of operations manual. As part of ongoing conduct of operations focused reviews, CNS has continued to find and make specific improvements to individual procedures (see 1/29/21 report).