

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 8, 2021

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending October 8, 2021

NPO Oversight: NPO transmitted a letter to CNS regarding concerns with delayed potential inadequacy in the safety analysis (PISA) determinations. The CNS process for responding to new information involves an initial time allowance to determine the maturity of the information such that a PISA determination can be made. If CNS cannot determine the maturity within seven days, then the new information can remain non-mature for an undefined period of time. There have been several examples over the past year and a half where potential issues remained in the non-mature status for several months (see 7/16/21 and 8/27/21 reports).

Separately, CNS declared a PISA last week due to identifying a non-conservative error in a calculation of water loss in a neutron poison material. This material is used to fill interstitial space in a type of fissile material container and is a passive design feature that is credited for nuclear criticality safety in the Highly Enriched Uranium Materials Facility. The error related to CNS not modeling the full extent of water loss in a criticality safety calculation. As a result of this error, the basis for the passive design feature degradation analysis may not be adequate. To fully understand the impact, CNS will need to perform additional calculations. In the interim, CNS did not identify the need for any operational restrictions based on a review of monitoring results from some of these containers that showed a very small weight loss between 2010 and 2021. CNS previously evaluated this error in August and concluded that it was not a PISA. Since then, NPO discussed that conclusion with CNS and CNS reevaluated the issue and determined it is a PISA.

Building 9212: Last week, operators discovered that briquettes had expanded and pushed their container's lid out of position. The operators unsuccessfully attempted to push the lid back on the container, which is allowed as an action for field correctable conditions. Operators later found a second container in a similar condition. Y-12 has had issues in the past related to briquette storage that have resulted in storage boxes with indications of thermal stress and briquettes expanding and forcing the container lid off (see 6/30/17 and 8/18/17 reports). During another routine inspection last year, operators also found expanded briquettes. The containers that were discovered last week had been in storage since 2014. CNS has been working for several years to process the inventory of briquettes and recently projected that the entire inventory should be processed in 2022.

Modular Facility Operation: In 2020, CNS performed fissile material operations in a facility that had been approved by NPO as a Below Hazard Category 3 nuclear facility on the basis that a nuclear criticality accident is precluded by the nature of process and facility segmentation (see 1/3/20 and 6/26/20 reports). NPO recently approved CNS' request to perform the same type of activities authorized in the original approval on additional components. The nuclear criticality safety calculation for the newly authorized components has a greater safety margin than the original components. CNS also applied a more conservative value for a key input to the limited hazard analysis for the facility.