

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 27, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending September 27, 2019

Building 2026: The Oak Ridge Oxide Processing (OROP) campaign that will process U-233 for thorium extraction successfully completed a contractor readiness assessment (see 6/28/19 report). There were five pre-start findings. Four were closed during the assessment and the last was resolved this week. The OROP campaign could begin as early as Monday. The resident inspectors evaluated portions of the contractor readiness assessment (interviews, demonstrations, and a drill). Prior to the readiness assessment, the DOE Oak Ridge Office of Environmental Management (OREM) transmitted an operational restriction to the contractor, Isotek Systems, LLC (Isotek). This occurred after a DNFSB staff review team teleconference with OREM and Isotek personnel on August 29 (see 8/30/19 report). OREM has restricted the containers that can be processed in Building 2026 to a limited number that are loaded well below the masses of most of the other OROP containers. This restriction was put in place due to the need to clarify the criticality incredibility argument that is used in the safety basis and criticality safety documents. The operational restriction has been incorporated into the applicable Isotek operating procedures and forms. The initial containers allowed for the OROP campaign will not challenge the specific administrative control for the facility fissile mass limit. The effective version of the nuclear criticality safety evaluation includes error margin estimates for the historical processing data and accounts for potential holdup of material in the gloveboxes. A third revision to the nuclear criticality safety evaluation is being developed to provide additional justification for the remaining containers that are loaded with higher masses than the containers allowed to be processed under the operational restriction.

Building 9720-5: Several months ago, CNS declared a potential inadequacy of the documented safety analysis and determined an unreviewed safety question existed due to an error in the unmitigated toxicological consequences to the public in the event of a large fire in Building 9720-5. CNS submitted an updated justification for continued operation and evaluation of the safety of the situation to NPO for approval that incorporates this issue and previous issues related to the discovery of chips, turnings, cuttings, and fines in select vaults (see 11/16/18 and 8/10/18 reports). Though the unmitigated consequences to the public increased, the existing control set—most notably the safety significant fire suppression system—is considered adequate as DOE does not require safety class controls to prevent or mitigate accident scenarios with high toxicological consequences to the public. During NPO's review of CNS's submittal, CNS determined there was another positive unreviewed safety question. Specifically, the potential presence of cadmium was not considered when evaluating fire scenarios in one specific location not covered by a fire suppression system. Based on the quantity allowed per the hazardous material identification document, the unmitigated toxicological consequences could be moderate or high instead of minor as currently analyzed, calling into question the adequacy of the existing control set. CNS ensured there was no cadmium in the area without fire suppression and implemented a compensatory measure to prevent cadmium being stored there. CNS will prepare an evaluation of the safety of the situation and changes to the safety basis to address these issues and retire the previous justification for continued operation.