

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 20, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending December 20, 2019

Building 9204-2E: Since October 2018, a glovebox in the facility has been operating with additional precautions and observations due to a degraded mechanical seal. On two occasions, the seal plates separated and compromised the glovebox integrity (see 10/19/18 and 2/1/19 reports). The plate seal stuck and came close to compromising the glovebox integrity again in March (see 3/29/19 report). As a result of these issues, CNS personnel had been working on a new design. Installation and post maintenance testing were successfully completed for the new seal last week. The glovebox area has been cleaned and upon satisfactory sampling results, it will be returned to operations.

Building 9212: Twice this week, nuclear criticality safety back-offs occurred after discovering that a casting mass did not pour out of the crucible into the mold cavity (referred to as a failure-to-pour). Failure-to-pour events are anticipated to occur. The criticality safety evaluation for casting operations analyzes them and provides specific guidance for responding to this situation. An abnormal operating procedure exists that provides the guidance for responding to a failure-to-pour event as well as other less frequent casting abnormalities where the molten uranium may spill out of the casting stack assembly. The abnormal operating procedure has been on an administrative hold since April 2019 while it is revised to be consistent with the current criticality safety evaluation. With the abnormal operating procedure on hold, nuclear criticality safety must provide specific guidance to operations personnel each time a failure-to-pour occurs.

Other technical procedures involved with preparing components used in casting operations have been under revision since July 2019 as an action from a previous failure-to-pour event (see 6/28/19 and 7/19/19 reports). The cause of the failure-to-pour events this week may be different since the previously reported event was due to a missing component in the enriched uranium stack assembly. The procedures for mold preparation and stack assembly refer to the *Casting Stack Details* document which provides specific details and drawings of casting stacks that may be built. Building the stack assembly in accordance with the *Casting Stack Details* document is a criticality safety requirement for this operation.

An action from the fact finding for the June event was to determine the adequacy of embedded procedures and referenced documents, such as the *Casting Stack Details* document, in technical procedures. Examination of the closure evidence for this action found that CNS believes the scope of this issue needs to be expanded beyond the procedures used in that event. It was noted that a Y-12 procedure development tool includes guidance that highlights the increased potential for error when branching and referencing other procedures or documents. In completing this action, it was found that branching and referencing is commonly used in production technical procedures. Another issue was that CNS does not have a policy governing how procedure users perform steps where branching and referencing is required.