

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 26, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending April 26, 2019

Building 9212: CNS continues to recover from the leak of anhydrous hydrogen fluoride within the cylinder enclosure at Building 9212 (see 4/5/19, 4/12/19, and 4/19/19 reports). Regarding the new information discussed in last week's report about how the safety basis credits secondary confinement in conjunction with operation of the scrubber, CNS determined that a potential inadequacy of the documented safety analysis exists. As a compensatory measure, CNS will continually operate the scrubber until the justification for continued operation is approved by NPO and implemented.

CNS submitted a justification for continued operation and evaluation of the safety of the situation to NPO. The plan is to drain the hydrogen fluoride from the vaporizer back to the cylinder, purge the system, then perform maintenance to replace the rupture discs and repair the known leak site and any others that may be discovered. Among several compensatory measures, CNS proposed to further isolate the known leak point by closing a valve that normally is required to be open. This will prevent a pressure transmitter from performing its credited safety function, which is to help determine if the scrubber must be operating. CNS will operate the scrubber regardless of the pressure transmitter signal; making it unnecessary. In addition, CNS decided to disable one of the hydrogen fluoride detectors within the cylinder enclosure to prevent automatic isolation if there is a leak. There are several other detectors in the area that would provide an indication of any significant release outside of secondary confinement, and CNS will continually monitor the single active detector in the cylinder enclosure during the draining and purging operations. NPO approved this path forward via a safety evaluation report without conditions of approval. Separately, NPO directed CNS to develop and submit a safety basis change package that would allow draining and purging operations under abnormal conditions by November 2019. CNS plans to drain and purge the system next week.

Building 9212: On April 24, NPO issued a safety evaluation report approving the justification for continued operation and evaluation of the safety of the situation for the potential inadequacy in the documented safety analysis for the accountable steam condensate isolation unit for the tray dissolver system (see 4/5/19 report). CNS performed new evaluations of the isolation unit response time associated with the tray dissolver system to develop compensatory measures for resuming operations. The evaluations show that with the four compensatory measures the technical safety requirement for the isolation valve maximum response time will be met. The compensatory measures are: (1) limit the number of trays that can be operated concurrently, (2) limit the mass of enriched uranium per tray, (3) restrict the material form allowed to be processed, and (4) verify a dimension in the system prior to loading a tray. The resident inspectors have noted that four other systems rely on the accountable steam condensate isolation unit response time to limit the mass of fissile material that could enter the storm drain system, which is an unfavorable geometry. CNS is evaluating these systems to determine whether there are similar non-conservative assumptions regarding the concentration of fissile material.