DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 16, 2016

TO: Steven Stokes, Technical Director
FROM: William Linzau and Rory Rauch, Site Representatives
SUBJECT: Oak Ridge Activity Report for Week Ending May 13, 2016

Building 9212/Nuclear Criticality Safety (NCS): CNS has determined that a potential inadequacy in the safety analysis (PISA) identified last month (see 4/22/16 report) is a positive Unreviewed Safety Question (USQ). The wet-vacuum systems (WVSs) in Building 9212 were placed out of service last month due to inaccuracies in the supporting calculation that verifies timely operation of NCS controls. Each WVS has a credited conductivity probe in a trap that signals an isolation valve to shut upon detection of solution (see 2/27/15 report) and prevents inadvertent transfers to areas with uncontrolled geometries. The calculation did not accurately calculate the solution flowrates to ensure the isolation valve shuts prior to transfer to downstream components. CNS has submitted a justification for continued operation (JCO) for NPO approval that addresses about half of the WVS processing lines that serve various production operations. In support of the JCO, CNS Engineering personnel reviewed data on valve closure times that were collected during previous surveillances and selected five seconds as the maximum response time for the isolation function. For these specified processing lines, the engineers calculated that the trap would not fill to above half of its volume in five seconds therefore the isolation valve would function in time to prevent solution transfer past the credited trap. NPO is currently reviewing this JCO as CNS evaluates the remaining WVS processing lines not covered by this JCO. Preliminary calculations of these remaining WVS lines showed that the traps could fill to half full in less than five seconds and will require different criteria to provide assurance of NCS.

Building 9212/Material-at-Risk (MAR) Reduction: Last week, NPO approved a CNS safety basis document change notice that supports a proposed change in the operation of the secondary extraction (SX) enriched uranium (EU) purification process. The change allows operators to add small quantities of diluent directly into the process tanks that hold organic solvent feed for the SX process through a newly installed connection to the system. The previous practice was to replace the full batch of organic solvent with one that contains the appropriate concentration of diluent, which is lost over time due to evaporation. This practice increased the generation rate of uranium-bearing organics that required processing to recover the uranium prior to final disposition as waste.

This change was initiated as part of CNS's ongoing efforts to reduce the MAR in Building 9212. The January 2015 Implementation Plan for the EU Mission Strategy—recognizing that uranium-bearing organics in Building 9212 posed a much higher radiological risk than equivalent quantities of uranium metal or oxides if consumed in a fire—focused on ways to accelerate the disposition of waste organics. However, within the last year, CNS recognized that this small process change (the ability to add diluent to the organic solvent) could significantly reduce MAR by reducing the amount of waste organics generated.

Building 9204-2E/Building 9215 Extended Life Program (ELP): CNS provided a response to last month's NPO letter (see 4/22/16 report) in which NPO asked that CNS conduct specific actions related to the ELP, including development an ELP safety strategy. In its response, CNS notes that it has developed a draft safety strategy that provides a path forward to address major gaps in meeting the current nuclear safety requirements. In addition, CNS has secured funding for this year that will support structural analysis and evaluations by seismic experts of Buildings 9215 and 9204-2E. The safety strategy will be submitted for NPO approval on June 30, 2016. The response also states that a revised Y-12 Aging Management Plan and an ELP Implementation Plan are planned to be submitted by November 1, 2016.