

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

TO: Steven Stokes, Technical Director
FROM: William Linzau and Rory Rauch, Site Representatives
SUBJECT: Oak Ridge Activity Report for Week Ending September 19, 2014

Uranium Processing Facility (UPF): The classification of natural phenomena hazard (NPH) design categories (NDCs) for structures, systems, and components (SSCs) is primarily a function of the unmitigated radiological dose consequences that result from failure of the SSC, as captured in DOE Standard 1189, *Integration of Safety into the Design Process*. Generally, application of this guidance for a criticality accident would lead to an NDC-1 or NDC-2 SSC classification. However, DOE Standard 1020, *Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities*, contains an exception whereby “SSCs whose safety function establishes single contingency for NPH shall be designed to an NDC-3 and appropriate limit state (i.e., SSCs whose NPH-initiated failure alone can lead directly to a criticality accident shall be designed to NDC-3...)” This requirement has been the subject of debate as UPF project personnel begin conceptual design for the multi-building approach (see 4/18/14 and 5/9/14 reports) while attempting to implement the Red Team recommendation to re-evaluate requirements for overly conservative interpretations that may be unduly impacting project cost.

In July, UPO, NPO, NNSA headquarters representatives, and project personnel held a meeting to discuss the appropriate application of this requirement. A CNS Mission Engineering staff team utilized guidance given during this meeting to determine the appropriate NCS-driven NDC classifications for UPF. The team recommended that the base mats of the Main Process Building (MPB) and Salvage and Accountability Building (SAB), as well as the MPB facility structure (walls, ceiling, and roof), be classified as design category-3 for all credible NPH events. Alternatively, the SAB structure will be classified as design category-2 for the seismic and wind events. The UPF project team captured this information in the latest Safety Design Strategy, which was submitted to NPO and UPO for approval this week.

Building 9202 (Technology Development): Last week, facility personnel noted that a 5-gallon drum containing depleted uranium (DU) fines had a bulged lid. The facility manager took appropriate response actions and the Spill Response Team and the Fire Department determined the drum did not pose an emergency condition. This week, facility personnel coordinated with the Infrastructure Management organization to successfully vent the bulged drum and four other similar drums that were sealed but not bulging. Since 2011, these drums were used to collect DU fines from saw cutting in the Building 9202 foundry. The drums were sealed in late July with unvented lids in order to facilitate moving the drums out of the foundry. Leaving the drums unvented is not consistent with requirements in the hazard evaluation study for this activity but vented lids had not been procured prior to moving the drums. Facility management has developed a number of corrective actions including performing an extent of condition review of storage conditions for all containers with similar materials in Building 9202.

Building 3019: This week, a buried fire water supply line ruptured below the paved yard outside Building 3019, causing two inches of water to collect in parts of the facility’s basement. The line ruptured due to a pressure transient in the potable water system at ORNL. The ORNL fire department isolated the leak and Isotek personnel established fire watches until a temporary hose was connected to the facility’s sprinkler system. The system, which is credited in the safety analysis for defense-in-depth protection, was tested to ensure that it could still send a signal to the fire station when activated. Radiological surveys of the affected areas did not detect any release of contamination. Facility managers are developing recovery actions including an excavation to repair the ruptured line and cleanup of the water in the two flooded rooms.