

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 31, 2024

TO: Timothy J. Dwyer, Technical Director
FROM: L. Lin, Z.C. McCabe, and E.P. Richardson, Resident Inspectors
SUBJECT: Savannah River Site Activity Report for Week Ending May 31, 2024

Staff Activity: Members of the Board's technical staff, S. Seprish and S. Sircar, were on site to review the Savannah River Plutonium Processing Facility's safety controls for facility workers.

Salt Waste Processing Facility (SWPF): During an inspection, an engineer discovered that one of the external electrical bus ducts that provides power to several pumps in the Alpha Finishing Facility part of SWPF was damaged. The bus duct was de-energized and the facility is currently developing a temporary modification to power the affected motor control center from an alternate source before the facility will start back up. Facility personnel performed visual inspections of the other bus ducts and did not find any other issues. They also took resistance readings on the damaged bus duct and found much lower resistance than expected. This is concerning considering that two previous catastrophic bus duct failures occurred at SWPF last year (see 11/10/23 and 4/21/23 reports). Last week, an engineering forensic company picked up the two previously damaged bus duct sections and plans to perform forensic analysis around the July timeframe to determine the root cause of the failure, which is currently unknown. This week, SWPF received all the parts and began the repairs for the first bus duct failure from April of last year. Although the bus ducts are general service components, reliable power is essential to sustain salt waste processing for accelerated risk-reduction in the liquid waste system.

Lightning Protection Systems (LPS): The resident inspectors (RI) conducted a walkdown of LPS at Savannah River Tritium Enterprise (SRTE) earlier this year and held follow-up discussions with the contractor and NNSA-SRFO. DOE Standard 1212-2012 and NFPA 780-2011 require installation, inspection, and testing of a LPS for explosives facilities. SRTE personnel perform annual visual inspections of the lightning protection system from the ground level to check for the presence of key components, but do not perform required electrical continuity inspections or resistance testing for their explosives facilities. SRTE cites an exception from DOE requirements by claiming that in the event that a lightning strike did initiate one or more of the actuators, the detonation/explosion does not increase the probability of loss of the building or harm to any personnel present in the building. While the LPS is not a credited safety system, lightning is a potential initiator for several fire events in the SRTE safety bases. The RIs questioned the contractor's basis for not needing a properly maintained LPS and whether NNSA-SRFO accepts the risk associated with any loss of explosives facilities or personnel injury due to lightning events in those facilities.

Savannah River National Laboratory's (SRNL) LPS coverage of the main facility is limited to the protection provided by the strike terminals installed on the two stacks, which leaves a significant portion of the facility without protection. The LPS is not a credited safety control, though lightning strikes are considered an initiator for multiple accident scenarios in the SRNL safety basis. Discussions with SRNL personnel revealed no drawings of the systems or any historical inspections. Additionally, the SRNL roof has a significant number of components without protection, including a tower of unknown origin approximately as tall as the stacks.