

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 3, 2021

TO: Christopher J. Roscetti, Technical Director
FROM: A. Gurevitch, M. Bradisse (acting), and C. Berg (acting), Resident Inspectors
SUBJECT: Pantex Plant Activity Report for Week Ending September 3, 2021

Electrostatic Discharge (ESD) Event: On Monday, while performing assembly operations on a unit in a nuclear explosive cell, a production technician felt a static electrical discharge between his elbow and a tooling fixture installed on the unit in the workstand. Other production technicians corroborated this observation and noted that they clearly heard a sound that could have been a static discharge. Before and during this event, the technician performing the work was standing on a conductive mat on the floor next to the workstand. These mats are commonly installed with workstands in nuclear explosive facilities and serve as protective cushions in the event a high explosive charge is dropped (and are therefore called “HE mats”). The technician was resting his arm on the installed piece of tooling while working on the unit, momentarily removed his arm but remained standing on the mat, and then returned to his prior position when he felt the discharge.

The technicians paused operations and notified their supervisor of the event. Personnel from the process engineering, safety analysis engineering, and nuclear explosive safety organizations entered the cell and determined the unit was in a safe and stable configuration. Of note, CNS personnel did not identify any damage to the unit resulting from the event. Access to the facility has been restricted. CNS stopped work on all cell operations for this weapon program, as well as all weapon programs that use this particular mat.

CNS has performed an initial evaluation of the engineered controls for ESD hazards and has not discovered an obvious failure mode. The installed piece of tooling involved in this event is not an isolated conductor, and therefore is not likely to become electrically charged. The technician was wearing appropriate company-issued cotton coveralls and electrostatic dissipative footwear. The footwear was checked for functionality before entering the cell, as required for entry, and re-verified again (a non-standard practice) upon leaving the cell after the event. The footwear checker was determined to be functional and within its preventive maintenance cycle; the last functional check on that equipment was performed two weeks ago. CNS reviewed the maintenance records for the cell’s electrostatic dissipative floor and found that it passed the test criteria during its last verification. CNS also reviewed the HE mat test reports, which indicated that the mats should provide the required electrostatic dissipation.

CNS is developing a test plan to evaluate the electrostatic-dissipative properties of the HE mats, including the specific mat involved in this event; the latter will require a specially-developed procedure to allow personnel to remove it from the facility. CNS will also set up a similar nuclear explosive cell with a high fidelity mock-up of the unit configuration, along with instrumentation to measure static fields and other electrical phenomena, and will attempt to recreate the event to determine what could have caused the initial electrical charge and subsequent discharge.