

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 7, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: C. Stott and C. Berg (acting), Resident Inspectors
SUBJECT: Pantex Plant Activity Report for Week Ending July 7, 2023

Unauthorized Equipment: Pantex utilizes various Ludlum Alpha Monitors within its defense nuclear facilities to assess radiological contamination. Given that this equipment will not connect to nuclear explosive electrical circuitry but may come into contact with nuclear explosives, CNS reviews and approves these monitors as Category Two electrical equipment. This week, CNS Process Engineering requested to add a certain Ludlum Alpha Monitor—i.e., tooling number 000-2-1881—for use in a procedural document, prompting a review by the CNS Facility Engineering Electromagnetics group. During this review, they discovered that a revision to an Electrical Equipment Evaluation had been in process to include this tooling number to the list of approved Category Two electrical equipment, but the evaluation was never published. As a result, these Ludlum Alpha Monitors did not appear to receive the proper authorization for use as Category Two electrical equipment. Nevertheless, CNS Metrology completed additional documentation to place a Category Two electrical equipment sticker on these devices.

Upon learning of this discrepancy, CNS removed suspect monitors from two operational facilities. During the event investigation, CNS initially categorized the incident as having an adverse effect on nuclear explosive safety due to the presence of unanalyzed or unauthorized equipment. However, during the critique, CNS found that site procedures, including those authorizing Category Two electrical equipment for certain operations, had included generic terminology to include all Ludlum Alpha Monitor variations for operational flexibility. Consequently, tooling number 000-2-1881 may have been technically authorized for use in nuclear explosive areas. CNS plans to reevaluate these conclusions, as well as assess potential implications within the safety basis, in the coming weeks. However, given the complications resulting from generic terminology use, CNS intends to revise the Electrical Engineering Evaluation to explicitly list all authorized models of the Ludlum Alpha Monitors.

Facility Appurtenances: During execution of semi-annual preventive maintenance on manual chain hoists within a nuclear explosive cell, CNS maintenance personnel discovered one missing fastener along with several loose fasteners on the same hoist. As an extent of condition, CNS also discovered loose cover fasteners on the other hoist in the same facility. As described in the Technical Safety Requirements, appurtenances within nuclear explosive facilities are designed to remain in place during design basis seismic events to prevent impacting a nuclear explosive. As a result, CNS categorized the event as a safety basis noncompliance.

Of note, site personnel identified this discrepancy despite the semi-annual preventive maintenance procedure not specifically directing inspection of these cover fasteners. During the most recent annual inspection, which does include fastener inspection, CNS did not find any issues with these components. As interim corrective actions, CNS initiated work orders to apply thread-locking fluid to the affected fasteners including on hoists in a second facility. CNS is also planning longer-term corrective actions to replace the fasteners for ones with engineered features to prevent self-loosening.