DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 22, 2024

TO: Timothy J. Dwyer, Technical Director
FROM: A. Holloway and C. Stott, Resident Inspectors
SUBJECT: Pantex Plant Activity Report for Week Ending November 22, 2024

Special Tooling: Recently, the site contractor discovered failures of a certain rotational locking mechanism within two lifting and rotating fixtures (see 8/30/2024 and 10/18/2024 reports). This month, PXD tooling and tester engineering personnel presented results from analyses they conducted—including dynamic and detailed static methods—to the resident inspectors and PFO. PXD highlighted that during dynamic loading, a localized area of high stress develops in the vicinity of the observed failures for both tools. This area of high stress is partly due to the interaction of other tooling components with sharp edges that apply force over a smaller area than originally analyzed. This high stress condition is exacerbated by a machined feature with thin walls, thus limiting the amount of material in the vicinity of the predicted high stress. As a result of this analysis, PXD tooling and tester engineering personnel have made several recommendations to improve the design of these tooling components that include rounding the component edges and minimizing the depth of the thin-walled machined feature. Furthermore, PXD safety analysis engineering personnel noted that the safety basis documents may need to be changed and justification provided to explain why the pawl-type feature of the lifting and rotating fixture is designed to deform and yet still meets the performance criterion to not deform under analyzed loading scenarios.

Additionally, this week, PXD resumed nuclear explosive operations involving certain copies of an enhanced transportation cart that previously had loose locking mechanism fasteners. These enhanced transportation carts are used to transport nuclear explosives, and the locking mechanisms are designed to help restrain the nuclear explosives inside the cart. PXD personnel paused operations with these carts after quality assurance technicians encountered one locking mechanism that detached from the cart during handling (see 9/13/2024 report). Prior to resuming operations, PXD special tooling program personnel inspected and secured the locking mechanism fasteners on all the affected copies.

Recommendation 2019-1 Effectiveness Review: On October 28, 2024, PFO transmitted a memorandum to the site contractor declaring the completion of an NNSA effectiveness review of corrective actions developed in response to the Board Recommendation 2019-1, *Uncontrolled Hazard Scenarios and 10 CFR 830 Implementation at the Pantex Plant*. In its June 2024 letter, the Board requested a briefing from NNSA on the results of the effectiveness review within 60 days of review completion.

Nuclear Explosive Safety: Last month, a nuclear explosive safety (NES) study group performed a validation of recently resumed nuclear explosive operations for a certain weapon program (see 11/8/2024 and 8/23/2024 reports). NES validations ensure actual operations are consistent with those demonstrated during the NES evaluation. This validation was a condition of approval for the NES study extension granted by NNSA headquarters earlier this year (see 5/31/2024 report). According to the memo, the study group did not identify anything that would affect the rationale for the NES study extension or conclusions of the previous NES evaluations.