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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Washington, DC 20004-2901



July 20, 2022

The Honorable Jill Hruby
Administrator
National Nuclear Security Administration
US Department of Energy
1000 Independence Avenue, SW
Washington, DC, 20585-1000

Dear Administrator Hruby:

The Defense Nuclear Facilities Safety Board (Board) supports the National Nuclear Security Administration's (NNSA) objective of accomplishing its national security missions efficiently and has noted a number of opportunities to improve the safe execution of various initiatives underway at Pantex. The Board has already discussed some of these with NNSA senior leadership (i.e., proposed revisions to DOE-NA-STD-3016, *Hazard Analysis Reports for Nuclear Explosive Operations*, and co-located unit operations for a nuclear weapon system that uses conventional high explosives). In addition, the Board understands that Pantex is expanding nuclear explosive operations in other ways, including the addition of a full-time graveyard shift, hiring of additional personnel, and potential changes to some operating procedures. The Board thanks NNSA for its additional consideration of the Board's safety concerns and looks forward to further dialogue on these subjects. Additional detail is provided below as NNSA works to improve operations at Pantex. The Board is seeking to ensure that safety is paramount when considering these operational changes.

DOE-NA-STD-3016 Revision—DOE-NA-STD-3016 is a limited standard invoked to govern safety analyses for nuclear explosive operations. NNSA proposed revising the standard to codify a significant increase in the screening threshold for determining whether high-order nuclear accident scenarios involving fully assembled nuclear explosives warrant safety class controls. Discussions between the Board's staff and NNSA staff indicated that NNSA staff were pursuing this change to improve productivity by allowing onsite transportation of fully assembled nuclear explosives during lightning warnings. However, the change was withdrawn after a discussion of technical disagreements regarding the safety risk. As the Board understands it, NNSA staff now plan to analyze the safety risks of onsite transportation during lightning warnings using natural phenomena hazard and man-made external event initiating frequencies, consistent with DOE-STD-3009, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*. In the Board's view, this approach of characterizing and controlling the risks associated with such activities is a more appropriate path forward than increasing risk acceptance for operations involving fully assembled nuclear explosives at Pantex.

Proposed Co-Located Unit Operations—Under the current safety framework at Pantex, the assembly and disassembly of nuclear explosives with a conventional high explosive main charge are performed with only one such unit in the bay or cell. This approach prevents an accident on one unit from initiating an additional—and possibly more severe—accident on a second unit. The management and operating contractor at Pantex proposed an operational change for a specific weapon program with conventional high explosives that would allow conducting assembly or disassembly operations on a nuclear explosive while a fully assembled nuclear weapon of the same type is staged in its handling gear in the same nuclear explosive bay. The Board notes that such operations would be precedent-setting, as it is very unusual to have two or more units with conventional high explosives in-process in the same facility (i.e., such operations are only done in very specific circumstances, with several additional layers of safety in place). Discussions between the Board’s staff and NNSA and contractor personnel indicated that the contractor expected some productivity improvement, primarily from gaining flexibility to move the fully assembled unit into or out of the bay at a more opportune time (e.g., when not impacted by a lightning warning).

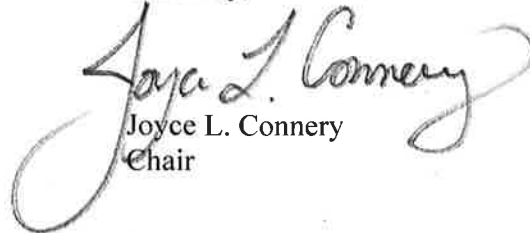
The contractor’s position as described in the proposed safety basis change was that all accidents involving the unit undergoing operations were reliably prevented by existing controls. As a result, the contractor did not fully evaluate the increased risk of high-order events, particularly events involving the second unit caused by accidents involving the first unit. However, the Board notes that the presence of the staged unit would increase both the unmitigated and mitigated risk of a high-order accident due to the additional scenarios with high-order consequences. After technical discussions regarding the safety issues, the contractor withdrew both the proposed safety basis change and its request for NNSA to perform a nuclear explosive safety change evaluation. The Board encourages NNSA to consider the opinions and concerns of nuclear explosive safety study (NESS) group members, and also encourages NNSA to emphasize the NESS’ vital, independent role in ensuring safety at Pantex. The contractor’s withdrawal letter states that it is pursuing an alternate proposal and will request a nuclear explosive safety evaluation in the future. The Board looks forward to additional dialogue on the safety risks and benefits of the alternate proposal as it develops, and expects that any proposals for co-located unit operations in the future will be fully analyzed for the increased risk of high-order events.

Expanded Nuclear Explosive Operations—On June 9, 2021, the Board transmitted a letter to the Secretary of Energy detailing issues with conduct of operations, training and qualification, and organizational culture at Pantex. In its August 5, 2021, response, NNSA detailed an extensive set of improvement actions, notably longer-term enhancements such as establishment of a Labor and Management Partnership and a joint Disciplined Operations Council, personnel resource augmentation, and improvements to training and to the weapons training complex. However, over the past several months, the Board’s resident inspectors have reported on several operational changes that, if not thoroughly considered and analyzed, could disrupt the positive trajectory NNSA sought to establish in response to the Board’s findings. For example, the contractor is moving to expand the set of approved operating procedures to encompass processes previously approved on a case-by-case basis for off-normal units and add a full-time graveyard shift, increasing operational complexity.

The Board's most recent correspondence to NNSA, dated May 10, 2022, focused on the breakdown of the Pantex external dosimetry program and noted the need for NNSA to reassess and bolster its oversight strategy to ensure that similar issues are adequately addressed and future potential programmatic breakdowns are prevented. The suite of changes being pursued at Pantex likewise requires close monitoring to ensure that operational safety and the underlying organizational culture are not compromised. The Board urges NNSA to fully analyze and consider the effects of the operational changes at Pantex, to ensure that safety is enhanced as described in NNSA's August 2021 letter. The Board also advises NNSA to consider implementing near-term actions, such as increased direct oversight of operations by federal personnel experienced in conduct of operations, to ensure this changing operational environment does not lead to unintended safety impacts. Such safety oversight is especially important now, given the known weaknesses in conduct of operations and issues with the organizational culture at Pantex.

Pursuant to 42 United States Code § 2286b(d), the Board requests that NNSA, within 60 days of receipt of this letter, provide the Board with a briefing on how NNSA plans to maintain the positive trajectory of its previously-communicated improvement initiatives for conduct of operations and organizational culture at Pantex during these operational changes. Additionally, if NNSA elects to approve new operations involving multiple units using conventional high explosives in a single nuclear explosive bay or cell, the Board requests that NNSA notify the Board of this decision and follow up with a report that details the basis for NNSA's decision, including its consideration of any additional safety controls and how NNSA evaluated safety risk versus operational benefit.

Sincerely,



Joyce L. Connery
Chair

c: Ms. Teresa Robbins
Mr. Joe Olencz