



Department of Energy
Under Secretary for Nuclear Security
Administrator, National Nuclear Security Administration
Washington, DC 20585



October 7, 2022

The Honorable Joyce L. Connery
Chair, Defense Nuclear Facilities Safety Board
625 Indiana Avenue NW, Suite 700
Washington, DC 20004

Dear Chair Connery:

This letter and enclosed report are provided on behalf of the Secretary, in response to your May 10, 2022, letter regarding the external dosimetry program breakdown that occurred in 2020 at the Pantex Plant (Pantex). In your letter, the Defense Nuclear Facilities Safety Board (Board) identified several opportunities to improve federal oversight and Management & Operating (M&O) contractor management of the Pantex External Dosimetry Program. The Board specifically noted a perceived lack of requirements and general weakness to ensure compliance with DOE-STD-1095-2018, *Department of Energy Laboratory Accreditation Program for Personnel Dosimetry*. The Board asserted that the negative effects of the external dosimetry equipment failures could have been prevented if Consolidated Nuclear Security, LLC (CNS) had tested and demonstrated its emergency backup plan with the Nevada National Security Site (NNSS).

The Department of Energy's National Nuclear Security Administration (DOE/NNSA) evaluated the Board's report and validated that operations associated with the CNS Enterprise External Dosimetry Program continue to meet all safety requirements. Routine oversight activities conducted by the NNSA Production Office (NPO) continue to provide adequate protection for workers, members of the public, and the environment. However, NPO commits to refine its oversight strategies to ensure risk ratings are adjusted based on emerging issues. DOE/NNSA sees opportunities to enhance NPO's oversight processes related to issues management and to better align that process with CNS' escalation process. DOE/NNSA will continue to monitor the performance of the CNS Enterprise External Dosimetry Program.

DOE/NNSA appreciates the Board's observations and insights, and will coordinate with your staff to conduct a briefing specific to the enclosed report. If you have any questions, please contact Mr. Daniel Sigg, Acting Associate Administrator for Environment, Safety, & Health, at (202) 586-4096 or Ms. Teresa Robbins, Manager, NNSA Production Office, at (865) 576-0841.

Sincerely,

Jill Hruby

Enclosure

Response to the Defense Nuclear Facilities Safety Board, Pantex Plant External Dosimetry Program

Beginning in October 2019, Consolidated Nuclear Security, LLC (CNS) began experiencing equipment failures in its dosimetry processing equipment at the Pantex Plant (Pantex). At the time, CNS was able to implement short-term fixes to ensure proper processing of dosimeters. Over the next several months, Pantex was able to process dosimeters with intermittent issues, until equipment completely failed. At that time, Pantex initiated its planned back-up method of dosimetry processing, which was to send dosimeters from Pantex to the Nevada National Security Site (NNSS) for processing. While NNSS had U.S. Department of Energy (DOE) Laboratory Accreditation Program (DOELAP) Accreditation for its Dosimetry processing, its equipment and algorithms were developed and calibrated to provide dose results applicable under the specific conditions and radiation fields at NNSS. Attempts to apply Pantex equipment settings and algorithms on the NNSS readers failed to provide usable results. In order to continue dosimeter reading while a solution was developed, NNSS continued to read Pantex dosimeters and provided the raw output data back to Pantex for future conversion to a dose value. During this period, DOE's National Nuclear Security Administration (NNSA) Production Office (NPO) continued to conduct oversight of CNS and provided guidance, feedback, and recommendations for potential paths forward.

DOE/NNSA examined the following Defense Nuclear Facilities Safety Board (Board) concerns as outlined in the Board's May 10, 2022, letter to the Secretary of Energy:

- Reliance on DOELAP accreditation and the need to periodically exercise the emergency backup plan;
- Breakdown of Pantex External Dosimetry equipment;
- Discrepancies in the 2020 Pantex thermoluminescent dosimeter (TLD) readings by NNSS;
- Inconsistencies in the adequacy of knowledge management processes;
- Insufficient management of the Dosimetry Quality Assurance Program; and,
- Potentially inadequate NPO oversight.

In response to NPO's Management Concern, CNS performed a causal analysis and developed a corrective action plan aimed at ensuring DOELAP accreditation. CNS actions included a project to completely revamp the External Dosimetry Program and address staffing issues. CNS performed a DOELAP pre-assessment that revealed additional gaps, which were also addressed. The CNS Enterprise External Dosimetry Program regained DOELAP accreditation on March 22, 2022. CNS also increased senior management involvement, clarified roles and responsibilities, and created an Enterprise External Dosimetry Program Lead position that serves as the technical authority over performance of the external dosimetry program.

CNS developed a series of lessons learned based on the realizations discovered during the causal analysis, DOELAP pre-assessment, and prior discussions with the Board. In these lessons learned, CNS documented the failure to replace aging equipment and test backup systems; attrition of key personnel that created a situation where remaining staff lacked requisite

knowledge, experience, and capabilities; and the ineffectiveness of assessments and corrective actions. Through the various reviews that have taken place, CNS documented specific actions to prevent recurrence, such as planning for equipment end of life (EOL), routinely evaluating aging equipment, and keeping maintenance contracts current. The need for continuing training, detailed program assessments, and succession planning for qualified personnel are also included as recommended actions.

NPO will carefully consider the Board's report for potential oversight improvement and will take near term action to clarify expectations regarding the risk-rating process. NPO identified an opportunity to evaluate the landscape of the M&O's single points of equipment failure to better understand the risks to mission and operations. NPO is also on track to complete an ongoing assessment of the Pantex External Dosimetry Program and has scheduled a fiscal year (FY) 2023 shadow assessment to further evaluate this topic. The previous risk rating adjustments made in FY 2022 were retained in FY 2023.

NPO will ensure lessons learned are documented and take responsive corrective actions with regard to the following topics:

- Monitoring staffing challenges that have impeded the M&O contractor's ability to preemptively recognize potential issues.
- Evaluating the testing of backup systems and alternate evaluation methodologies to mitigate against programmatic breakdowns.
- Improving the NPO escalation process for further alignment with the M&O Contractor's escalation process.
- Inserting trigger points in the NPO issues management process to elicit a formal response from the M&O contractor in certain cases.

The DOE Office of Environment, Health, Safety and Security (EHSS) developed a project justification statement for a revision to DOE-Standard-1095-2018, *Department of Energy Laboratory Accreditation Program for Personnel Dosimetry*. The planned revision will further clarify several provisions of the Standard, including backup processor requirements for continuity of operations. EHSS plans to initiate changes to the Standard in the Fall of 2022 through the Department's Technical Standards review process. In addition, the Assessor training for both external dosimetry and radiobioassay programs has been modified to increase focus on the examination of the backup processor and continuity of operations plans.

The NNSA Office of Environment, Safety, and Health (NA-ESH) identified External Dosimetry Programs as one of three enterprise-wide focus areas in the FY 2023 Site Integrated Assessment Planning guidance to all NNSA sites for consideration. The planning guidance specifically states:

The DNFSB recently determined that the Pantex external dosimetry program broke down due to several latent issues (e.g., personnel turnover, inadequate knowledge management, obsolete equipment, lack of timely contract maintenance support, and lack of availability of equipment parts) in 2019 and 2020. The backup equipment did not accurately read the doses due to calibration differences. The site should also consider periodically demonstrating functionality of backup equipment or test provisions to use another DOELAP-accredited laboratory in the event of an emergency. There is opportunity to have sites review their respective external dosimetry programs.

NA-ESH separately worked through its radiation protection community of practice to identify the external dosimetry systems and their backup plans employed at each site in order to evaluate the potential for recurrence of the problems at Pantex and to ensure field office and M&O Radiation Protection subject matter experts continue to track the issue.

NNSA is collaborating with the DOE EHSS Corporate Operating Experience Program to incorporate lessons learned from the Pantex External Dosimetry Program breakdown into DOE-wide Operating Experience articles for broad distribution.

NNSA appreciates the extensive effort put forth by the Board to research and evaluate the adequacy of the external dosimetry program at Pantex. The nature of the actionable feedback enables DOE, NNSA, and CNS to take meaningful actions to address this event and its lessons learned.