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

September 13, 2022

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

Dear Chair Connery:

This letter and enclosed report respond to your January 6, 2022, letter to Secretary Granholm. The enclosed report was developed by the Department of Energy's National Nuclear Security Administration (DOE/NNSA) and DOE's Office of Environmental Management and addresses communication regarding safety concerns with the Los Alamos National Laboratory onsite Transportation Safety Documents, and the safe harbor methodology for transporting certain materials onsite at Department of Energy (DOE) defense nuclear facilities, in accordance with 10 Code of Federal Regulations Part 830, *Nuclear Safety Management*.

The enclosed report details DOE/NNSA's agreement with and plans to address the Board's concerns. DOE/NNSA will also coordinate with your staff to conduct a briefing about the attached report.

Your January 6 letter also highlighted improvements that DOE/NNSA could consider regarding the safety of onsite radiological materials shipments at DOE/NNSA defense nuclear facilities. DOE/NNSA will begin evaluating how onsite transportation safety at DOE defense nuclear facilities can be improved.

DOE/NNSA appreciates the continued coordination with your staff to enhance safety while effectively managing these materials across the defense nuclear complex. If you have any questions, please contact Mr. Daniel Sigg, DOE/NNSA Acting Associate Administrator for Environment, Safety, and Health, at (202) 586-4096.

Sincerely,

Jill Hruby

Enclosure

Received by the Board 09.26.22

U. S. Department of Energy

Report Addressing Concerns with DOE Use of Transportation Safety Documents (TSDs)

Washington, DC 20585

August 2022

Received by the Board 09.26.22

Background

The Defense Nuclear Facilities Safety Board (Board) sent the Department of Energy (DOE) a letter, dated January 6, 2022, that identified concerns with onsite transportation safety of certain materials at the Los Alamos National Laboratory (LANL) in Los Alamos, New Mexico. The Board's letter resulted from a staff review that identified issues with both the LANL Transportation Safety Document (TSD) and the 10 CFR Part 830, Subpart B, "safe harbor" for developing documented safety analyses (DSAs) for onsite transportation. Title 10 CFR Part 830, Subpart B, requires the development of DSAs and Technical Safety Requirements (TSRs) for Hazard Category 1, 2, and 3 nuclear facilities. It is permissible under the rule to use compliant TSDs as the required DSAs.

Table 1 in Appendix A to Subpart B of 10 CFR Part 830 identifies the following safe harbor methodology for preparing DSAs/TSDs for transportation activities:

- Preparing a Safety Analysis Report for Packaging in accordance with DOE–O–460.1A, *Packaging and Transportation Safety*, October 2, 1996, or successor document; and
- Preparing a Transportation Safety Document in accordance with DOE–G–460.1–1, *Implementation Guide for Use with DOE O 460.1A, Packaging and Transportation Safety*, June 5, 1997, or successor document.

The safe harbor methodology identified for preparing DSAs of onsite transportation activities do not have detailed guidance for meeting several 10 CFR Part 830, Subpart B, requirements.

Discussion

The LANL TSD briefly describes credible accident scenarios with a list of safety controls for each event. The TSD does not, however, contain a safety analysis of the effectiveness of the control set for each specific accident scenario. Instead, the TSD provides generic safety functions for each safety control and a high-level qualitative evaluation of the effectiveness of the entire suite of safety controls, which the TSD refers to as a barrier analysis.

The onsite transportation safe harbor, DOE-G-460.1-1, requires TSDs to demonstrate an equivalent level of safety to Department of Transportation (DOT) and Nuclear Regulatory Commission (NRC) offsite transportation regulations, but does not provide a clear definition of equivalent level of safety. The Board's letter states that the onsite transportation safe harbor does not clearly define what would constitute equivalency to this safety standard. DOE agrees that DOE Order (O) 460.1D, *Hazardous Materials Packaging and Transportation Safety* (2016), DOE Guide (G) 460.1-1, *Implementation Guide for Use with DOE O 460.1A, Packaging and Transportation Safety* (1997), do not clearly define how equivalent safety is achieved. The Board's letter also states that the safe harbor methodology for preparing DSAs for onsite transportation activities identified in 10 CFR Part 830 do not have corresponding requirements or detailed guidance for meeting several 10 CFR Part 830 requirements (e.g., hazard analyses, accident analyses, selection of controls, and TSRs).

NNSA acknowledges the Board's concerns and will baseline LANL TSD controls with the Nevada National Security Site (NNSS) TSD (and possibly other NNSA site TSDs) controls and

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will evaluate whether near-term improvements to the LANL TSD controls can be applied, based on the baseline.

DOE plans to review the requirements of 10 CFR Part 830, Subpart B, and will determine whether an improved methodology and/or guidance for performing 10 CFR Part 830, Subpart B-compliant DSA and TSR development for onsite transportation at DOE defense nuclear facilities is warranted. As needed, DOE will also update the discussion in DOE Standard (STD) 1104-2016, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*, to clarify the expectations for DOE to review and approve TSDs.

The following sections specifically address subjects from the January 6, 2022, DNFSB letter.

1. DOE's perspective on how the LANL TSD meets 10 CFR 830 requirements for adequately analyzing and controlling hazards associated with onsite transportation activities, and whether compensatory measures are warranted to ensure the safety of ongoing onsite transportation activities at LANL.

Title 10 CFR § 830.204(a) requires contractors responsible for a Hazard Category 1, 2, or 3 DOE nuclear facility to obtain approval from DOE for the methodology used to prepare the DSA for the particular facility, unless the contractor uses a methodology set forth in Table 1 of Appendix A to Subpart B of Part 830. Table 1 lists the acceptable methodology for onsite transportation at item number nine: DOE O 460.1A, *Packaging and Transportation Safety*; and DOE G 460.1-1, *Implementation Guide for Use with DOE O 460.1A, Packaging and Transportation Safety.* LANL's TSD follows the methodology of DOE G 460.1-1 to meet the requirements of 10 CFR 830.

Recognizing the opportunity to potentially improve TSD controls, NNSA will baseline the LANL TSD with the TSD at the NNSS and possibly other sites, to see if there are near term enhancements than can be made for the LANL TSD controls.

2. DOE's perspective on how LANL implemented the safe harbor in developing its TSD, compared to other sites which supplemented the onsite transportation safe harbor methodology with more thorough and detailed methodology from DOE Standard 3009.

The DNFSB letter noted that other sites supplement their TSDs with the use of DOE-STD-3009-94. However, the use of STD 3009-94 is not required by 10 CFR Part 830. As previously noted, DOE will review the requirements of 10 CFR Part 830 and determine whether an improved methodology and/or guidance for performing 10 CFR Part 830, Subpart B-compliant DSA and TSR development is warranted for the onsite transportation of certain materials at DOE defense nuclear facilities.

Transportation safety relies on the methodologies referenced in Appendix A to Subpart B of 10 CFR Part 830. However, its implementation is based on site-specific characteristics. Given the differences between site characteristics and operations, it is expected that TSDs will differ from site to site. Ultimately, some of the differences noted that exist in the implementation of transportation safety across the limited sample are likely to reflect the variability in the site-

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specific characteristics and operational environment. Regardless, NNSA may consider the evaluation of the variation between TSDs to determine whether a generic implementation issue exists that might warrant enhancements in NNSA's TSD process.

3. DOE's perspective on the flow down of all applicable 10 CFR 830 requirements into the onsite transportation safe harbors, and whether DOE is considering a revision to the onsite transportation safe harbor directives similar to the revision to DOE Order 461.1.

At every DOE nuclear facility in which 10 CFR Part 830, Subpart B, applies, the regulation's requirements apply regardless of the methodology for DSA development that is used. Consequently, no flow-down is needed. DOE O 460.1D, DOE G 460.1-1, and successor documents are identified in Table 1 of Appendix A, *General Statement of Safety Basis Policy*, within Subpart B of 10 CFR Part 830 as a "safe harbor" methodology for use in preparing documented safety analyses in support of transportation activities. DOE O 460.1D identifies expectations for offsite shipments that must comply with applicable DOT regulations, and it establishes an "equivalent safety" expectation for onsite shipment of radioactive material that do not meet applicable DOT regulations. Non-DOT compliant onsite shipments of radioactive material that equal or exceed Hazard Category (HC) 3 threshold values of material at risk (as defined in DOE STD 1027, *Hazard Categorization of DOE Nuclear Facilities*) must also meet the requirements of 10 CFR Part 830, *Nuclear Safety Management*, Subpart B, *Safety Basis Requirements*.

DOE agrees that DOE O 460.1 and/or supporting guidance, or a successor document, should contain improved methodology to better document analyses of equivalent safety for onsite transportation activities when compared to DOT offsite transportation regulations. DOE will provide better guidance on demonstrating equivalence with DOT requirements.

4. How DOE and NNSA field office personnel evaluate whether the risk of onsite transportation activities is acceptable when approving TSDs, given the requirement to provide equivalent safety to DOT and NRC transportation regulations.

NNSA conducts Biennial Reviews at nuclear sites to review various aspects of 10 CFR Part 830 compliance, including how TSDs are managed, the resource needs, and training and qualification of staff performing the reviews. The Packaging and Transportation area is part of Biennial Reviews and will be used to assess whether the risk of onsite transportation activities is acceptable when approving TSDs (for NNSA sites that use TSDs). Additionally, NNSA will conduct a baseline review of the TSD controls, as discussed in question 1.

DOE's Office of Environmental Management (DOE-EM) evaluates TSD/DSAs as discussed in question 6. When Subpart B applies, the resulting TSD/DSA requires Safety Basis Approval Authority approval prior to implementation, along with the need to develop a TSR and to assess readiness in accordance with DOE O 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities.*

There are differences in how field office personnel evaluate onsite transfers of materials, but these differences are often appropriate, based on the complexity and hazards associated with the broad range of onsite material transfers implemented across the Department.

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5. How the safety requirements and guidance in DOE Standard 1104 apply to TSDs, and if any supplementary guidance or training has been provided for field office personnel responsible for reviewing and approving TSDs.

DOE-STD-1104-2016 principally addresses the preparation of Safety Evaluation Reports (SERs) for DSAs and TSRs that comply with the DOE-STD-3009 safe harbor. There are other potential safe harbors allowed in 10 CFR Part 830. The format of the SER should be based on the safe harbor methodology used. At this time, no supplementary guidance or training specific to TSDs is provided to field office personnel for review and approval of TSDs.

The depth and complexity of a SER should be commensurate with the significance and complexity of the safety basis document being reviewed. Aspects of a DSA that represent unique or novel topics, or where the approach is based on evolving technical issues should be specifically addressed in the SER. A modified SER format may be used for other safety basis documents that are described in Section 6 of DOE-STD-1104 and reflects DOE's expectation that DSAs (including TSDs) and their approvals will be consistent with the approved methodologies used for the DSAs' development. DOE-STD-1104 allows significant flexibility in SER format to be used in evaluating TSDs. DOE will review DOE-STD-1104 to determine whether improvements are warranted.

6. The current level of engagement between headquarters elements responsible for DOE's onsite transportation safe harbors and field office elements responsible for reviewing and approving site TSDs at DOE Environmental Management and NNSA sites.

In Summer 2021, DOE-EM initiated a formal assessment of select contractor onsite TSDs. At the time of the Board's letter, the DOE-EM assessment was not complete, but based on the results at three field elements, onsite transfers of radioactive material were found to be conducted safely. As discussed in issue 4, NNSA uses the Biennial Review process to review field office performance in meeting requirements for the review and approval of TSDs. NNSA is also planning on a baseline assessment of the LANL and NNSS TSD documents, as discussed in the response to issue number 1.

DOE agrees that it needs to provide improved requirements and/or guidance for consistency in TSD/TSR development throughout the DOE defense nuclear facility complex. As always, when Subpart B applies, the resulting DSA/TSD requires Safety Basis Approval Authority approval prior to implementation, along with the need to develop a TSR and to assess readiness in accordance with DOE O 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities*. DOE's Office of Packaging and Transportation and NNSA's Office of Packaging and Transportation are responsible for providing support to field offices, including technical assistance, directives management, and supplemental policy and guidance. After the reviews discussed in this report are completed, DOE and NNSA will identify where improvements can be made. This includes evaluating how we communicate across offices, engage with the field, and share operating experiences across the Department.

Received by the Board 09.26.22