

Joyce L. Connery, Chair  
Thomas A. Summers, Vice Chair  
Patricia L. Lee

**DEFENSE NUCLEAR FACILITIES  
SAFETY BOARD**

Washington, DC 20004-2901



January 2, 2025

The Honorable Jennifer M. Granholm  
Secretary of Energy  
US Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-1000


Dear Secretary Granholm:

The Defense Nuclear Facilities Safety Board (Board) reviews and evaluates the content and implementation of the Department of Energy's (DOE) safety standards (e.g., directives and technical standards) pertaining to DOE's defense nuclear facilities. Additionally, the Board makes safety recommendations to DOE for necessary changes to those safety standards that will help to ensure adequate protection of public health and safety.

In a letter dated December 19, 2023, the Board informed DOE that the Board had selected several safety standards to review in fiscal year (FY) 2024. In determining which DOE safety standards to review in FY 2025, the Board has considered those for which review has begun, those that are planned for revision by DOE, those that have complex-wide effects, and those that establish controls for high-hazard activities. The enclosure provides the list of safety standards that the Board has selected to review in FY 2025 as well as a summary of the safety reviews that the Board conducted in FY 2024.

The Board may elect to add or change reviews of DOE safety directives and technical standards as it deems appropriate. The Board also welcomes DOE's feedback on additional safety directives that warrant the Board's review.

Sincerely,

  
Joyce L. Connery  
Chair

Enclosure

c: Mr. Joe Olencz, Director, Office of the Departmental Representative to the Board

## Enclosure

In fiscal year (FY) 2025, the Board plans to perform safety reviews of the following Department of Energy (DOE) safety standards:

- **DOE Order 420.1**, *Facility Safety* (continued from FY 2024);
- **DOE Order 421.1**, *Nuclear Safety Basis* (continued from FY 2024);
- **DOE Order 433.1**, *Maintenance Management Program for DOE Nuclear Facilities* (continued from FY 2024);
- **DOE Standard 1020**, *Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities* (continued from FY 2024);
- **DOE Standard 1027**, *Hazard Categorization of DOE Nuclear Facilities* (continued from FY 2024);
- **DOE Standard 1104**, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*;
- **DOE Standard 1189**, *Integration of Safety into the Design Process* (continued from FY 2024);
- **DOE Handbook 1220**, *Natural Phenomena Hazards Analysis and Design Handbook for DOE Facilities* (continued from FY 2024);
- **DOE Standard 3006**, *Planning and Conducting Readiness Reviews*;
- **DOE Standard 3009**, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*;
- **DOE Handbook 3010**, *Airborne Release Fractions/Rates and Respirable Fractions for Nonreactor Nuclear Facilities* (continued from FY 2024);
- **DOE Standard 3020**, *Specification for HEPA Filters Used by DOE Contractors* (continued from FY 2024); and
- Guides that DOE revises or replaces as a result of its work on the implementation plan for Recommendation 2020-1 (e.g., **DOE Guide 423.1-1**, *Implementation Guide for Use in Developing Technical Safety Requirements*; **DOE Guide 424.1-1**, *Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements*).

The Board reviewed the following DOE safety standards in FY 2024.

- **DOE Order 151.1, *Comprehensive Emergency Management System***—DOE proposed a revision to its directive that establishes DOE’s emergency management system. Through several iterative versions in 2024, the Board’s staff provided substantial comments to DOE through the DOE’s online review, comment, and approval (RevCom) process for draft DOE directives. After several staff-to-staff meetings to discuss DOE’s responses, the authors of the DOE directive addressed the staff’s comments. The revised directive retains improvements resulting from Board Recommendation 2014-1, *Emergency Preparedness and Response*, and clarifies several previous requirements. DOE issued revised DOE Order 151.1E on October 28, 2024.
- **DOE Order 251.1, *Departmental Directives Program***—This directive establishes the overall directives program at DOE. DOE’s proposed revision to the order removed a considerable amount of guidance and requirements, some of which could diminish the safety measures within DOE directives. In July 2023, the Board’s staff provided significant comments to DOE through the DOE’s RevCom process. The staff met with DOE personnel on several occasions during FY 2024. The Board sent a letter to DOE on January 24, 2024, documenting several safety concerns. DOE responded on March 25, 2024, and briefed the Board on April 10, 2024. DOE issued a revised DOE Order 251.1E, on June 10, 2024, that retained information in the directive that is important to safety.
- **DOE Order 414.1, *Quality Assurance***—In 2022, DOE began major revisions to this directive on quality assurance. The proposed revision removed, replaced, and changed a substantial amount of content in the order, which could diminish safety by modifying specific safety-related requirements within this directive. In July 2023, the Board’s staff provided significant comments to DOE through the DOE’s RevCom process. The Board’s staff met with DOE personnel on several occasions in 2024. DOE has addressed some of safety concerns in the latest version of this directive.
- **DOE Order 420.1, *Facility Safety***—DOE is revising this directive as part of the implementation plan for Recommendation 2020-1, *Nuclear Safety Requirements*. The Board’s staff provided substantive comments in January 2024 on the proposed revision through the DOE’s RevCom process and met with DOE personnel to discuss DOE’s response to the comments. DOE has addressed many of the staff’s safety concerns in the latest draft version of this directive. The staff will continue its review in FY 2025.
- **DOE Order 421.1, *Nuclear Safety Basis***—DOE is developing this new nuclear safety directive as part of DOE’s implementation plan for Recommendation 2020-1. The Board’s staff provided substantive comments in January 2024 on the new directive through the DOE’s RevCom process and met with DOE personnel on many occasions to discuss DOE’s response to the comments. DOE has incorporated many of the staff’s safety suggestions; however, certain staff safety concerns remain. The

Board sent a letter to DOE on November 15, 2024, documenting these safety concerns. The staff will continue this effort in FY 2025.

- **DOE Order 425.1, *Verification of Readiness to Start Up or Restart Nuclear Facilities***—This directive provides requirements governing conduct of readiness reviews and was originally issued in response to Board Recommendation 92-6, *Operational Readiness Reviews*. As part of the DOE’s RevCom process, the Board’s staff provided comments in 2023 on the proposed revision and met with DOE personnel on several occasions to discuss DOE’s response to the comments. The Board’s letter of December 5, 2023, identified remaining safety concerns with the proposed revision and requested DOE to respond to the safety concerns. On June 13, 2024, DOE briefed the Board on its response to the letter. DOE issued revised DOE Order 425.1E on September 25, 2024, and provided its written report to the Board on November 26, 2024.
- **DOE Order 433.1, *Maintenance Management Program for DOE Nuclear Facilities***—The Board’s staff started reviewing this directive in FY 2024 and plans to continue the effort in FY 2025.
- **DOE Order 435.1, *Radioactive Waste Management***—DOE developed this directive in 1999 as part of the implementation plan for Recommendation 1994-2, *Safety Standards for Low-Level Nuclear Waste and Disposal Sites*, along with an accompanying manual, DOE Manual 435.1-1, *Radioactive Waste Management Manual*. In 2022, DOE began revising the order and adding some content from the manual, which is slated for cancellation. The staff met with DOE personnel on several occasions in 2023 and 2024. In February 2024, the Board’s staff provided significant comments to DOE on the proposed revision through the DOE’s RevCom process. DOE has incorporated all the staff’s comments in the latest version of the draft directive.
- **DOE Standard 1020, *Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities***—The Board’s staff reviewed an early draft of the revision to this standard, which provides guidance and requirements on characterizing natural phenomena hazards, such as earthquakes, floods, and volcanic activities, and on design criteria to protect against natural phenomena hazards for DOE nuclear facilities. The staff provided comments to the authors of the DOE standard on several occasions in FY 2024 and will continue this effort in FY 2025.
- **DOE Standard 1027, *Hazard Categorization of DOE Nuclear Facilities***—DOE is revising this standard in accordance with the implementation plan for Board Recommendation 2020-1. The Board’s staff reviewed and provided feedback on an early draft of the revision to the authors of the DOE standard in early FY 2024. The Board’s staff will continue this effort in FY 2025.
- **DOE Standard 1095, *Department of Energy Laboratory Accreditation Program for Personnel Dosimetry***—The Board’s staff reviewed the proposed revision to this

standard, which establishes the technical basis for the Performance Testing Laboratory that administers the external dosimeter program for DOE site dosimetry programs. In April 2024, as part of the DOE's RevCom process, the staff provided suggestions for improvement, some of which were accepted by DOE.

- **DOE Standard 1189, *Integration of Safety into the Design Process***—The Board's staff reviewed an early draft revision to this standard, which provides requirements and guidance to ensure nuclear safety considerations are considered at appropriate times during the design process. The staff has provided comments to the authors of the DOE standard on areas for potential improvements, met with them on several occasions in FY 2024, and will continue this effort in FY 2025.
- **DOE Standard 1212, *Explosives Safety***—The Board's staff reviewed the proposed revision to this standard, which provides the basic technical requirements for an explosives safety program necessary to ensure safe operations. In September 2024, as part of the DOE's RevCom process, the staff provided suggested edits to the standard to clarify and improve certain sections. The National Nuclear Security Administration (NNSA) incorporated most of these suggested edits.
- **DOE Handbook 1220, *Natural Phenomena Hazards Analysis and Design Handbook for DOE Facilities***—DOE has started revising the handbook in conjunction with changes in DOE Standard 1020. The Board's staff plans to review the proposed revision in FY 2025.
- **DOE Handbook 1224, *Hazard and Accident Analysis Handbook***—On February 28, 2024, DOE published revised DOE Handbook 1224-2024, which provides guidance on the development of documented safety analyses for nuclear facilities. As a result of the Board's staff's feedback since 2021, DOE removed inconsistencies with DOE Standard 3009-2014 and improved the technical accuracy in several areas, including plume dispersion and the modeling of explosions.
- **DOE Standard 1234, *Radioactive Material Storage Containers***—This new safety standard on storage containers will supersede DOE Manual 441.1-1, *Nuclear Material Packaging*, which was developed in response to Recommendation 2005-1, *Nuclear Material Packaging*. The Board's staff provided comments to DOE in 2023 through the DOE's RevCom process. DOE incorporated all the suggestions into the draft standard in 2024.
- **DOE Standard 1239, *Chemical Safety Management Program***—This draft DOE standard provides expectations and guidance for managing chemical safety at DOE sites and facilities. The Board's staff sent comments to DOE in 2023 through the DOE's RevCom process. DOE incorporated the staff's key suggestions into the draft standard in 2024.
- **DOE Handbook 1545, *Seismic Evaluation Procedure for Equipment in U.S. Department of Energy Facilities***—This proposed handbook is based on

DOE/EH-0545, which provides safety guidance for seismic evaluations of equipment in DOE facilities. The Board's staff provided comments to DOE in 2023 through the DOE's RevCom process and additional comments in 2024. DOE is considering the comments it received on this handbook.

- **DOE Standard 1628, *Development of Probabilistic Risk Assessments for Nuclear Safety Applications***—Consistent with the implementation plan for Recommendation 2009-1, *Risk Assessment Methodologies at Defense Nuclear Facilities*, DOE issued this standard in 2013. In the fourth quarter of FY 2024, DOE proposed changes to this standard, and the Board's staff provided comments through the DOE's RevCom process for DOE's consideration.
- **DOE Standard 3006, *Planning and Conducting Readiness Reviews***—After issuing DOE Order 425.1E in September 2024, DOE has started making changes to this safety standard, which provides methods and approaches for planning and conducting readiness reviews. The Board's staff plans to review the proposed revision in FY 2025.
- **DOE Handbook 3010, *Airborne Release Fractions/Rates and Respirable Fractions for Nonreactor Nuclear Facilities***—In 2021, DOE proposed revisions to portions of this safety handbook on airborne release fractions and respirable fraction experimental data. As part of the DOE's RevCom process, the Board's staff provided comments to DOE in 2021 and met with DOE personnel on several occasions in 2024 to discuss the comments. The staff will continue this effort in FY 2025.
- **DOE Standard 3013, *Stabilization, Packaging and Storage of Plutonium-Bearing Materials***—DOE is revising this standard, which provides guidance for the stabilization, packaging, and safe storage of plutonium-bearing materials. The Board's staff provided comments on the proposed revision in March 2024 through the DOE's RevCom process. After several staff-to-staff meetings to discuss the comments, the authors of the DOE standard agreed to incorporate the staff's suggestions.
- **NNSA Supplemental Directive 226.2, *Chief of Defense Nuclear Safety (CDNS) Review of Nuclear Safety Oversight Performance***—In September 2024, the Board's staff reviewed this supplemental directive, which establishes the requirements, processes, and procedures for conducting CDNS reviews of nuclear safety oversight performance. The staff provided comments to NNSA through the NNSA's RevCom process.
- **NNSA Supplemental Directive 251.1, *Directives Management***—The Board's staff provided comments to NNSA in November 2023 through the NNSA's RevCom process on the proposed revision to this supplemental directive, and met with NNSA personnel in February 2024, to discuss the comments. NNSA issued revised NNSA Supplemental Directive 251.1C on December 16, 2024, that incorporated the staff

comments, which will improve communications during the review and comment process when NNSA directives are developed or revised.

- **NNSA Supplemental Directive 452.2, *Nuclear Explosives Safety Evaluation Processes***—In September 2024, the Board’s staff reviewed proposed changes to this supplemental directive, which provides requirements and guidance for conducting nuclear explosive safety evaluations. Through the NNSA’s RevCom process, the staff provided comments to NNSA to clarify certain sections and address potential safety concerns introduced by the proposed changes. NNSA incorporated most of these suggested edits.