U.S. DEPARTMENT OF ENERGY

# Department of Energy Activities Relating to the Defense Nuclear Facilities Safety Board

# Fiscal Year 2024

**Report to Congress**

**December 2025**

**United States Department of Energy**
**Washington, DC 20585**

# Message from the Secretary

Following is the U.S. Department of Energy's (Department or DOE), including the National Nuclear Security Administration, Fiscal Year 2024 annual report to Congress addressing the activities related to the Defense Nuclear Facilities Safety Board (DNFSB or Board) and status of Implementation Plans in response to accepted Board recommendations, as required by Section 316(b) of the Atomic Energy Act of 1954, as amended (AEA), codified at 42 United States Code (USC) §2286e(b) and Section 315(g)(1) of the AEA, codified at 42 USC § 2286d(g)(1).

The Board provides analysis, advice, and recommendations to the Secretary of Energy regarding the safety of the Department's defense nuclear facilities. DOE as regulator and owner, ensures to provide reasonable assurance of adequate protection of the DOE workforce and the public from operations conducted at the Department's defense nuclear facilities.

Pursuant to statutory requirements, this report is being provided to the following members of Congress:

- **The Honorable Susan Collins**
  Chair, Senate Committee on Appropriations

- **The Honorable Patty Murray**
  Vice Chair, Senate Committee on Appropriations

- **The Honorable Roger Wicker**
  Chairman, Senate Committee on Armed Services

- **The Honorable Jack Reed**
  Ranking Member, Senate Committee on Armed Services

- **The Honorable Mike Lee**
  Chairman, Senate Committee on Energy and Natural Resources

- **The Honorable Martin Heinrich**
  Ranking Member, Senate Committee on Energy and Natural Resources

- **The Honorable Tom Cole**
  Chairman, House Committee on Appropriations

- **The Honorable Rosa DeLauro**
  Ranking Member, House Committee on Appropriations

- **The Honorable Mike Rogers**
  Chairman, House Committee on Armed Services

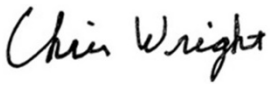
- **The Honorable Adam Smith**
  Ranking Member, House Committee on Armed Services

- **The Honorable Brett Guthrie**
  Chairman, House Committee on Energy and Commerce

- **The Honorable Frank Pallone, Jr.**
  Ranking Member, House Committee on Energy and Commerce

If you have any questions regarding the information in this report, please contact Ms. Megan Roessing, Deputy Director for External Coordination, Office of the Chief Financial Officer, at (202) 586-3128; Mr. Scott Marks, Deputy Assistant Secretary for Senate Affairs, or Mr. Michael Inguanta, Deputy Assistant Secretary for House Affairs, Office of Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,



Chris Wright
Secretary of Energy

# Executive Summary

This is the U.S. Department of Energy's (Department or DOE), including the National Nuclear Security Administration (NNSA), annual report to Congress[1] regarding the Department's Fiscal Year (FY) 2024 activities related to the Defense Nuclear Facilities Safety Board (DNFSB or Board) and status of Implementation Plans (IPs) in response to accepted Board recommendations.[2]

It is the policy of DOE to provide reasonable assurance of adequate protection and safety of workers, the public, and the environment during the design, construction, operation, and decommissioning of its defense nuclear facilities (DNFs). This policy is implemented through the Department's nuclear and worker safety programs, which are comprised of a robust regulatory framework and multi-layered oversight by DOE line management and headquarters organizations. DNFSB, an independent executive branch agency established by Congress in 1988, provides analysis, advice, and recommendations to the Secretary of Energy regarding safety at DOE DNFs.

In addition to supporting Board visits to DOE sites, in FY 2024, DOE:

- Provided 3,006 documents to the DNFSB in response to 267 requests for information.
- Participated in 20 meetings or briefings with the Board.
- Completed responses to 19 of 28 Board reporting requirements.

Additional information regarding these and other interactions is detailed within the report.

As of the end of FY 2024, the status of open DOE IPs developed in response to accepted Board recommendations is as follows:

- Recommendation 2019-1, *Uncontrolled Hazard Scenarios and 10 CFR 830 Implementation at the Pantex Plant*. In January 2024, NNSA notified the Board that all 69 actions associated with the IP were completed. On June 3, 2024, the Board issued a letter acknowledging that the FY 2024 annual status briefing was no longer required and added a reporting requirement for a briefing associated with the results of the IP effectiveness review.
- Recommendation 2020-1, *Nuclear Safety Requirements*. The IP contains 17 milestones, seven of which were completed prior to FY 2024, and four of which were completed in FY 2024. The remaining six items are on schedule to be completed as identified in the IP.
- Recommendation 2023-1, *Onsite Transportation Safety*. Issued on January 26, 2024, and accepted by DOE on May 3, 2024. The IP was still being developed at the end of FY 2024.

[1] In accordance with Section 316(b) of the Atomic Energy Act (AEA) of 1954, as amended, codified at 42 United States Code (USC) § 2286e(b).

[2] In accordance with Section 315(g)(1) of the AEA, codified at 42 USC § 2286d(g)(1).

# DEPARTMENT OF ENERGY ACTIVITIES RELATING TO THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD

# FISCAL YEAR 2024

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# I. Legislative Language

This report is being provided to Congress in accordance with Section 316(b) of the Atomic Energy Act (AEA) of 1954, as amended, codified at 42 United States Code (USC) § 2286e(b):

> *DOE REPORT. The Secretary of Energy shall submit to the Committees on Armed Services, Appropriations, and Energy and Commerce of the House of Representatives and the Committees on Armed Services, Appropriations, and Energy and Natural Resources of the Senate each year, at the same time that the President submits the budget to Congress pursuant to section 1105(a) of Title 31 [United States Code], a written report concerning the activities of the Department of Energy under this subchapter, including all recommendations made by the Board, during the year preceding the year in which the report is submitted.*

This report also addresses Section 315(g)(1) of the AEA, codified at 42 USC § 2286d(g)(1), which states:

> *Subject to paragraph (2), not later than one year after the date on which the Secretary of Energy transmits an implementation plan with respect to a recommendation (or part thereof) under subsection (f), the Secretary of Energy shall carry out and complete the implementation plan. If complete implementation of the plan takes more than 1 year, the Secretary of Energy shall submit a report to the Committees on Armed Services, Appropriations, and Energy and Commerce of the House of Representatives and the Committees on Armed Services, Appropriations, and Energy and Natural Resources of the Senate setting forth the reasons for the delay and when implementation will be completed.*

# II. Introduction

This report contains information regarding fiscal year (FY) 2024 activities between the U.S. Department of Energy (Department or DOE), including the National Nuclear Security Administration (NNSA or NA), and the Defense Nuclear Facilities Safety Board (DNFSB or Board), regarding safety-related initiatives and activities at DOE defense nuclear facilities (DNFs), and the status of open DOE implementation plans (IPs) developed in response to DNFSB recommendations accepted by the Secretary of Energy (Secretary).

Section 318 of AEA, codified at 42 USC § 2286g, defines a DNF as:

(1) A production facility or utilization facility (as defined in 42 USC §2014 [§ 11 of the AEA]) that is under the control or jurisdiction of the Secretary of Energy and that is operated for national security purposes, but the term does not include:

   (a) Any facility or activity covered by Executive Order No. 12344, dated February 1, 1982 [50 USC § 2511 note], pertaining to the Naval nuclear propulsion program;

   (b) Any facility or activity involved with the transportation of nuclear explosives or nuclear material;

(c) Any facility that does not conduct atomic energy defense activities; or

(d) Any facility owned by the United States Enrichment Corporation.

(2) A nuclear waste storage facility under the control or jurisdiction of the Secretary of Energy, but the term does not include a facility developed pursuant to the Nuclear Waste Policy Act of 1982 (42 USC 10101 et seq.) and licensed by the Nuclear Regulatory Commission.

**DOE Sites with Defense Nuclear Facilities**

| Site Name | Acronym or Abbreviation | Location | DOE Program Office Responsible for DNFs* |
|---|---|---|---|
| Hanford Site | Hanford | Washington | EM, SC |
| Idaho Cleanup Project | ICP | Idaho | EM |
| Lawrence Livermore National Laboratory | LLNL | California | NA |
| Los Alamos National Laboratory | LANL | New Mexico | NA, EM |
| Nevada National Security Site | NNSS | Nevada | NA, EM |
| Oak Ridge Office of Environmental Management | OREM | Tennessee | EM |
| Pantex Plant | Pantex | Texas | NA |
| Sandia National Laboratories – New Mexico | SNL-NM | New Mexico | NA |
| Savannah River Site | SRS | South Carolina | NA, EM |
| Waste Isolation Pilot Plant | WIPP | New Mexico | EM |
| Y-12 National Security Complex | Y-12 | Tennessee | NA |

* EM = Office of Environmental Management; NA = National Nuclear Security Administration; SC = Office of Science

It is DOE policy to provide reasonable assurance of adequate protection and safety of workers, the public, and the environment during the design, construction, operation, and decommission of its DNFs. The Department protects its workers, the public, and the environment from hazards associated with its DNFs through rigorous and proactive nuclear and worker safety programs. These programs are comprised of a robust regulatory framework of Federal Regulations, DOE directives (i.e., Notices, Policies, Orders, Manuals, and Guides) and technical standards, and multi-layered oversight by DOE line management, management and operating contractors, federally managed field and headquarters Program Offices, the DOE Office of Environment, Health, Safety, and Security (EHSS), the DOE Office of Enterprise Assessments (EA), and DOE Central Technical Authorities.

DNFSB, an independent executive branch agency established by Congress in 1988, provides advice and recommendations to the Secretary regarding the status and implementation of DOE safety programs designed to provide protection of workers and the public from operations conducted at DOE DNFs. The Board and the Department communicate and interact through a variety of mechanisms, including Board recommendations, reporting requirements, informational letters, public meetings, public hearings, briefings, discussions, and site visits.

DNFSB:

- Reviews and evaluates the content and implementation of DOE standards and directives relating to the design, construction, operation, and decommissioning of DOE DNFs.
- Performs analyses of design and operational data from DOE DNFs.
- Performs investigations of safety-related practices, incidents, and accidents at DOE DNFs.
- Reviews the design and construction of new DOE DNFs.
- Makes recommendations regarding safety at DOE DNFs.

Within DOE, interactions with DNFSB are governed by DOE Order (O) 140.1A, *Interface with the Defense Nuclear Facilities Safety Board*, issued June 15, 2020, that emphasizes DOE line management accountability and establishes clear requirements and responsibilities for DOE Federal and contractor staff when communicating and/or interfacing with DNFSB. Additional information regarding Departmental interactions with DNFSB is available at: https://ehss.energy.gov/deprep/.

# III. Departmental Activities Related to the DNFSB

This section provides information regarding notable activities between DOE and DNFSB and other information related to safety at DOE DNFs. This section also provides information regarding responses to Board requests for information, general topics of interest to DNFSB, meetings and briefings between the two agencies, and the status of reporting requirements.

## A. Departmental Activities

Facility Maintenance – Aging Infrastructure Management

In December 2023, factual accuracy discussions were conducted between DOE and DNFSB regarding the DNFSB Aging Infrastructure Management Review at Hanford, LANL, Pantex, SRS, and Y-12, initiated in May 2022. The review was still ongoing at the end of FY 2024.

DOE Safety Software Central Registry

On October 4, 2023, DOE provided a briefing to the Board regarding the DOE Safety Software Central Registry in response to an August 24, 2022, letter to the Secretary.

Revision of DOE O 425.1D, Verification of Readiness to Start Up or Restart Nuclear Facilities

On December 5, 2023, the Board sent a letter to the Secretary with a reporting requirement for a briefing and written response regarding the revision of DOE O 425.1D that allows up to an 18-month facility shutdown without restart readiness reviews and allows parallel contractor and DOE readiness reviews. DOE provided the briefing on June 13, 2024, and worked with the Board to address its concerns. The final order was issued on September 25, 2024. The written response to the Board was still under development at the end of FY 2024.

## B. Program Office Activities

This section describes Program Offices' safety-related initiatives and activities at DOE defense

nuclear facilities (DNFs). Progress in these activities are communicated to DNFSB through a variety of mechanisms, including briefings, discussions, and site visits.

Office of Environmental Management (EM)

Programmatic Safety Activities

In FY 2024, the EM Office of Safety, Security and Quality Assurance and the EM Office of the Chief of Nuclear Safety continued to perform oversight, provide technical support, and execute technical activities, as appropriate, in support of EM operations at DNFs. Specific activities of interest to DNFSB included:

- Conducting training on the revised DOE-Standard (STD)-5506-2021, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities* (see additional detail below).
    - EM conducted training on the revised standard at SRS in January 2024 and OREM in February and August 2024. Classes were well attended by all Program Offices, EHSS, and DNFSB; a total of 134 people attended the training.
    - Assisting sites and other program offices with implementation of DOE-STD-5506-2021, as requested.
- Supporting an independent review of the Hanford Advanced Modular Pretreatment System Project to ensure early integration of safety into the design process.
- Preparing for the start-ups of the Hanford Direct Feed Low Activity Waste and Capsule Storage Area and the WIPP Safety Significant Confinement Ventilation System.
- Continuing to focus on practices managing aging infrastructure to ensure facilities and structures, systems, and components perform their safety functions.
    - Continuing to assess aging infrastructure by hosting site specific infrastructure deep dive reviews that allow EM to assess infrastructure needs and to assist other Program Office prioritization, support, and funding. WIPP is scheduled to host a deep dive in FY 2025.
- Continuing to evaluate incorporating DOE Manual 435.1-1, *Radioactive Waste Management*, into the associated Order.

National Nuclear Security Administration (NA)

Programmatic Safety Activities

In FY 2024, NNSA provided technical expertise to support operational excellence, promote a performance culture, and enhance safety at its DNFs. Notable safety-related activities of interest to DNFSB included:

- Formation of a Safety Staffing Solutions Integrated Project Team to implement recommendations that were developed to improve NNSA's recruitment, development, and retention of safety personnel. This initiative leverages innovative thinking on how NNSA can best utilize shared resources and matrixed support to create cohorts, facilitate

mentoring, streamline training, and provide an enduring knowledge platform across the safety community.

- Co-leading the DOE Subterranean Safety Committee, established to facilitate discussion and address safety challenges pertaining to subterranean operations.
- Increased emphasis on operational awareness through issuance of the NNSA Technical Bulletin, safety-related NNSA Connect Messages, and OPEXShare entries across DOE and NNSA.
- Hosting of bi-monthly operations and safety conference calls with Field Offices to provide a forum for discussion of current events and challenges, sharing of lessons learned and best practices, and communication of NNSA-wide concerns and initiatives.

**C. Site-Specific Activities**

Hanford Site

Waste Treatment and Immobilization Plant

In FY 2024, commissioning activities for the Low Activity Waste (LAW) Facility, Balance of Facilities, and Analytical Laboratory, collectively known as the Direct-Feed Low-Activity Waste Facilities continued. These facilities support feeding Hanford Tank Farms liquid waste directly to the LAW Facility to create a stable waste form for disposal. Melter 2 heat-up was conducted in FY 2024. During FY 2024 DNFSB conducted maintenance, conduct of operations and configuration management reviews of the LAW Facility.

In FY 2024, implementation of DOE-STD-1189-2016, *Integration of Safety into the Design Process*, was initiated to include the creation and approval of a Safety Design Strategy to guide integration of safety into the ongoing design of the High-Level Waste facility.

Central Waste Complex

In FY 2024, issues regarding an ongoing update to the DSA and Technical Safety Requirement (TSR), identified in a November 16, 2021, Board letter, continued to be addressed. The letter documented the results of the DNFSB November 2020 safety basis review of the Central Waste Complex and identified several weaknesses and areas for improvement in the DSA and TSR documents.

The Central Waste Complex safety basis documents are part of the Solid Waste Operations Complex safety basis. As part of the DSA and TSRs update, the T Plant Complex is receiving a stand-alone safety basis document set. The Waste Receiving and Processing Facility is being downgraded to a Below Hazard Category 3 facility and is scheduled to be removed from the Central Waste Complex safety basis.

242-A Evaporator Facility

On March 6 and September 11, 2024, DOE briefed the Board regarding concerns related to (1) a fire-related vulnerability of safety-significant solenoid valves located in the condenser room, and (2) the adequacy of programmatic administrative controls for seismic shutdown, as required in a June 27, 2023, Board letter.

Idaho Cleanup Project (ICP)

In FY 2024 DOE continued to interact with DNFSB staff regarding the following activities at the site.

DOE-STD-5506-2021, Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities, Implementation

In FY 2024, a phased plan for implementation of DOE-STD-5506-2021 was developed. Phase 1 is scheduled to begin in FY 2025 and includes updates and documentation of statistical material at risk, performing fire hazard analysis for appliable scenarios, and revising various applicable documents for the Advanced Mixed Waste Treatment Plant.

Integrated Waste Treatment Unit

In October 2023, the Integrated Waste Treatment Unit entered a shutdown period based on indications that the granular activated carbon bed media was saturated with mercury. After replacement of the bed media, start-up/heat-up and conditioning operations began in late February 2024. During start-up, indications of excess solids bypassing the process gas filter were identified prompting a shutdown of operations. Following replacement of all filter elements, processing of radioactive liquid sodium bearing waste resumed on August 29, 2024. Over 100,000 gallons of waste was processed in FY 2024.

Accelerated Retrieval Projects

In FY 2024, decontamination and demolition of Accelerated Retrieval Projects II, VII, VIII, and IX located at the Subsurface Disposal Area was completed.

BN510 Drums

In FY 2024, shipments of 2020 and newer BN510 drums to WIPP continued. BN510 drums older than 2020 are scheduled to be repackaged in standard waste boxes for future shipments to WIPP. In FY 2025, it is planned to explore the use of drum ultrasonic testing to validate drum integrity in lieu of overpacking.

Calcine Disposition Project

In the fourth quarter of FY 2024, the Calcine Disposition Project Critical Decision-0, *Approve Mission Need* (Revised) (CD-0R) was approved aligning the project with current cost and schedule projections.

Technology validation studies assessing vitrification technology applicability to calcine high-level waste continued in FY 2024 and are scheduled to be completed in FY 2025. The studies support development of conceptual designs for an eventual recommendation of an alternative selection at CD-1, *Approve Alternative Selection*, projected in FY 2030.

The accomplishments in FY 2024 directly support the renegotiated milestones of the Idaho National Laboratory (and ICP) Consent Order in which DOE is required to develop and implement treatment capacities and technologies to meet Resource Conservation and Recovery Act land disposal restrictions for all covered mixed wastes currently in storage and to be generated or received in the future.

Los Alamos National Laboratory

Plutonium Facility–Building 4 (PF-4) (NA)

- Documented Safety Analysis

In FY 2024, DOE provided DNFSB a draft PF-4 DSA prepared in accordance with DOE STD 3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis,* for review and comment. The NNSA Safety Basis Review Team reviewed and incorporated, as appropriate, DNFSB feedback and input from the Office of Enterprise Assessments. The DSA is anticipated to be submitted for final approval in FY 2025.

- Ventilation System

On November 20, 2023, the NNSA Administrator (NA-1) provided the Board detailed information on the PF-4 safety systems that provide protection to public, workers, and environment in response to a June 6, 2023, Board letter. The information included detailed facility equipment information and the strategy to replace older components with more robust components. NNSA and LANL conducted follow-up discussions with DNFSB regarding the safety systems.

- Chemical Compatibility

In January 2024, the Board transmitted a letter to the Secretary concluding that LANL's development of a formal program to evaluate the chemical compatibility of radioactive waste and its plans to upgrade safety bases to implement DOE STD 5506-2021 are important steps toward improving the safety posture at both LANL and WIPP. NNSA and LANL acted upon information in the letter, such as integrating the chemical compatibility evaluation process into the draft PF-4 DSA, ensuring appropriate controls are implemented, and initiating a process to ensure changes to commercially available products undergo a chemical compatibility evaluation.

Glovebox Integrity Review (NA)

On April 10, 2024, the Board issued a letter to the Secretary with a requirement for a briefing to address LANL glovebox safety issues and NNSA's plans for disseminating lessons-learned from the glovebox loss of integrity events investigated at LANL. NNSA and LANL briefed the Board on August 6, 2024.

Technical Area 21 (EM)

In September 2024, the DSA Implementation Verification Reviews for Building 257 and Industrial Waste Lines at Technical Area 21 were approved. Full implementation of the DSAs and TSRs was declared on September 25, 2024.

Technical Area 54, Area G (EM)

In FY 2024, DOE continued to proactively communicate with DNFSB regarding Area G activities. Fourteen shipments of TRU waste were sent to WIPP.

Retrieval of 158 corrugated metal pipes and reduction of 67 percent of those pipes was completed In FY 2024.

In July 2024, a draft DSA/TSR was submitted for review and approval. The Safety Basis Review Team is conducting a final review of the document and is scheduled to release a Safety Evaluation Report in early FY 2025. EM-LA has routinely been engaged with the progress being made with safety management programs, facility modifications, procedures, and training. A meeting to discuss the DNFSB staff review of the Area G DSA/TSR is planned for early FY 2025.

Remediated Nitrate Salt TRU Waste Stored at Waste Control Specialists, LLC (EM)

In FY 2024, work continued in the development of a path forward for the permanent disposition of LANL-generated TRU waste currently being stored at the Waste Control Specialists, LLC facility in Texas. The Board was involved in meetings and discussions and has maintained cognizance. A decision on the final disposition of the waste had not been made by the end of FY 2024.

Nevada National Security Site

Device Assembly Facility

- Lithium-Ion Battery Uninterruptable Power Supply

On August 13, 2024, the Board issued a letter to the Secretary with a reporting requirement for a written response and briefing regarding identified safety issues associated with the use of lithium-ion batteries at DOE DNF's and specifically at the Device Assembly Facility. In FY 2024, the Board completed its safety review of the new lithium-ion battery uninterruptable power supply at the Device Assembly Facility. The Board concluded that DOE had not issued requirements nor provided guidance to assess the hazards and identify safety controls necessary for the use of lithium-ion energy storage systems in general; and identified specific safety concerns with the new Device Assembly Facility uninterrupted power supply. The response and briefing were still under development at the end of FY 2024.

- National Criticality Experiments Research Center (NCERC)

In FY 2024, improvements continued to be implemented that address concerns contained in a June 16, 2022, Board letter to the Secretary regarding the NCERC nuclear criticality safety program. All corrective actions and observations regarding implementation of criticality safety controls except one have been addressed. The final corrective action is scheduled to be completed in early FY 2025.

- Documented Safety Analysis

In FY 2024, the DSA Rewrite Project and associated draft safety basis documentation review continued to be a primary focus of the DNFSB. Interactions with DNFSB continued throughout the year to address comment resolution. Specifically, the project is continuing to clarify and address existing issues, while also addressing emerging programmatic needs and scope changes. The project is now scheduled to be completed in FY 2025.

- Fire Suppression System Water Tank

Repair of the fire suppression system water tank was completed in August 2024 and the system returned to normal operation. A December 2022 inspection revealed a greater than expected corrosion of the tank interior, and a Justification for Continued Operations identifying two

general service water tanks as alternate sources for the fire suppression system was implemented while the fire system water tank was repaired.

- Seismic Evaluations

In FY 2024, the building evaluations for the revised seismic accelerations were completed. Multiple buildings were found to not meet current code requirements. On February 28, 2024, a potential inadequacy of the safety analysis was declared. No restrictions on operations were deemed necessary.

PULSE Facility (formerly U1a Complex)

On July 25, 2024, the Board issued a letter to the Secretary with reporting requirements for a report and briefing that address identified safety-related questions pertaining to the PULSE Facility design and operations. The report and briefing were still under development at the end of FY 2024.

In FY 2024, mining and liner installation were completed for an 8-foot diameter borehole that will provide a path for utilities from the surface. Installation of the utilities will continue through FY 2025.

Underground mining and construction operations continue for the Z-Pinch Experimental Underground System Test Bed Facility Infrastructure Project as well as for the PULSE Facility Enhancement Project. Mining is scheduled to be completed in FY 2025 for both projects.

Construction of a new refuge station to support the west side of the facility was initiated in FY 2024. Completion is expected in FY 2026.

A fire detection and alarm system for the .01 Drift is expected to be completed in FY 2025. Construction of a fire detection and alarm system for the .02 Drift is scheduled to begin in FY 2025.

Design of upgrades to surface fans, A-Fan and G-Fan, were completed in FY 2024. New redundant fan installation is scheduled for FY 2025.

In FY 2024, the design subcontract was awarded in support of the hoist programmable logic controller replacement. Work is expected to be completed in FY 2025.

Oak Ridge Office of Environmental Management

TRU Waste Processing Center

During FY 2024, the inventory of TRU waste continued to be safely and systematically reduced. DNFSB personnel routinely visited and observed operations in FY 2024; and in January 2024, the Chair of the DNFSB visited the site.

In FY 2024, 12 TRU waste shipments to WIPP, four low-level waste shipments to NNSS, and three mixed low-level waste shipments to Energy Solutions, Inc. were completed. In addition, three of the final seven boxes of Nuclear Fuel Services soils for remediation were processed and dispositioned; and processing of cellulosic waste was initiated.

Uranium-233 Project

During FY 2024, Uranium-233 Project material continued to be safely managed, stored, and dispositioned. DNFSB personnel routinely visited and observed operations in FY 2024; and in January 2024, the Chair of the DNFSB visited the site.

The Initial Processing Campaign continued processing waste in FY 2024. A total of 84 canisters in the hot cells were processed, approximately 10 grams of thorium have been processed and shipped for beneficial use, and 8 debris tanks of solidified U-233 have been shipped off site for final disposition. Radio-Chemical Process canisters are scheduled to be processed in FY 2025.

Several safety basis document revisions were made in FY 2024 to address the utilization of storage areas, canister carriers, and transport overpacks, as well as oxide processing.

Pantex Plant

In April 2024, the Board visited Pantex to tour the site and participate in site management discussions on conduct of operations, Field Office separation, contractor transition, current and upcoming production schedules, pit repackaging, safety basis improvement initiatives, dosimetry program status, and aging infrastructure.

Safety Basis Improvements

In January 2024, DOE notified the Board that all actions associated with the IP for Recommendation 2019-1, *Uncontrolled Hazard Scenarios and 10 CFR 830 Implementation at the Pantex Plant* were completed. On June 3,2024, the Board issued a letter to the Secretary alleviating the requirement for the associated FY 2024 annual status briefing and requesting a briefing on the results of NNSA's IP implementation effectiveness review and an updated schedule of completing the modernization of DSA documents, as described in the Pantex Safety Basis Vison Execution Strategy. The revised DSA modernization schedule was provided to DNFSB on August 10, 2024. The IP effectiveness review was still ongoing at the end of FY 2024.

In FY 2024, Pantex updated the B61 Hazard Analysis Report and in February 2024 DNFSB initiated an onsite review of the updated report. The DNFSB review was still ongoing at the end of FY 2024.

In FY 2024, an alternate methodology was developed for maintaining Pantex DSAs to meet Title 10 of the Code of Federal Regulations 830 (10 CFR 830), *Nuclear Safety Management*, requirements. DNFSB initiated an onsite review of the alternate methodology in December 2023. At the end of FY 2024, this review was still ongoing. In April 2024, Pantex provided DNFSB with the version of the alternate methodology that was submitted to NNSA for approval. The NNSA Cognizant Secretarial Officer was reviewing the alternate methodology for approval at the end of FY 2024.

Fire Protection

In February 2024, the Board issued a letter to NA-1 with no reporting requirements regarding the results of a comprehensive review of various aspects of Pantex fire protection initiated in September 2021. The letter contained several opportunities for improvement.

Probabilistic Seismic Hazard Analysis

In December 2023, DNFSB provided Pantex with close-out notes of the Board's review of the Pantex 10-Year Probabilistic Seismic Hazard Analysis report completed in September 2022. No follow-up discussion was necessary, and the Board did not issue formal correspondence.

12-44-5 Ceiling Replacement Construction

In April 2024, the Board issued a letter to the Secretary with no reporting requirements regarding the ceiling replacement in Building 12-44 Cell 5 to remove combustible material (wood) completed in September 2022. DNFSB conducted oversight of the construction activities and reviewed the final quality submittal package. The letter did not identify any major concerns but did include some areas for improvement.

Savannah River Site

Contract Transition

During FY 2024, details for transfer primary authority, accountability, and site stewardship responsibility for SRS from the EM Savannah River Operations Office to the NNSA Savannah River Field Office were finalized. DNFSB staff were appropriately engaged. The transition was deemed necessary given the steadily increasing NNSA mission requirements at SRS and the concurrent progression of the EM clean-up mission toward a defined end-state. All activities were completed to support NNSA assumption of primary site management responsibility and budget authority by October 1, 2024 (FY 2025).

Conduct of Operations (EM)

In FY 2024, corrective actions continued to be implemented, and management attention provided to improve Conduct of Operations. There was one TSR violation in FY 2024, compared to three in FY 2023. Corrective actions are in progress and compensatory measures were implemented with oversight from EM. The Conduct of Operations Excellence Plan is being fully implemented to continue focus on front-line manager performance, continued training enhancements, and formalized independent assessments. The two experienced Conduct of Operations coaches hired in FY 2023 continued to assist with improvement of overall conduct of operations performance.

Savannah River National Laboratory – Safety Basis (EM)

In FY 2024, activities to align the laboratory's nuclear safety program documentation with DOE-STD-1186, *Specific Administrative Controls*, continued in response to the April 5, 2023, DNFSB final report regarding a review of the laboratory DSA and TSR. The report identified a concern with the use of Programmatic Administrative Controls where Specific Administrative Controls are warranted. Compliance with DOE-STD-1186 is scheduled to be fully implemented by FY 2028.

Building 235-F (EM)

On August 13, 2024, DOE transmitted a report to the DNFSB and on August 15, 2024, DOE conducted an annual briefing with the DNFSB regarding five topic areas related to the decommissioning of Building 235-F, as required in a November 2, 2021, Board letter.

Building 235-F decommissioning is scheduled to be initiated in FY 2027 with in-situ grouting and installation of an engineered roof as the regulatory approved end state. The decommissioning is scheduled to be completed in FY 2030.

Liquid Waste Operations (EM)

In FY 2024, a strategy of more aggressive risk reduction measure resulted in the Salt Waste Processing Facility, Defense Waste Processing Facility, and Saltstone Disposal Facility collectively processing and stabilizing over 11.5 million curies of radioactive waste from the tank farms and into inherently safe glass and grout, a 25 percent increase over the previous FY.

In FY 2024, EM received concurrence from state and Federal regulators that Tank 10 achieved Preliminary Cease Waste Removal status and could proceed to the next step in the closure process, achieving a Federal Facility Agreement milestone 7 months ahead of schedule.

The Defense Waste Processing Facility produced and leak-checked 40 canisters during FY 2024. In addition, canister storage capacity was increased by completing the addition of another 2,262 storage locations via double-stack modifications in Glass Waste Storage Building #1.

The Saltstone Disposal Facility processed 4.4 million gallons of low-level waste into grout while consolidating control rooms and adding a second shift capability in anticipation of higher production from the Salt Waste Processing Facility.

The Salt Waste Processing Facility processed 2.8 million gallons of waste from the tank farms while undertaking several improvement initiatives such as: procuring larger, higher capacity crossflow filters (scheduled to be installed in FY 2025), optimizing monosodium titanate, improving mercury analytical capabilities, and adding lab-scale filtration testing capability to improve overall operations.

Savannah River Plutonium Processing Facility (NA)

On January 18, 2024, DOE provided a report, and on February 21, 2024, provided a briefing to the Board in response to the August 3, 2023, Board letter regarding DOE's position on the adequacy of the safety strategy for facility worker protection, focusing on impacts to long-lead procurements, such as glovebox systems at the Plutonium Processing Facility.

During FY 2024, DOE performed a reanalysis of the facility's safety basis to address facility worker safety issues noted by DNFSB and DOE. The reanalysis resulted in the adoption of additional safety significant controls to enhance facility worker safety.

Tritium Facilities (NA)

On December 22, 2023, the combined Tritium Facilities DSA and TSR, Revision 1, which conservatively assumes the 296-H Stack fails, was approved. Revision 1 also conservatively assumes that the 217-H Vault structure does not survive the stack collapse scenarios. The revisions allow the facilities to continue to operate as currently configured with no additional controls required. However, potential controls for these postulated scenarios are being evaluated.

On July 3, 2024, a reevaluation of the potential inadequacy of the safety analysis related to the 2022 unplanned release of tritium was initiated. As a result of the evaluation, the facility was

approved to continue to operate with no additional restrictions with the expectation to continue efforts to identify and refine appropriate methods to evaluate the potential consequences of tritium re-entry to workers, as well as updating the Consolidated Hazards Analyses and supporting documents as appropriate.

In FY 2024, the glovebox oxygen monitoring system upgrades continued for Building 233-H with expected completion in FY 2025.

Facility Representative (FR) Program (EM)

On June 14, 2024, the Board issued EM-1 a letter with reporting requirements for a report and briefing regarding progress toward resolving identified issues with the site FR program. The letter is a result of an 18-month examination that concluded that the SRS FR program does not fully implement DOE FR program requirements, instead relying too much on the expertise of its FRs. The report and briefing were still under development at the end of FY 2024.

Waste Isolation Pilot Plant

Mining

During FY 2024, DOE kept DNFSB regularly informed of mining operations regarding the West Mains and Panel 11. Mining of the drifts (i.e., tunnels) from the Utility Shaft station toward a future connection with the existing WIPP underground was in progress at the close of FY 2024.

WIPP Waste Management

On March 1, 2024, radioactive contamination was discovered in a TRU Packaging Transporter (TRUPACT) container at the TRUPACT maintenance facility contrary to DOE requirements. DNFSB expressed its concern about this incident in its April 2024 Monthly Resident Inspector Report. In response, the WIPP procedure for free-release of TRUPACT containers for maintenance was revised to prevent a recurrence.

Disposal Operations

In FY 2024, emplacement of waste in Panel 8 continued, filling Rooms 7, 6, and most of 5 at the end of FY 2024. DNFSB was kept informed throughout of emplacement progress.

Aging Mine Hoists

During FY 2024, DNFSB expressed concern over the safety and reliability of the WIPP mine hoisting system due to its age, appearing in multiple DNFSB Monthly Resident Inspector Reports. On August 2, 2024, DOE received a request to discuss the DNFSB preliminary observation report, *Safety Impact of Waste Isolation Pilot Plant (WIPP) Salt Handling Shaft*. Although the August 26, 2024, discussion mostly pertained to the Salt Shaft repair and refurbishment, DNFSB observations were more broadly focused on the ability to provide safe egress from the underground given the age and condition of all three hoists. DOE shares DNFSB's concern and is developing a strategy to address this issue. Further interaction on this topic is anticipated in FY 2025.

Capital Asset Projects

During FY 2024, DOE kept DNFSB informed of progress toward completion of construction associated with the Safety Significant Confinement Ventilation System and Utility Shaft projects. At the close of FY 2024, the ventilation system construction was essentially complete, and commissioning testing was underway in preparation for turnover from the construction contractor to DOE. Utility Shaft construction was completed in FY 2023 and mining of the horizontal drift system which will eventually connect to the existing WIPP underground was in progress at the end of FY 2024. The status of these projects was communicated to DNFSB during weekly calls and during onsite visits in FY 2024.

Safety Significant Confinement Ventilation System Continuous Air Monitors

On May 15, 2024, the Board issued a letter to the Secretary with a reporting requirement for a written response and briefing addressing Board safety concerns over whether the continuous air monitoring system can reliably perform its safety functions in the expected operating environment. The Board letter expressed further concern that the Safety Significant Confinement Ventilation System safety analysis does not credit the engineered control offered for all waste shaft station accident scenarios.

DOE briefed the Board on September 6, 2024, describing a phased approach to bringing the Safety Significant Confinement Ventilation System online in FY 2025. The phased approach includes operability testing of the continuous air monitoring system to ensure performance. DOE outlined how hierarchy of controls was being appropriately applied to accident scenarios in the waste shaft station. DOE committed to continue to analyze all plausible accident scenarios and to make appropriate changes to the WIPP safety basis documentation as needed. The written response was under development at the end of FY 2024.

Y-12 National Security Complex

In January 2024, the Chair of the DNFSB visited Y-12 for discussions with site management and facility familiarization tours.

Infrastructure

Implementation of the Extended Life Program continued in FY 2024 focusing on the strategic maintenance and modernization of the infrastructure of Buildings 9215, 9204-2E and 9995 to sustain safe enriched uranium mission operations until at least FY 2050.

The Extended Life Program contains three major elements: an IP, a Safety Strategy, and an Outage Program. The IP activities in FY 2024 included continued removal of obsolete process equipment and installation of new process equipment.

The Safety Strategy continued to focus on identifying and addressing gaps between the existing facility design and current regulatory codes and standards. Progress in FY 2024 included development of proposed recommendations for practical improvements to reduce nuclear safety risk based on the evaluations of identified gaps for fire, ventilation, and lightning protection codes and requirements. Updating the Probabilistic Seismic Hazard Analysis continued in FY 2024.

The Outage Program, which drives planned dedicated maintenance periods for applicable facilities, continued to receive additional funding for resources to maximize the usefulness of planned outages. Three planners were added to the outage team in FY 2024 and six additional planners are scheduled to be added in FY 2025. Outage Program funding supported four quarterly outage windows in FY 2024.

DNFSB review of Y-12 Aging Management Program in FY 2024 noted several best practices.

Hazard Control Strategies

In FY 2024, DNFSB conducted an onsite review of Y-12 corrective actions implemented in response to the Boards November 2022 concerns with the adequacy of control strategies to ensure that facility worker hazards related to uranium and reactive materials are being addressed. DNFSB noted progress had been made and is planning a review in FY 2025 that will focus on the effectiveness of implemented corrective actions briefed to the Board.

Nuclear Criticality Safety Program

As part of a complex wide review of nuclear criticality safety, DNFSB completed a review of the Y-12 nuclear criticality safety program in FY 2024. The review noted that improvements had been made.

Building 9212 Out-of-Service Systems

In FY 2024, 10 Building 9212 out-of-service systems were permanently isolated as part of the Building 9212 Transition Strategy program. This activity is in response to the July 7, 2021, Board letter regarding concerns with the criticality safety risk in out-of-service systems.

### D. Other Responses to DNFSB

Requests for Information

In FY 2024, the Department responded to 267 specific requests for information that resulted in providing over 3,006 documents to DNFSB.

Meetings and Briefings with the Board

The Department participated in 20 meetings or briefings with the Board in FY 2024. Table 3.1 identifies the meetings and briefings, and the DOE Program office(s) involved.

**Table 3.1. FY 2024 DOE – Board Meetings or Briefings**

| Date | DOE Program Office | Subject |
|---|---|---|
| 10/04/2023 | EHSS | Safety software central registry path forward |
| 10/12/2023 | NA | NA-1 periodic discussion with DNFSB |
| 12/07/2023 | EA | Director, Office of Enterprise Assessments (EA-1) periodic discussion with DNFSB |
| 01/11/2024 | DOE | DOE Deputy Secretary periodic discussion with DNFSB |
| 02/21/2024 | NA | Safety strategy for SRS Plutonium Processing Facility worker protection |
| 03/05/2024 | NA | Safety Analytics, Forecasting and Evaluation Reporting Status Update |

| Date | DOE Program Office | Subject |
|---|---|---|
| 03/06/2024 | EM | Semi-annual briefings of the proposed path forward for seismic engineered controls at the Hanford 242-A Evaporator Facility |
| 04/03/2024 | NA | Briefing regarding the 90-percent complete DSA for the NNSS Device Assembly Facility |
| 04/10/2024 | NA & EM | FY 2023 annual report and briefing for the Nuclear Criticality Safety Program Metrics |
| 04/10/2024 | MA | Briefing regarding DOE's path forward on the revision to DOE O 251.1D, *Departmental Directives Program* |
| 04/24/2024 | NA | Briefing on DOE's progress on safety improvements at Savannah River Tritium Facilities |
| 06/13/2024 | EHSS | Briefing on DOE's path forward for the revision of DOE O 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities* |
| 06/25/2024 | EA | EA-1 periodic discussion with DNFSB |
| 08/06/2024 | NA | Briefing to address LANL glovebox safety issues and NNSA's plans for disseminating lessons-learned from LANL glovebox loss of integrity events |
| 08/15/2024 | EM | Annual report and briefing regarding SRS Building 235-F safety |
| 08/16/2024 | NA | NA-1 periodic discussion with DNFSB |
| 09/06/2024 | EM | WIPP Safety Significant Confinement Ventilation System Continuous Air Monitoring System operability |
| 09/09/2024 | EM | EM-1 periodic discussion with DNFSB |
| 09/10/2024 | DOE | DOE Secretary periodic discussion with DNFSB |
| 09/11/2024 | EM | Semi-annual briefing of the proposed path forward for seismic engineered controls at the Hanford 242-A Evaporator Facility |

Reporting Requirements

The following table provides the status of DOE responses to Board reporting requirements pursuant to 42 USC Section 2286b(d).

**Table 3.2. Status of Board Reporting Requirements**

| Date of Letter | DOE Program Office and Site | Reporting Requirements | Completion Date |
|---|---|---|---|
| 11/02/2021 | EM, SRS | Annual report and briefing regarding SRS Building 235-F safety | Report: 08/13/2024<br><br>Briefing: 08/15/2024 |

| Date of Letter | DOE Program Office and Site | Reporting Requirements | Completion Date |
|---|---|---|---|
| 01/06/2022 | NA, EM | Annual report and briefing regarding Nuclear Criticality Safety Programs | Report: 01/30/2024<br><br>Briefing: 04/10/2024 |
| 08/24/2022 | EHSS | Briefing on the Safety Software Central Registry path forward | Briefing: 06/08/2023 and 10/04/2023 |
| 06/20/2023 | NA, LANL | Report with additional information pertaining to the November 16, 2022, DNFSB public hearing on the safety of the LANL Plutonium Facility | Report 11/20/23 |
| 06/27/2023 | EM, Hanford | Semi-annual briefings of the proposed path forward for seismic engineered controls at the Hanford 242-A Evaporator | Briefing: 03/06/2024 and 09/11/2024 |
| 08/03/2023 | NA, SRS | Report and briefing on DOE's position on the adequacy of the safety strategy for facility worker protection, focusing on impacts to long-lead procurements, such as glovebox systems at SRS Plutonium Processing Facility | Report: 01/18/2024<br><br>Briefing: 02/21/2024 |
| 10/04/2023 | NA, SRS | Report and briefing on DOE's progress on safety improvements at Savannah River Tritium Facilities to include progress of the facility and system upgrades, decisions made for proposed upgrades and analytical initiatives, and the impacts of safety risk reduction | Report: 03/26/2024<br><br>Briefing: 04/24/2023 |
| 12/05/2023 | EHSS | Report and briefing on DOE's path forward for DOE O 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities*, revision | Report: FY 2025<br><br>Briefing: 06/13/2024 |
| 12/12/2023 | NA, NNSS | Briefing in response to Board questions regarding the 90-percent complete NNSS Device Assembly Facility DSA | Briefing: 04/3/2024 |
| 01/24/2024 | MA | Report and briefing regarding DOE's path forward on DOE O 251.1D, *Departmental Directives Program,* revision | Report: 03/25/2024<br><br>Briefing: 04/10/2024 |
| 04/10/2024 | NA, LANL | Briefing to address LANL glovebox safety issues and NNSA's plans for disseminating lessons-learned from the glovebox loss of integrity events investigated at LANL | Briefing: 08/06/2024 |

| Date of Letter | DOE Program Office and Site | Reporting Requirements | Completion Date |
|---|---|---|---|
| 05/15/2024 | EM, WIPP | Report and briefing to address the Board's safety concerns over whether the WIPP continuous air monitoring system can reliably perform its safety functions | Report: FY 2025<br><br>Briefing: 09/06/2024 |
| 06/03/2024 | NA, LANL | An updated schedule of completing LANL DSA updates and a briefing regarding the results of NNSA's IP effectiveness review | Schedule: 08/10/2024<br><br>Briefing: FY 2025 |
| 06/14/2024 | EM, SRS | Report and briefing regarding progress toward resolving identified issues with the SRS FR program | Report: FY 2025<br><br>Briefing: FY 2025 |
| 07/25/2024 | NA, NNSS | Report and briefing that address identified safety-related questions pertaining to the NNSS PULSE Facility (formally U1a Complex) design and operations | Report: FY 2025<br><br>Briefing: FY 2025 |
| 08/13/2024 | NA, NNSS | Written response and briefing regarding identified safety issues associated with the use of lithium-ion batters at DOE DNF's and specifically at the NNSS Device Assembly Facility | Response: FY 2025<br><br>Briefing: FY 2025 |

# IV. Status of DOE Implementation Plans

### A. Process Overview

The Board issues recommendations to the Secretary, via letter and publication in the *Federal Register*, regarding measures it believes the Department should adopt to ensure adequate protection of workers and the public from activities conducted at DOE DNFs. By law, the Secretary is required to accept or reject, in whole or in part, the Board recommendation within 45 days of its publication in the *Federal Register* unless granted an extension by the Board. If the Secretary accepts all or part of the recommendation, an IP addressing the recommendation's concerns is required to be transmitted to the Board within 90 days of the publication of the Secretary's response, or an additional 45 days may be permitted upon notice of the need for additional time sent to Congress and the Board.

The Secretary is required to complete the items in the IP within a year of issuance. If additional time is needed, DOE is required to submit a report to Congress discussing the reasons for delay

and when implementation will be completed. Generally, the scope and technical complexity of the safety issues at DOE DNFs usually require more than a year for completion.

Board recommendations, IPs, and a chronological record of related correspondence between DOE and the DNFSB are available on the DOE Office of the Departmental Representative to the DNFSB website at: https://ehss.energy.gov/deprep/.

**B. Implementation Plan Status**

Recommendation 2019-1: Uncontrolled Hazard Scenarios and 10 CFR 830 Implementation at the Pantex Plant

Issue Date: February 20, 2019.

In January 2024, NNSA notified the Board that all 69 actions identified in Revision 1 of the associated IP were completed. On June 3, 2024, the Board issued a letter noting the FY 2024 annual status briefing was no longer required and adding requirement for a briefing associated with IP effectiveness review.

Recommendation 2020-1: Nuclear Safety Requirements

Issue Date: February 21, 2020.

In FY 2024, DOE completed four milestones contained in the associated IP, i.e.:

1. Completion of an independent review of DNFs safety basis development processes.
2. Compiling and sharing best practices related to aging infrastructure management.
3. Development of a report discussing implementation of aging infrastructure management best practices.
4. Issuance of recommendations related to the independent reviews of safety basis development.

The IP contains 17 milestones, 7 of which were completed prior to FY 2024. The remaining six items are on schedule to be completed as identified in the IP.

Recommendation 2023-1: Onsite Transportation Safety

Issue Date: January 26, 2024.

On March 21, 2024, DOE requested a 45-day extension to respond to the recommendation. The extension was granted on March 29, 2024. DOE accepted the recommendation on May 3,2024. On August 22, 2024, DOE notified the Board that an additional 45 days would be needed to complete the development of the IP. The IP was still being developed at the end of FY 2024.

# Appendix. Acronyms and Abbreviations

| | |
|---|---|
| AEA | Atomic Energy Act of 1954, as amended |
| Board | Defense Nuclear Facilities Safety Board |
| CD | Critical Decision |
| CFR | Code of Federal Regulations |
| Department | Department of Energy |
| DNF | Defense Nuclear Facility |
| DNFSB | Defense Nuclear Facilities Safety Board |
| DOE | Department of Energy |
| DSA | Documented Safety Analysis |
| EA | Office of Enterprise Assessments |
| EA-1 | Director, Office of Enterprise Assessments |
| EHSS | Office of Environment, Health, Safety, and Security |
| EM | Office of Environmental Management |
| EM-1 | Director, Office of Environmental Management |
| FR | Facility Representative |
| FY | Fiscal Year |
| Hanford | Hanford Site |
| ICP | Idaho Cleanup Project |
| IP | Implementation Plan |
| LANL | Los Alamos National Laboratory |
| LLNL | Lawrence Livermore National Laboratory |
| NA | National Nuclear Security Administration |
| NA-1 | Administrator, National Nuclear Security Administration |
| NCERC | National Criticality Experiments Research Center |
| NNSA | National Nuclear Security Administration |
| NNSS | Nevada National Security Site |
| O | Order |
| OREM | Oak Ridge Office of Environmental Management |
| Pantex | Pantex Plant |
| PDSA | Preliminary Documented Safety Analysis |
| PF-4 | Plutonium Facility–Building 4 |
| SC | Office of Science |
| Secretary | Secretary of Energy |
| SNL | Sandia National Laboratories |
| SRS | Savannah River Site |
| STD | Standard |
| TRU | Transuranic |
| TSR | Technical Safety Requirement |
| USC | United States Code |
| WIPP | Waste Isolation Pilot Plant |
| Y-12 | Y-12 National Security Complex |