DEFENSE NUCLEAR FACILITIES SAFETY BOARD (DNFSB)

Nuclear Safety Oversight in New Mexico

Presented to

New Mexico State Legislature's
Radioactive and Hazardous Materials Committee

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Overview

- Overview of the DNFSB
- Interface with the Department of Energy (DOE)
- Aging Infrastructure Campaign
- Recommendation 2023-1, *Onsite Transportation Safety*
- Nuclear Safety Oversight in New Mexico:
  - Los Alamos National Laboratory (LANL)
  - Waste Isolation Pilot Plant (WIPP)
  - Sandia National Laboratories (SNL)
- Public and Worker Engagement

Installation of ducting supporting the Safety Significant Confinement Ventilation System at WIPP

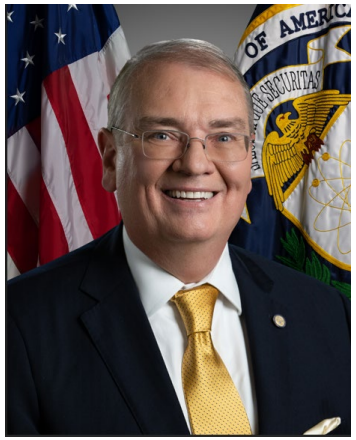
Nuclear safety at DOE's defense nuclear facilities in New Mexico remains adequate, but the Board continues to advise safety improvements.

DNFSB Overview

"The mission of the Board shall be to provide independent analysis, advice, and recommendations to the Secretary of Energy to inform the Secretary, in the role of the Secretary as operator and regulator of the defense nuclear facilities of the Department of Energy, in providing adequate protection of public health and safety at such defense nuclear facilities, including with respect to the health and safety of employees and contractors at such facilities."

Current Board Members

Joyce L. Connery
Chair



Thomas A. Summers
Vice Chair

Dr. Patricia Lee
Member

Vacant

Vacant

Establishment of the DNFSB

- Department of Energy (DOE) is self-regulating
- Late 1980s:
  - Cold War: waning public acceptance of nuclear weapon production and erosion of safety
  - High profile nuclear accidents (e.g., Chernobyl)
- Congress questioned DOE's ability to manage the complex and wanted a body of seasoned experts to report unbiased and timely information on the state of the DOE defense nuclear complex
- Spearheaded by Senator John Glenn
- Congress established the Board and charged it with identifying potential issues of adequate protection at defense nuclear facilities, advising the Secretary of Energy of those issues, and informing the public

Breached nuclear waste container due to plutonium reaction

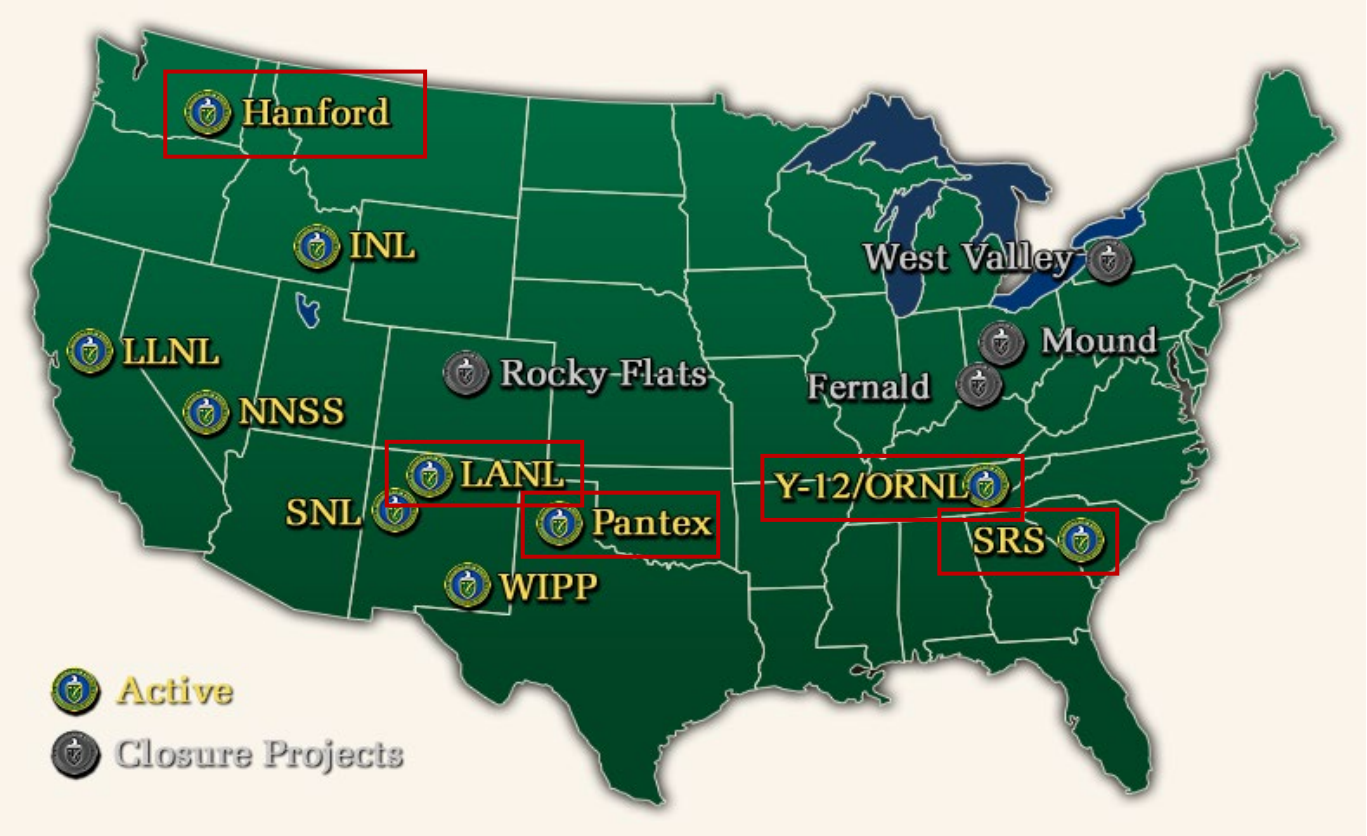
Temporary disposal of nuclear waste at Idaho National Laboratory

Spent fuel pool at Hanford K Reactor

DOE Sites with Defense Nuclear Facilities

10 Active Sites

- Hanford Site
- Savannah River Site (SRS)
- Idaho National Laboratory (INL)
- Sandia National Laboratories (SNL)
- Lawrence Livermore National Laboratory (LLNL)
- Los Alamos National Laboratory (LANL)
- Y-12 National Security Complex (Y-12)/ Oak Ridge National Laboratory (ORNL)
- Pantex Plant
- Waste Isolation Pilot Plant (WIPP)
- Nevada National Security Site (NNSS)



DNFSB maintains on-site resident inspectors at **five** DOE sites

DNFSB Scope of Safety Oversight

Nuclear safety oversight

- Complex, high-hazard operations involving the assembly or disassembly of nuclear weapons, or the operation of nuclear facilities related to DOE's national defense mission
- Remediation of nuclear wastes and legacy facilities from more than 70 years of DOE defense nuclear operations
- Design and construction of new DOE defense nuclear facilities
- Aging and deteriorating mission critical infrastructure at DOE defense nuclear facilities/sites
- Adequacy of DOE safety standards related to design, construction, operation, and decommissioning of defense nuclear facilities

DOE is required by law to grant the Board "prompt and unfettered access to such facilities, personnel, and information as the Board considers necessary to carry out its responsibilities."

Typical glovebox

WIPP transuranic waste face

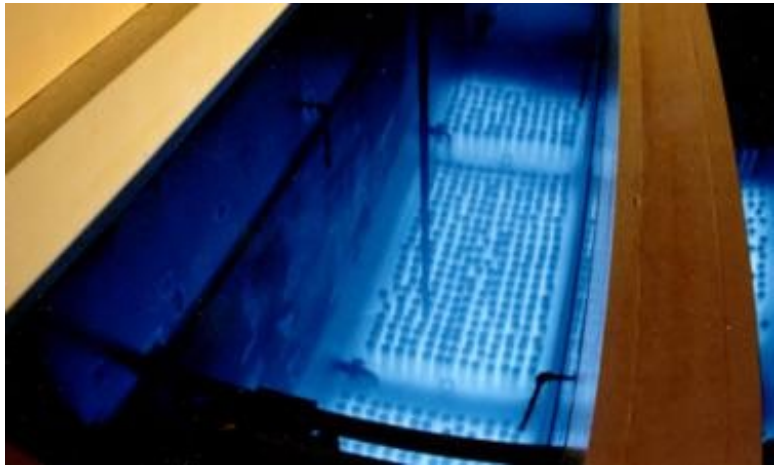
DNFSB Major Activities/Authorities

Statutory safety oversight activities

- Review and evaluate the content and implementation of standards
- Investigate events or practices that may adversely impact public health or safety
- Analyze design and operational data
- Review facility design and construction

Statutory authorities

- Issue formal recommendations to the Secretary of Energy
- Levy reporting requirements on the Secretary of Energy
- Conduct open or closed hearings and meetings, including the power to subpoena witnesses, if needed
- Conduct investigations and special studies



Hanford cesium and strontium capsules

Transuranic waste shipment approaching WIPP

Aging Infrastructure Management Campaign

Aging Infrastructure Website

https://www.dnfsb.gov/aging-infrastructure-management

Public hearing on August 14, 2024

Onsite Transportation Safety (DNFSB Recommendation 2023-1)

- Onsite transportation of radioactive materials is typically conducted per DOE's approved requirements for developing transportation safety documents (TSD) rather than Department of Transportation regulations
- The Board identified weaknesses in LANL's onsite TSD, stemming in part from weaknesses in the directives that govern onsite TSDs
- The Board recommended that DOE:
  - Revise the LANL TSD
  - Rewrite the DOE directives that govern onsite TSDs
  - Perform a causal analysis on weaknesses in DOE oversight
- DOE delivered its implementation plan to the Board on October 7, 2024

Cliff hazards along some Los Alamos roadways were not appropriately analyzed

Plutonium Facility (PF-4) Safety Posture

- PF-4 is the only facility in the DOE complex that can currently process all forms of plutonium in large quantities
- Consequently, PF-4 has an expansive and diverse mission
  - Pit production
  - Stockpile sustainment
  - Heat source plutonium processing
  - Surplus plutonium disposition
- Undergoing transition to a production facility
- PF-4 is an almost 50-year-old facility and is expected to operate for many years

Aerial View of the Los Alamos Plutonium Facility

PF-4 Safety Posture

One of the firewater pump houses servicing the Plutonium Facility

- Resolution of longstanding safety concerns
  - There are weaknesses in the post-seismic confinement strategy
  - Many pieces of equipment in PF-4 (e.g., gloveboxes) do not meet listed seismic rating
- Upgrades to existing controls
  - Fire suppression system being upgraded to withstand design basis seismic events (e.g., additional seismic bracing, new water supply for PF-4)
- Ensuring safe operations
  - Diverse missions in PF-4 compete for space and workers
  - Challenges with increased tempo of operations
  - New documented safety analysis being developed to meet modern standards

Area G

- Positives
  - New documented safety analysis that will meet modern standards nearing completion
  - Progress on retrieving and dispositioning corrugated metal pipes of grouted legacy radioactive waste
  - Potentially reactive waste segregated
- Challenges
  - New documented safety analysis will have many administrative controls, few engineered controls
  - New documented safety analysis will only cover a portion of facility work scope
  - Training and qualification program needs improvement
  - Workforce still relatively inexperienced in nuclear work

Excavation of Corrugated Metal Pipes

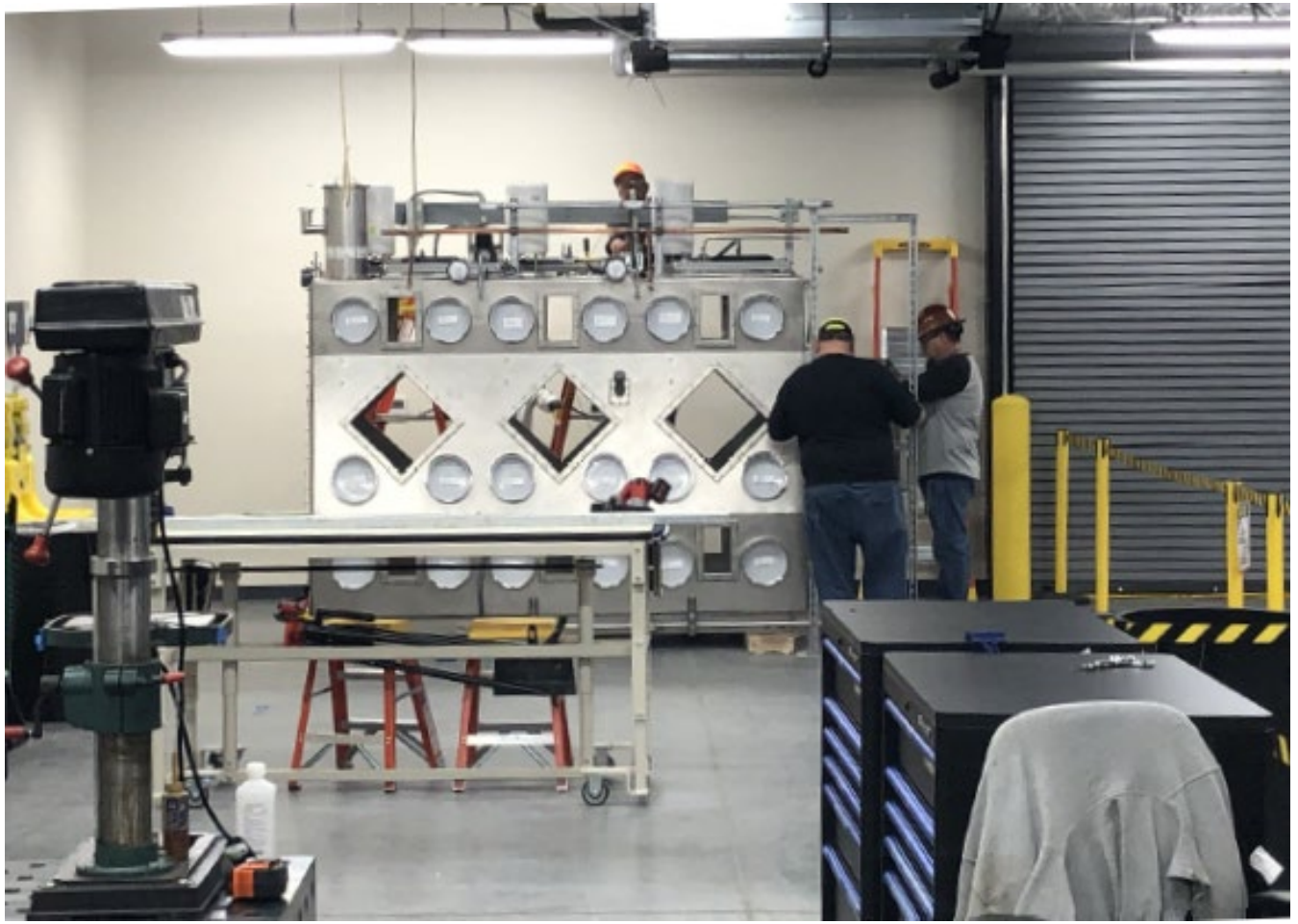
DNFSB Review Plans for Los Alamos

<u>Recent safety challenges identified by the Board</u>

- April 10, 2024: Glovebox safety
- January 19, 2024: Chemical compatibility program for transuranic waste

<u>Reviews planned for FY 2025</u>

- PF-4 Documented Safety Analysis
- Area G Documented Safety Analysis
- Work Planning and Control for Deactivation and Decommissioning
- Glovebox Design, Installation, and Testing
- Follow-up on DOE's Implementation Plan for Recommendation 23-1, *Onsite Transportation Safety*
- DOE Facility Representative Oversight
- Complex-wide Nuclear Criticality Safety



Glovebox Fabrication

Los Alamos Resident Inspectors

David Gutowski
Chemical/Nuclear Engineer

Eric Freeman
Nuclear Engineer

Jason Kemp
Fire Protection Engineer

WIPP Safety Significant Confinement Ventilation System (SSCVS) Safety Concerns

Example CAM unit

Board letter dated May 15, 2024, indicated safety concerns with:

- Ability of continuous air monitors (CAM) to reliably operate in the anticipated underground operating and accident conditions (salt dust and soot)
- Location of CAMs with respect to detecting releases for all accident scenarios and isolate non-safety portions of the system

SSCVS-CAM Locations and Airflow

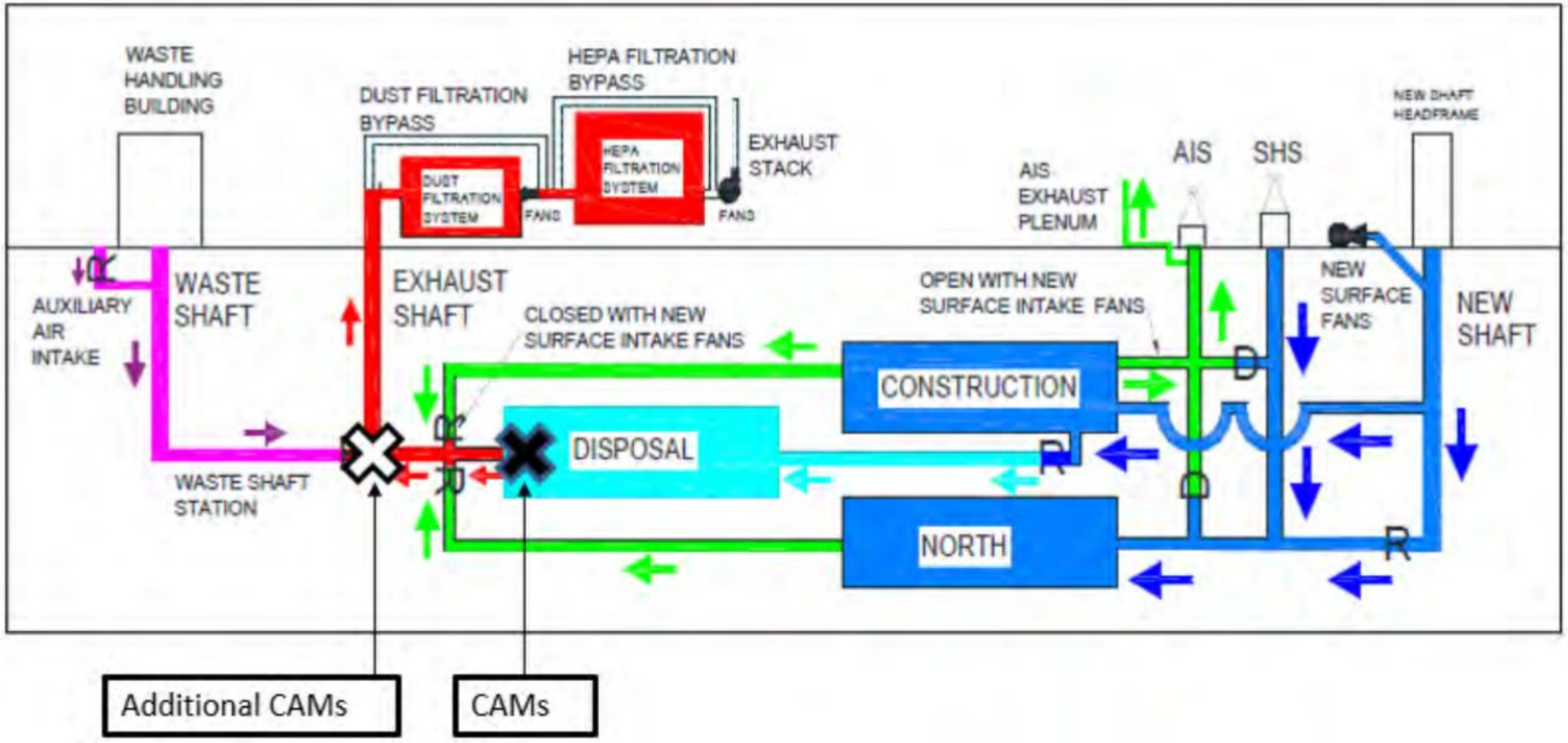


Illustration of airflow in the WIPP underground

SSCVS: Resolution of Safety Concerns

DOE briefing to Board on September 6, 2024

- CAM environmental qualification:
  - Phased startup with non-safety portions of system isolated
  - During this time collect data on the environmental impacts to CAMs
  - Manufacturer testing of CAMs detection capability in heavy particulate conditions
  - Airflow for new waste panel construction routed away from CAMs to reduce salt dust exposure
- Waste Shaft Station safety control selection:
  - Evaluation of the control selection is underway

SSCVS filter building with exhaust duct and stack

Nuclear Safety Oversight Activity at WIPP

Recent safety challenges identified by the Board

- May 15, 2024: SSCVS CAM design
- August 17, 2022: Concerns following 700C fan restart
- September 8, 2021: Evaluating waste containing nitric acid and metal nitrate salts with polysaccharides

Board and staff activities for fiscal year 2025

- SSCVS Project CAM Design Review
- Salt Handling Shaft Structural Review
- Waste Handling Building Confinement Ventilation System
- National Transuranic Waste Program oversight
- Disposition of Los Alamos nitrate salt containers located at Waste Control Specialists in Andrews, TX

Waste offloading in the WIPP underground

Nuclear Safety Oversight Activity at SNL

Recent reviews and oversight areas

- 2025 – Annular Core Research Reactor (ACRR) Fuel Health review (Ongoing)
- 2024 – Vice Chair Summers Visit to SNL to observe annual emergency exercise
- 2023 – Emergency Preparedness and Response Program
- 2022 – Conduct of Operations in Technical Area V
- 2021 – ACRR Fuel Element Inspection startup

TRUPACT-II shipment of Pu experiment chambers to LANL

Public and Worker Engagement

Kyle D. Johnson
Director of Congressional and External Affairs
- 202-701-8964 (Government Cell)
- Kyle.johnson@dnfsb.gov
- Government Affairs, External Communications, and Stakeholder Engagement

Report a Safety Concern
The DNFSB Safety Allegations Program handles concerns raised by members of the public regarding safety at DOE defense nuclear facilities, including safety concerns raised by DOE federal employees and contractors. To report a safety concern, email safetyconcerns@dnfsb.gov. Please include any relevant information regarding your concern.

https://www.dnfsb.gov/safety-allegations

Questions?

Board communications, Resident Inspector weekly reports, site monthly reports, public meeting and hearing information, and additional agency information are available at:

www.dnfsb.gov