

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Nuclear Safety Oversight in New Mexico

Presented to

*New Mexico State Legislature's
Radioactive and Hazardous Materials Committee*

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Associate Technical Director, Field Operations

August 21, 2023

**REVIEWED BY
NA-746 STAFF**

**VERIFIED UNCLASSIFIED
LANL Classification Office**

James C. Foley 8/8/23
Name Date

Contains no DOE/NNSA equity that cannot be released.

Richard Givens, Classification Analyst, NA-746

8/9/2023



Agenda

- Overview of the Board
- Interface with the Department of Energy (DOE)
- Resident Inspector Program
- Nuclear Safety Oversight in New Mexico:
 - Los Alamos National Laboratory (LANL)
 - Waste Isolation Pilot Plant (WIPP)
 - Sandia National Laboratories (SNL)



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



Board Overview

- Established by Congress in 1988
- Five Presidentially-appointed, Senate-confirmed members (bipartisan)
- Statutory mission: *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 defense nuclear facilities**, including with respect to the health and safety of employees and contractors at such facilities*
- The Secretary of Energy determines how best to apply the information provided by the Board.

Current Board Members



Joyce L. Connery
Chair



Thomas A. Summers
Vice Chair



Jessie Hill Roberson
Board Member



Vacant



Vacant



Board Overview—Major Statutory 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 to include subpoenaing witnesses (if needed)
 - Conduct investigations and special studies



Transuranic waste shipment leaving Los Alamos



TRU waste shipment approaching the WIPP site

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.”



Board Overview—Scope of Safety Oversight

- Nuclear safety oversight of:
 - 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, operations, and decommissioning of defense nuclear facilities



Interface Between DOE and DNFSB

The interface between DNFSB and DOE must be consistent with the roles assigned by Congress:

- Maintain DOE's responsibility for self-regulating to provide reasonable assurance of adequate protection from radiological hazards
- Maintain the Board's independence and access to facilities, personnel, and information to conduct safety oversight at Defense Nuclear Facilities to provide advice and make recommendations to the Secretary



DOE & DNFSB Memorandum of Understanding

- FY 2021 congressional committee and conference reports directed development of the MOU
- Deputy Secretary of Energy and DNFSB Chair signed MOU in February 2022
- Supplemental agreement signed June 2022
 - Provides detailed guidance on access to facilities and information by DNFSB
- Board also provides Congress a biannual report on information denials





Resident Inspector Program

- Duties
 - Observe operations and emergency drills
 - Field inspections
 - Review implementation of safety controls & programs
 - Review operational events
 - Interface with DOE and contractor senior management
 - Meet with stakeholders
 - Identify topics that warrant a headquarters review

- Field Oversight Examples:



Unsealed fire penetration in PF-4



Unsecured sharps in high contamination area



Los Alamos Resident Inspectors



David Gutowski
Chemical/Nuclear Engineer



Adam Boussof
Fire Protection Engineer

3rd RI actively being recruited

Note: Former RI Jonathan Plaue is now Associate Technical Director for Nuclear Facility Infrastructure & Projects

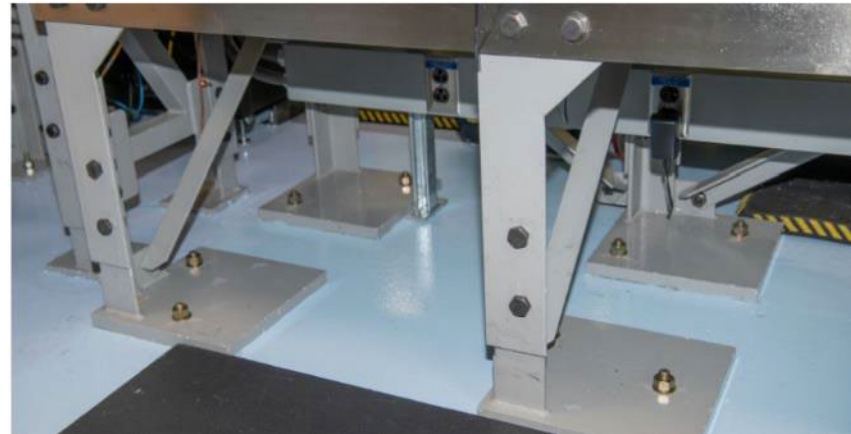


Plutonium Facility (PF-4) Safety Upgrades

Resolution of long-term safety concerns is a top priority

Goals:

- Improve seismic capability of:
 - Building structure
 - Gloveboxes
 - Confinement ventilation system
 - Fire suppression system
- Improve reliability of confinement ventilation system
- Develop a safety basis accurately describing all hazards and appropriate controls
- Improve discipline of operations



Seismically Qualified Glovebox Stand



Seismically Deficient Glovebox Stand

Key Topic of Public Hearing in Santa Fe November 16, 2022



PF-4 Safety Upgrades (cont.)



New Facility Control System Components

Improvements

- Seismic upgrades to facility structure
- Continued testing to verify structural robustness
- Seismic upgrades of fire suppression system (in progress)

More to be done

- Confinement Ventilation System upgrades
- Development of modern safety basis
- Training the growing workforce to improve disciplined operations



Fiber Wrapping of Structural Columns



Safety Posture at Area G

Transuranic waste operations face several challenges

- Current safety basis only addresses part of the entire work scope
- Compensatory measures are in place for limited scope of work, but the safety basis must be updated to meet modern standards and support the full scope of work
- Current work involves a heavy reliance on administrative controls, which are prone to human errors
- Much of the workforce has limited hands-on experience performing nuclear operations
- Physical work includes several industrial hazards



Practice Cut of Surrogate Corrugated Metal Pipe to Demonstrate Readiness

See Board letter dated August 17, 2022



Recent DNFSB Letters Impacting Los Alamos

January 6, 2022 Onsite transportation

Concern: Weakness with LANL approach to transportation safety

Status: DOE responded September 13, 2022.

June 2023 LANL implemented compensatory measures in its Transportation Safety Document.

August 11, 2022 Plutonium Facility leak path factor methodology

Concern: How much plutonium DOE assumes will leak out of Plutonium Facility during an earthquake

Status: DOE responded on November 8, 2022.

Board's staff completed their review of the methodology. Will evaluate how it is used in new safety analysis.

August 11, 2022 Receipt and repackaging of large quantities of heat source plutonium

Concerns: Puts Plutonium Facility in condition where NNSA had to accept additional risk

Letter noted that upgrading the ventilation system would better support new hazardous missions without accepting additional risk.

Status: No formal response requested.

Ventilation system is still undergoing incremental improvements.

Readiness reviews for material receipt found issues that will require NNSA to approve changes to the safety basis.



Recent Letters (cont.)

August 17, 2022 Area G Safety Posture

Concern: DOE is accepting substantial risk with the current safety basis. This is mitigated by the limited set of operations allowed until a new safety basis is in place.

Status: No formal response requested from DOE. Area G continues to operate under the old safety basis. The new modern safety basis is nearing completion.

December 6, 2022 Removal of Deluge Sprinklers from Filters at RLUOB/PF-400 and Planned Similar Actions for the Plutonium Facility

Concern: The technical basis for removing the deluge sprinklers protecting HEPA filters had several weaknesses.

Status: DOE responded on April 19, 2023.

DOE stated their approach is valid, but they will perform additional calculations to improve justifications. Calculations in progress.

June 20, 2023 Follow-up From the November Public Hearing on the Safety Posture of the Plutonium Facility.

Concern: The Board requested more detail on 1) the planned final state of the ventilation system, 2) how the fire suppression system will serve its safety function, and 3) evacuation times during an emergency.

Status: Response anticipated shortly.

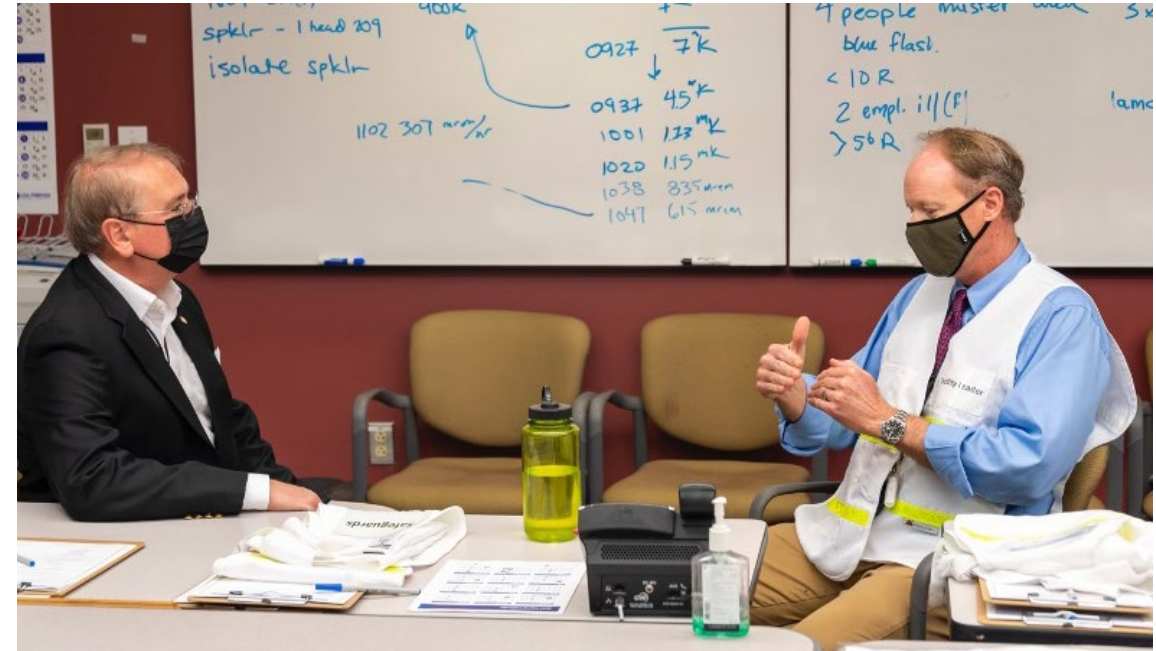


DNFSB Review Plans for Los Alamos

Reviews in Progress for FY 2023

- Atmospheric dispersion – Triad and N3B
- Decontamination and decommissioning work planning and control (PF-4 and CMR)
- Glovebox integrity
- Transuranic waste chemical compatibility evaluations
- Emergency preparedness exercise
- Aqueous nitrate readiness
- Fire suppression system testing (PF-4)
- Interim seismic risk (PF-4)
- Nuclear criticality safety
- Underground electrical cabling

FY 2024 Review Planning is in Progress



DNFSB Vice Chair Summers and Plutonium Facility Operations Director Following 2022 Annual Emergency Exercise



Nuclear Safety Oversight Activity at WIPP

Recent safety challenges identified by the Board

- August 17, 2022: Concerns following 700C fan restart
- September 8, 2021: Concern with DOE's technical basis for concluding wastes with polysaccharides exposed to nitric acid or nitrate salts become safe after a period of time
- August 13, 2021: Safety Instrumented Alarm System
- May 29, 2020: Safety basis weaknesses

Board and Staff Activities for FY 2023

- Full Board visit August 22 – 24
- Safety Significant Confinement Ventilation System project Continuous Air Monitor design review
- National Transuranic Waste program oversight
- Disposition of Los alamos nitrate salt containers located at Waste Control Specialists in Andrews, TX



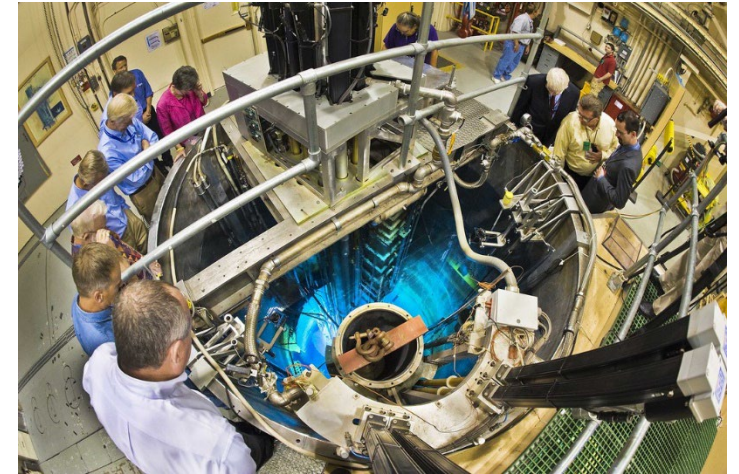
WIPP Underground



Nuclear Safety Oversight Activity at SNL

Recent reviews/oversight areas:

- 2023 – Emergency Preparedness and Response Program review
- 2023 – Vice Chair Summers Visit to SNL
- 2022 – Review of Conduct of Operations in Technical Area V
- 2021 – Inspection of fuel elements from the Annular Core Research Reactor
- 2019 – Start-up of shipments to WIPP



Annular Core Research Reactor



Artist's Rendering of Sandia's new Emergency Operations Center



Questions?

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

Defense Nuclear Facilities Safety Board

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The Defense Nuclear Facilities Safety Board is an independent organization within the executive branch of the United States Government, chartered with the responsibility of providing recommendations and advice to the President and the Secretary of Energy regarding public health and safety issues at Department of Energy defense nuclear facilities.

www.DNFSB.gov