



**DEFENSE NUCLEAR FACILITIES SAFETY BOARD
(DNFSB)**

Chairman Joyce Connery

November 1, 2021

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

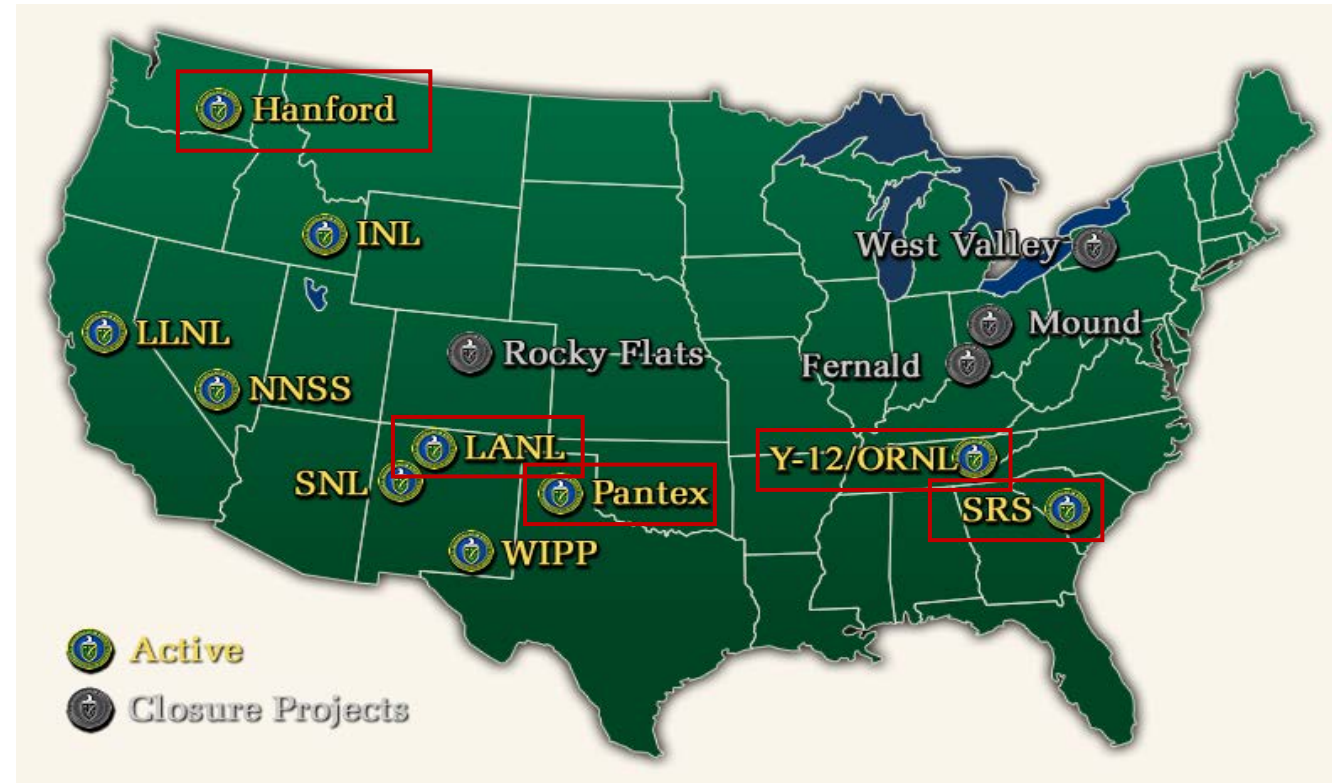
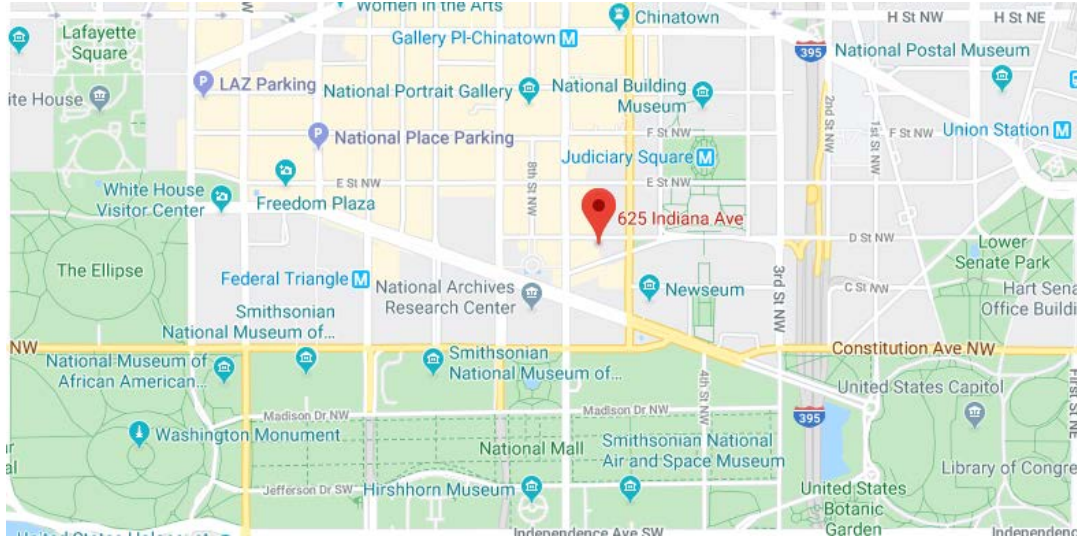


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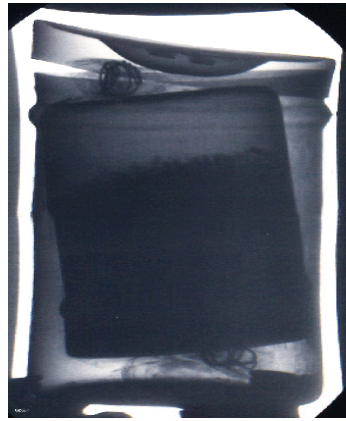
Locations



Establishment of the DNFSB

- Department of Energy 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 INL

Spent fuel pool at Hanford K Reactor



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 subpoena 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.”

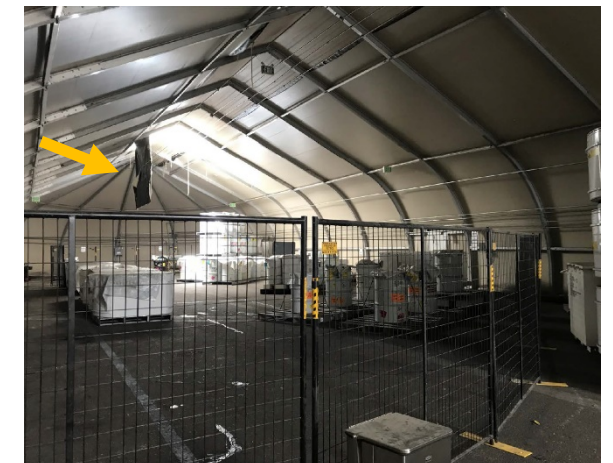
Board Overview—Scope of Safety Oversight

- 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

Resident Inspectors perform near-continuous oversight at Hanford, Los Alamos, Pantex, Savannah River Site, and Y-12



Dome 49 at Area G



LANL Area G with roof skin ripped open and drums exposed

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; identify and mitigate risks to an acceptable level in operating its defense nuclear facilities; and conduct government oversight of its contractors
 - 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

Conduct of Technical Reviews

- The technical staff performs reviews to obtain and provide the Board information to independently:
 - Determine whether DOE, its contractors, and its sub-contractors are adequately implementing appropriate laws, regulations, directives, invoked DOE technical standards, and applicable national consensus standards
 - Analyze design and operational data used in DOE's activities to evaluate technical adequacy
 - Determine whether DOE's programs and activities will adequately protect the public and workers

Nuclear Materials Processing and Stabilization

DOE Environmental Management Sites

- Hanford
- Savannah River Site
- Waste Isolation Pilot Plant
- Idaho National Laboratory
- Oak Ridge – Environmental Management

Focus Areas

- Waste characterization
- Facility decommissioning/demolition
- Remediation efforts



Transuranic waste storage at Idaho National Laboratory

Nuclear Weapon Programs

National Nuclear Security Administration Sites

- Los Alamos National Laboratory
- Sandia National Laboratories
- Y-12 National Security Complex
- Pantex Plant
- Savannah River NNSA Facilities (i.e., Tritium Facilities)
- Nevada National Security Site
- Lawrence Livermore National Laboratory



Flat-top Criticality Assembly



Annular Core Research Reactor at SNL

Focus Areas

- Uranium & plutonium processing
- Assembly/disassembly of nuclear weapons
- Tooling design
- Critical & subcritical experiment operations



Explosives testing at NNSS

Nuclear Programs and Analysis

- Focus on complex-wide issues and safety management programs
- Focus areas:
 - Criticality Safety
 - Conduct of Operations
 - Directives
 - Safety Basis
 - DOE Oversight
 - Emergency Response



Nuclear Facilities Infrastructure and Projects (NFIP) and Field Operations (FO)

- NFIP focuses on design and construction, aging infrastructure and project management
 - Los Alamos Plutonium Pit Production
 - Savannah River Plutonium Processing Facility
 - Waste Treatment and Immobilization Plant High-Level Waste Facility
 - Maintenance of Underground Cabling
 - Lawrence Livermore National Laboratory Building 332 Seismic Safety
 - Plutonium Facility Seismic Performance Assessment
 - Structural Performance Review of Y-12 Facilities with Enduring Missions
- FO supervises the resident inspectors, who are at SRS, Y-12, LANL, Pantex, and Hanford

Major Areas of Concern

- Nuclear Safety Requirements
- Aging Infrastructure
- Nuclear Criticality Safety
- Emergency Response
- Conduct of Operations
- Nuclear Explosive Safety
- Seismic Hazards
- Transuranic Waste Safety



Ruptured drum at INL



Debris From Ceiling Fall in Y-12 Building 9204-2



New drag strut at LANL PF-4 for seismic performance

Uncertainty Principles for Discussion

- 1) Where there is reducible uncertainty, efforts should be put into reducing the uncertainty;
- 2) Where there is unreduced or irreducible uncertainty, then the threat of harm should be assumed to be present;
- 3) Burden of proof rests with the proponents of the activity, not with the opponents.

These are the key aspects of the constraints placed on both the operator and the regulator in dealing with the public

Overall HEALTH of D&D Programs

1. Increase Stability – create a more stable operating environment for high-risk facilities and activities

2. Manage organizational change – ensure continuity of important safety-related responsibilities and functions

3. Improve Countermeasures – strengthen checks and balances between safety and mission responsibilities

4. Monitor Safety Awareness – continually monitor health of cultures and safety programs and seek improvement

ADDRESSING UNKNOWNNS

- PRACTICE, PRACTICE, PRACTICE—Conduct of Operations and procedures should be specific, detailed and rehearsed
- The inevitable unknown—what to do? REASSESS hazards! Pause until new hazards are assessed and procedures adapted
- Emergency Response—Full scale drills with relevant responders & communities. Assess and practice again.
- Firm but flexible. Be firm in commitment to safe operations, but flexible in approach. There can be risk introduced to gain benefit.
- COMMUNICATE, COMMUNICATE, COMMUNICATE...start with the question: WHY?

Questions?

Board communications, Resident Inspector weekly reports, Public Meeting and Hearing information and other agency information are available at:

www.DNFSB.gov

