Defense Nuclear Facilities Safety Board

Community Outreach Event

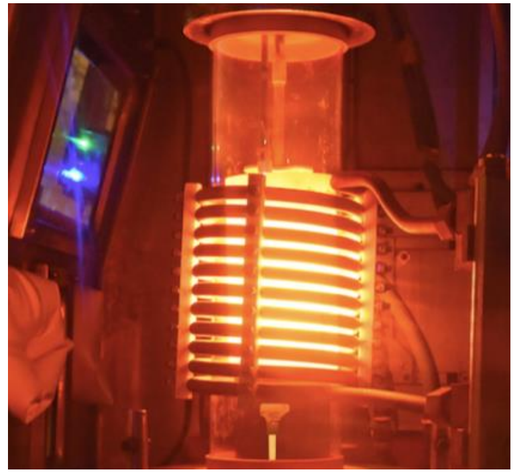
August 18, 2025

Establishment of the DNFSB

- US nuclear weapons are produced in the Department of Energy's (DOE) defense nuclear facilities for the Department of Defense. Defense nuclear facilities also stabilize (i.e., clean up) radioactive wastes from previous nuclear weapons manufacturing.

- <u>Late 1980s:</u>
  - High profile nuclear accidents (e.g., Chernobyl).
  - Congress questioned DOE's ability to manage the complex safely and wanted a body of experts to report unbiased and timely information on the state of the DOE defense nuclear complex.
  - Spearheaded by Senator John Glenn.

- Congress established the Defense Nuclear Facilities Safety Board (DNFSB) 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.



Molten plutonium for weapons production at the Plutonium Facility at Los Alamos National Laboratory.

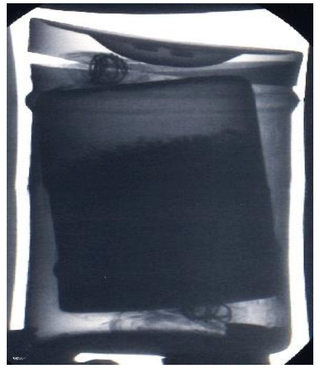
Retrieval of liquid high-level radioactive waste at the Hanford Tank Farms

Who is DNFSB?

- By statute, DNFSB Members are required to be “respected experts in the field of nuclear safety with a demonstrated competence and knowledge relevant to the independent investigative and oversight functions of the Board.”

- DNFSB has a highly-trained technical staff—Nearly all have master’s degrees, and many have doctorates in fields like nuclear, chemical, mechanical, earthquake, and fire protection engineering.
  - Many have a decade or more of experience in the nuclear weapons complex and cannot be easily replaced.
  - DNFSB staffing is statutorily capped at 130 FTE.

- DNFSB has a 35-year history of providing independent analysis, advice, and recommendations to the Secretary of Energy to ensure the health and safety of the public and workers at defense nuclear facilities.



Breached nuclear waste container due to plutonium reaction

Temporary disposal of nuclear waste at Idaho National Laboratory

Spent fuel pool at Hanford K Reactor

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." - Atomic Energy Act of 1954, as amended

Current Board Members

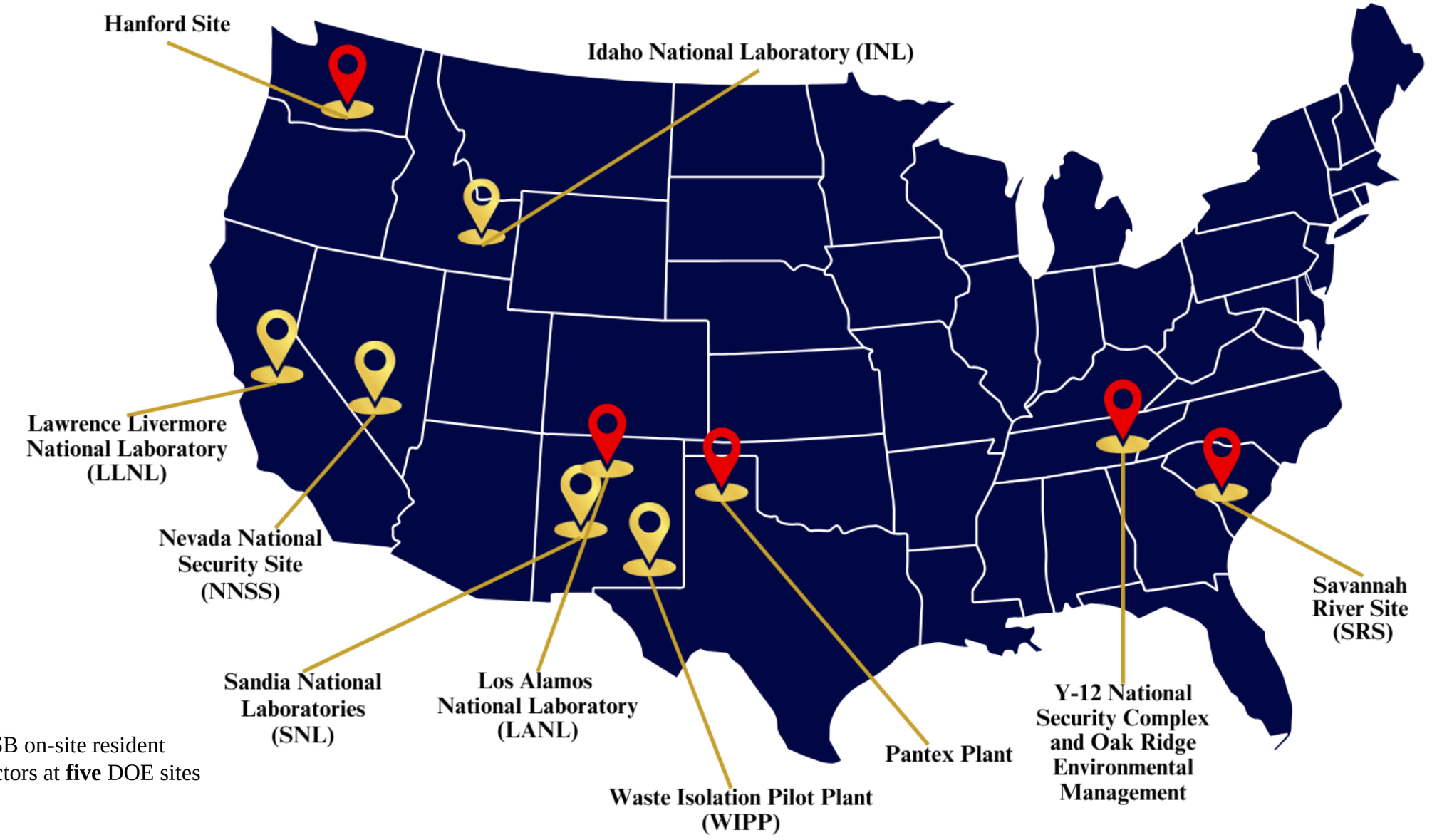
Thomas A. Summers
Acting Chairman

Dr. Patricia L. Lee
Member

3 Vacancies

Given the loss of Board quorum, the DNFSB Chair is empowered by the Atomic Energy Act to carry out the functions of the Board, in consultation with any other remaining Board Members, for a period of one year.

DOE Sites with Defense Nuclear Facilities



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

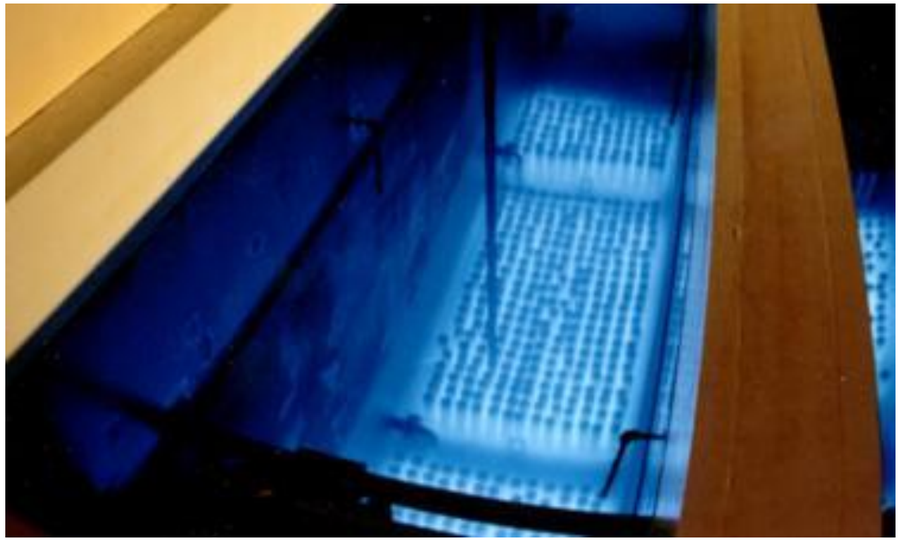
Scope of DNFSB Safety Oversight

- 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 80 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.

Typical glovebox

WIPP transuranic waste

DNFSB Statutory Authorities



Hanford cesium and strontium capsules

Transuranic waste shipment approaching WIPP

- Issue formal recommendations to the Secretary of Energy about adequate protection of public health and safety.
- 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.

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*."

DNFSB's Tools to Voice Nuclear Safety

Recommendations: Require DOE to either:

(a) fix issues that challenge the adequate protection of the health and safety of the public and workers at defense nuclear facilities or
(b) inform Congress why it rejected the DNFSB's Recommendation.

Reporting Requirements: DOE must provide its analyses or actions it plans to take (or has taken) to remediate safety issues at defense nuclear facilities.

Advice Letters and Reports: Advise DOE on questionable practices, potential root causes, or problems impacting multiple defense nuclear facilities.

Staff-To-Staff Discussions: Promote staff-to-staff fixes to identified nuclear safety issues as early as possible. DOE and its contractors often appreciate DNFSB staff feedback and the opportunity to address issues at the lowest level.

Nevada National Security Sites

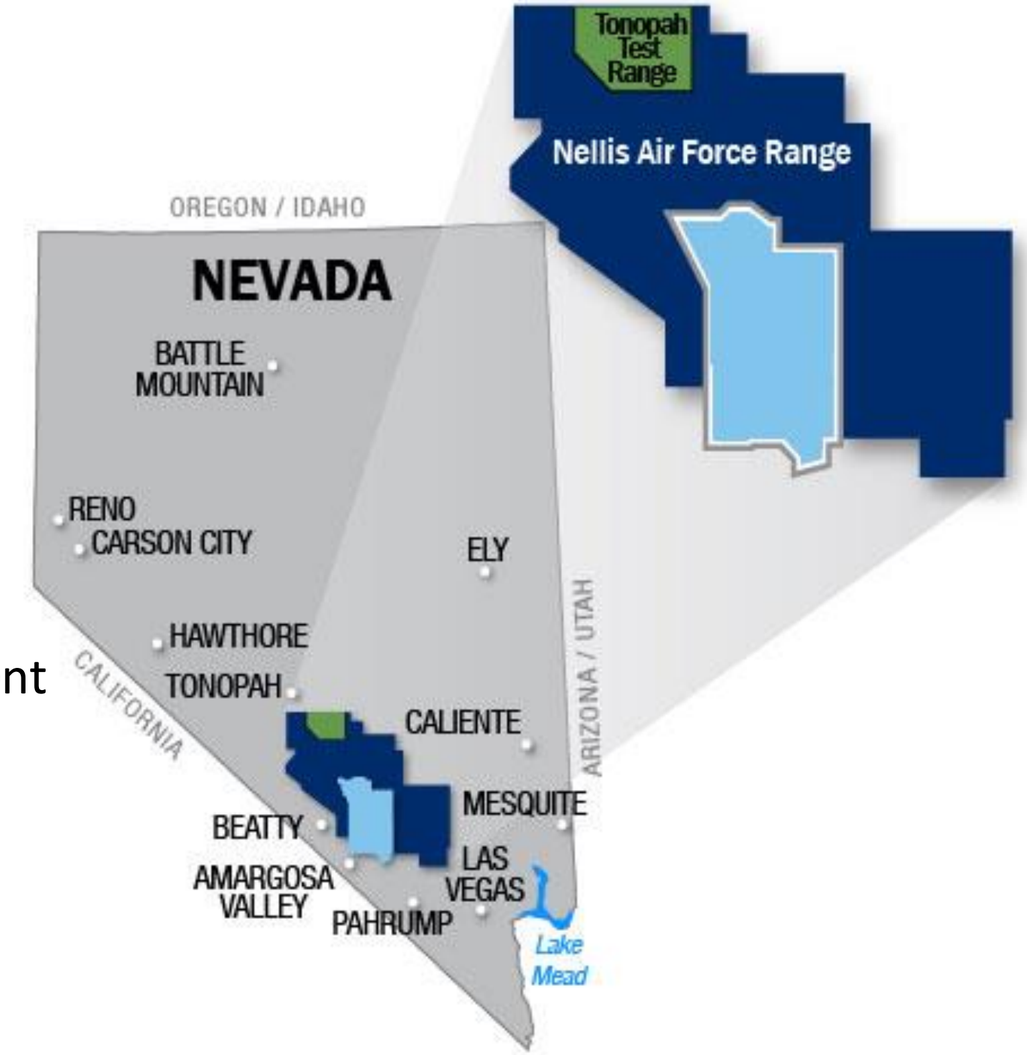
Functions: Help ensure that nuclear weapons continue to function through the stockpile stewardship program (e.g., conduct experiments with special nuclear material with or without high-explosives), conduct nuclear criticality experiments, and dispose of low-level and mixed low-level radioactive waste.

Current Issues:

- Potentially under-designed safety controls due to unanalyzed seismic faults in the Principal Underground Laboratory for Subcritical Experimentation.

- Current shipping container for transferring a subcritical experiment package does not provide protection from fires or electrical insults.

- DOE installed large-format lithium-ion batteries in the Device Assembly Facility without fully considering the hazards of these devices.

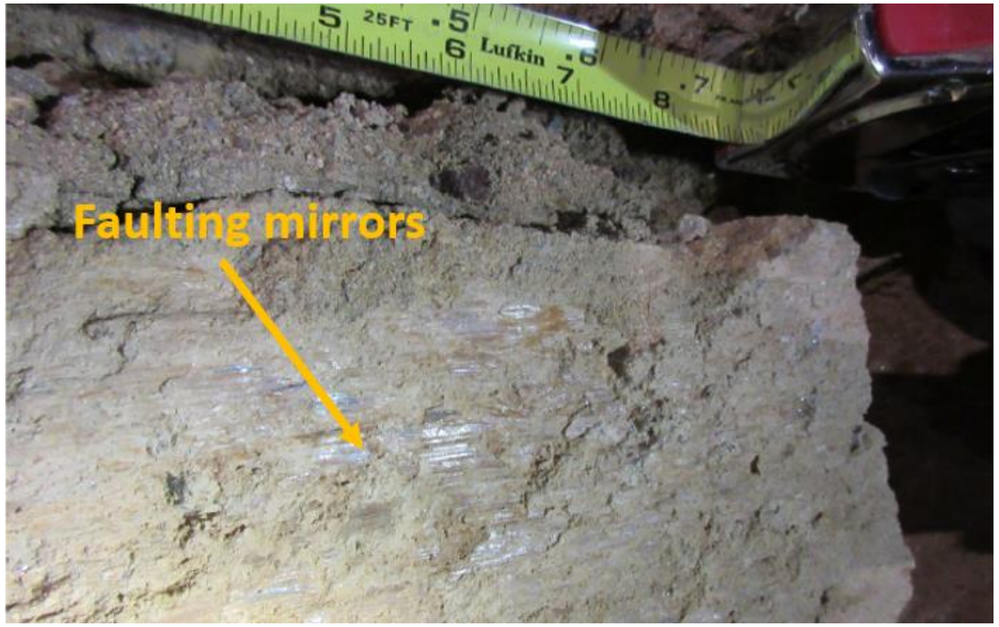


Nevada National Security Sites

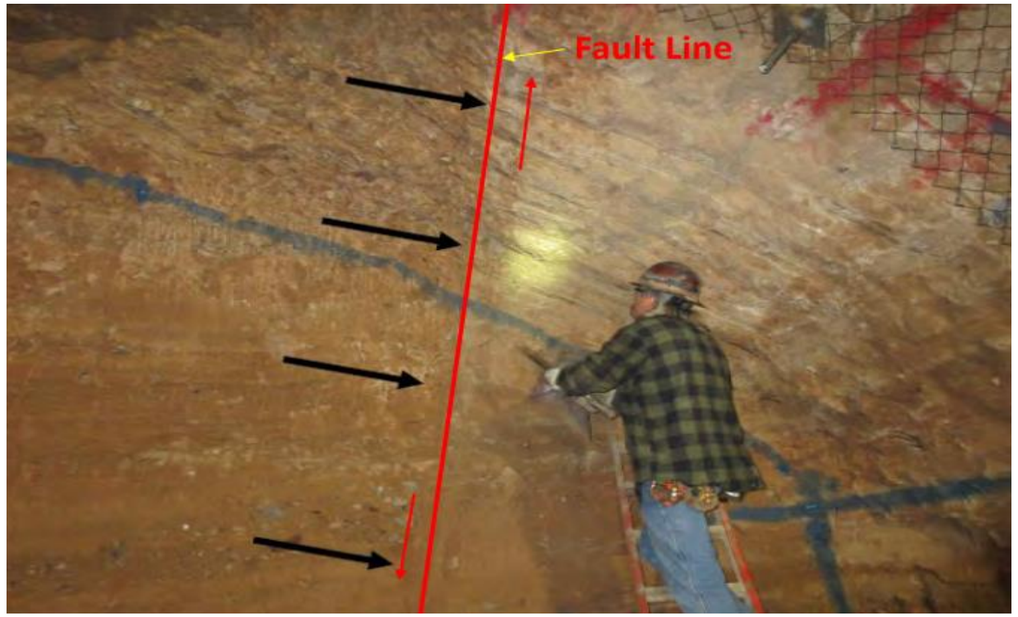
Current Safety Issue: Potentially under-designed safety controls due to unanalyzed seismic faults in the Principal Underground Laboratory for Subcritical Experimentation.

- In a letter dated July 25, 2024, the DNFSB found that DOE had not adequately characterized the seismic faults. This means that the design of seismic safety controls may not account for the earthquake risk associated with these faults and these controls may not perform their intended safety function during and after a seismic event.

- DOE responded on December 11, 2024, stating that it is developing a plan to perform a more detailed investigation of the historic seismic activity of the faults present in underground facility but did not provide a schedule or timeline for completing this investigation.



Indications of rapid fault movements.



Evidence of seismic faults in the Principal Underground Laboratory for Subcritical Experimentation.

Nevada National Security Sites

Current Safety Issue: The current shipping container for transferring a subcritical experiment package (nuclear material with explosives) does not provide protection from fires or electrical insults.

- In a letter dated July 25, 2024, the DNFSB found that DOE needs to procure a modern shipping container to properly protect nuclear experiments during transit. The concern is an accident involving the explosive dispersal of radioactive materials.

- A new shipping container would represent a robust, engineered control and minimize reliance on worker actions. DOE did not include such a container in the line-item projects underway at NNSS.

- DOE responded on December 11, 2024, agreeing that a modern shipping container is desired and indicating it was evaluating options to fund a new container. DOE did not provide a schedule or timeline for procuring this new container.

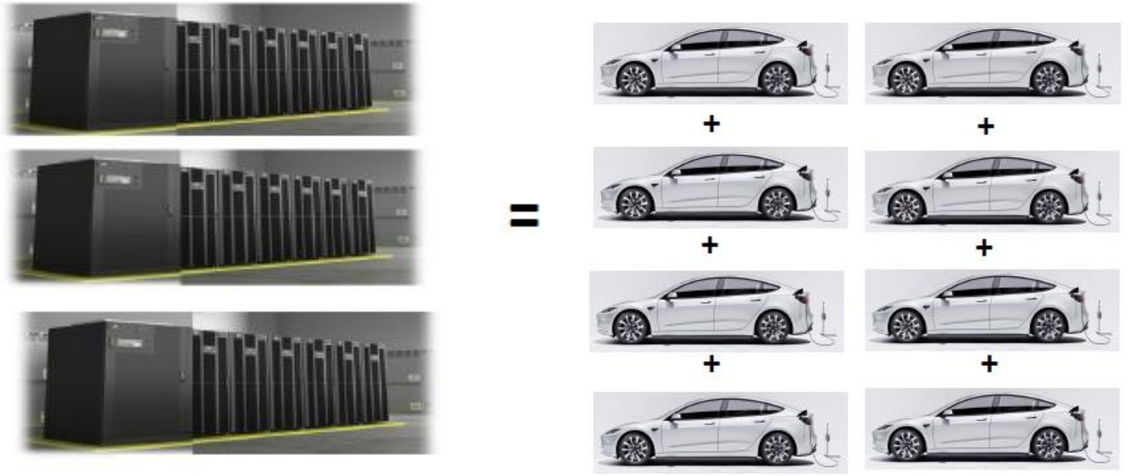
Shipping container for subcritical experiments involving radioactive materials and high-explosives.

Nevada National Security Sites

Current Safety Issue: DOE installed large-format lithium-ion batteries in the Device Assembly Facility without fully considering the hazards of these devices.

- In a letter dated August 13, 2024, the DNFSB found 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. Such large batteries pose a unique, energetic fire risk in a nuclear facility.
- DNFSB also cited specific concerns related to the co-location of emergency lighting equipment, incomplete testing of the batteries for thermal runaway, and inadequate fire protection measures.
- DOE responded on March 14, 2025, providing clarification on its expectations for use of an applicable industry consensus standard for such batteries. DOE provided this information to all its sites. DOE and its contractor also took action to resolve the emergency lighting concern and are further evaluating the battery testing and fire protection concerns.

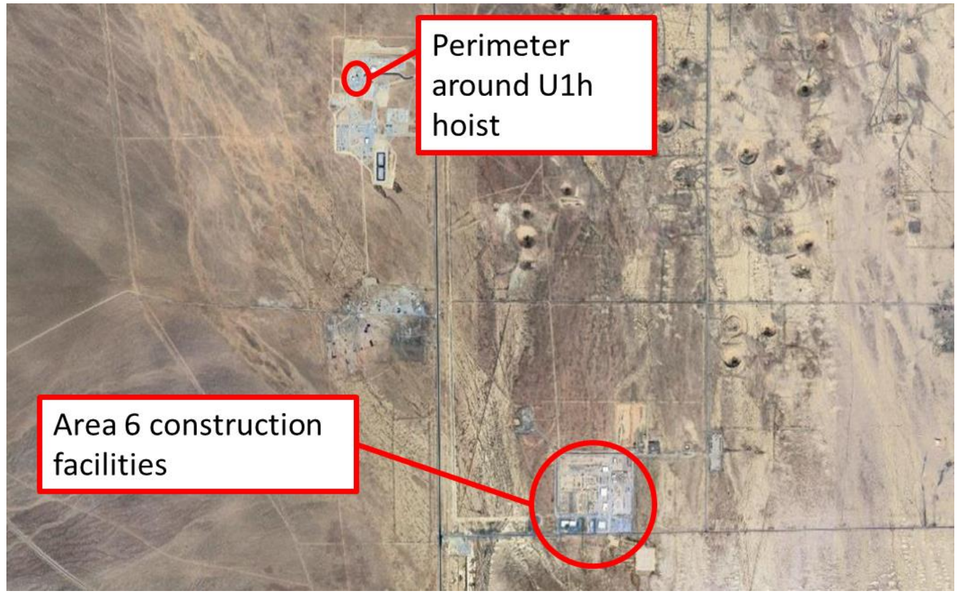
Device Assembly Facility at NNSS.



Uninterruptible power supply battery capacity inside the Device Assembly Facility is equivalent to approximately 8 electric vehicles.

Nevada National Security Sites

Past Impacts:



In response to the DNFSB's letter dated December 1, 2021, DOE moved the location of workers used in safety analyses for purposes of safety control design from the Area 6 construction facilities (~3,500 m) back to 100 m as specified in DOE requirements. Prior to this change, DOE was underestimating the risks to workers and not applying needed design and safety pedigree for safety controls.

In response to the DNFSB's letter dated July 25, 2024, DOE identified deviations to industry standards related to fasteners and welds for the vessel used for executing subcritical experiments.

DNFSB Activities Related to NNSS

U1h shaft at Principal Underground Laboratory for Subcritical Experimentation.

Underground drift in Principal Underground Laboratory for Subcritical Experimentation.

Active Safety Reviews

- Fire protection strategy for Principal Underground Laboratory for Subcritical Experimentation.
- Startup of the enhanced staging project at the Device Assembly Facility.
- Dynamic criticality safety evaluations and device response methodology for subcritical experiments.
- Seismic analysis of the Device Assembly Facility

Addressing Safety Allegations from Workers and the Public

The DNFSB makes it easy for anyone to submit safety allegations in a confidential manner. The DNFSB reviews all safety concerns within its jurisdiction promptly and dispositions them in accordance with veracity and safety significance.

The DNFSB received multiple concerns from employees at the Pantex Plant about the lack of discipline applied to nuclear explosive operations, the training and qualification program, excessive overtime work, and how management views safety. This is important because workers need to strictly follow procedures to prevent accidents. For example:

- DNFSB reviewed the allegation, confirmed certain issues, and sent a letter to DOE dated June 9, 2021.

- In a response dated August 5, 2021, DOE improved worker training and reinforced expectations on how work is performed to prevent accidents and unnecessary rework.

Questions?

www.dnfsb.gov

DNFSB recommendations, letters, reports, site weekly reports, impacts, and more.