



Los Alamos National Laboratory: Our safety culture and practices

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Raising Safety in Research: Scaling Up Safety in Individual Research Projects

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Department of Energy – National Laboratories

The Department of Energy national laboratories (17) are defined in 42 USC 15801

- DOE Office of Science
 - Ames Laboratory, Argonne National Laboratory, Brookhaven National Laboratory, Fermi National Accelerator Laboratory, Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, Princeton Plasma Physics Laboratory, Stanford Linear Accelerator Center, and Thomas Jefferson National Accelerator Facility
- DOE Office of Nuclear Energy - Idaho National Laboratory
- DOE Office of Fossil Energy and Carbon Management - National Energy Technology Laboratory
- DOE Office of Environmental Management - Savannah River National Laboratory
- DOE Office of Energy Efficiency & Renewable Energy - National Renewable Energy Laboratory
- National Nuclear Security Administration - Los Alamos National Laboratory, Lawrence Livermore National Laboratory, & Sandia National Laboratories

Department of Energy – Sites & Plants

- Beyond the 17 DOE national laboratories, the Department has several other sites:
 - Bettis Atomic Power Lab, Hanford Site, Kansas City National Security Campus, Knolls Atomic Power Lab, Nevada National Security Site, Pantex Plant, Savannah River Site, Waste Isolation Pilot Plant, and Y-12 National Security Complex
- “The Department of Energy (DOE) enterprise is comprised of approximately 14,000 federal employees and over 95,000 management and operating contractor and other contractor employees at the Department’s headquarters in Washington, D.C. and 83 field locations.”
- GOGO - Government Owned and Government Operated (1 of 17 NLs)
- GOCO - Government Owned and Contractor Operated (16 of 17 NLs)

Department of Energy – Integrated Safety Management

- The Atomic Energy Act provides statutory authority to DOE to regulate occupational safety and health matters relating to private sector employees at facilities subject to the AEA. Therefore, OSHA does not inspect the working conditions of these contractor employees. DOE's statutory authority extends to construction, including new construction, on GOCO facilities.
- DOE Worker Safety and Health Program (10 CFR Part 851)
- DOE Policy 450.4A – Integrated Safety Management Policy
- DOE Order 450.2 – Integrated Safety Management
- DOE Guide 450.4-1C – Integrated Safety Management System Guide
- DEAR 970.5223–1 Integration of environment, safety, and health into work planning and execution.

Department of Energy – Integrated Safety Management

- GUIDING PRINCIPLES:
 - 1. Line Management Responsibility for Safety
 - 2. Clear Roles and Responsibilities
 - 3. Competence Commensurate with Responsibilities
 - 4. Balanced Priorities
 - 5. Identified of Safety Standards and Requirements
 - 6. Hazard Controls Tailored to Work Being Performed
 - 7. Operations Authorization, and
 - 8. Worker Involvement
- CORE FUNCTIONS:
 - 1. Define the Scope of Work
 - 2. Identify and Analyze the Hazards
 - 3. Develop and Implement Hazard Controls
 - 4. Perform Work within Controls
 - 5. Provide Feedback and Continuous Improvement

Hazard Grading and Authorizing / Executing Work

- Hazard Grading
 - Low Hazard
 - Moderate Hazard
 - High Hazard / Complex
- Positions involved in authorizing and performing work
 - Responsible Line Manager (RLM)
 - Facility Operations Director (FOD)
 - Person In Charge (PIC)
 - Worker(s)

Work Authorizing Documents

- Integrated Work Documents (IWD)
 - Work Area Information
 - Work Tasks / Steps
 - Hazards, Concerns, and Potential Accidents / Incidents
 - Controls, Preventive Measures, and Bounding Conditions
 - Reference Documents
 - Training

Detailed Operating Procedure (DOP)

- Contains all the elements of an IWD and further contains the work procedure.

Conduct of Operations (ConOps) - DOE Order 422.1

- “A Conduct of Operations Program consists of formal documentation, practices, and actions implementing disciplined and structured operations that support mission success and promote worker, public, and environmental protection.”

Safety Resources

- Worker Environment Safety and Security Teams
- Asbestos Safety Program
- Aviation Safety and Security Program
- Chemical Management Program
- Chronic Beryllium Disease Prevention Program
- Cryogenics and Compressed Gases Program
- Electrical Safety Program
- Explosives Safety Program
- Fall Protection
- Fire Protection Program
- Glovebox Safety Program
- Laser Safety Program
- Lead Management Program
- Noise Exposure, Control and Hearing Conservation Program
- Nuclear Criticality Safety Program
- Personal Protective Equipment Program
- Silica Safety Program

Hazard Controls

- Elimination
 - Physically remove the hazard
- Substitution
 - Replace the hazard
- Engineering Controls
 - Isolate people from hazard - Controls include, but are not limited to, enclosures, machine guards, interlocks, worker booths, stack filters, or similar devices.
- Administrative Controls
 - Change the way people work - include, but are not limited to, documentation, training and lockout/tagout procedures.
- Personal Protective Equipment
 - Protect the worker

Pre-job Briefings

- “For moderate-hazard and high-hazard/complex activities, the PIC must perform a pre-job briefing, also referred to as a pre-job brief, with the workers immediately before beginning work or when resuming work where conditions or process parameters have or may have changed.”
- “For high-hazard/complex work activities, a pre-job briefing is required before each evolution.”
- “The pre-job briefing must be documented. The date and signature of the workers for each pre-job briefing must be captured. The workers signature validates their agreement with the IWD and confirms worker authorization, qualifications, and fitness to perform the work.”

Work Pause / Stop authority

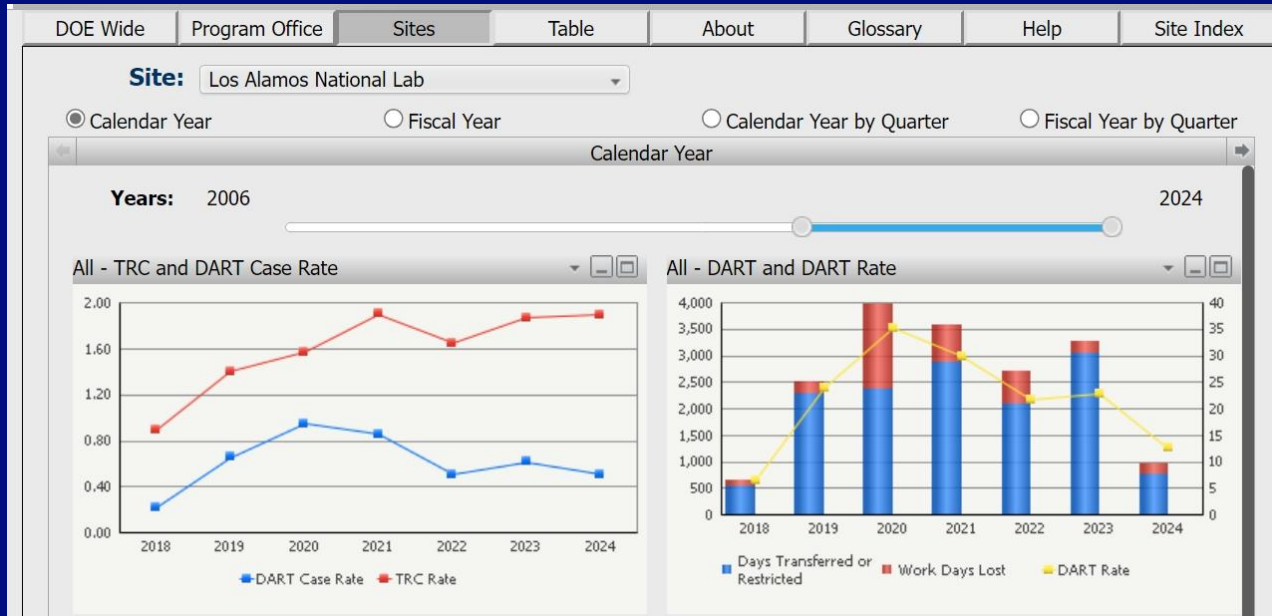
- “All workers have the right to pause and stop work at any time when they discover that workers are exposed to conditions of imminent danger or hazards or to other concerns.”
- “A **pause work** is a simple process used to temporarily halt work so that confusions, misunderstandings, work area, work management, authorization, tool, or equipment issues may be resolved prior to proceeding. Generally, a pause work will be of a short duration and involve situations that do not constitute an immediate danger to life, safety, health, security, or the environment.”
- “A **stop-work** action is a formal suspension of work activities. Immediately stop any activity that is immediately dangerous to the life or health of the workers, the public, security, or the environment. In the event of imminent danger, anyone performing work at LANL is authorized to instruct the stop work action.”

From Lessons Learned to DOE Investigations

- “The LANL Operating Experience and Lessons Learned process provides for sharing across the institution through the use of OPEX at LANL.”
- Work Pauses
 - “On Nov. 17, 2024, the legacy cleanup contractor at the Department of Energy’s Los Alamos National Laboratory in New Mexico lifted a month-long stop work order issued after a steady drip of small mishaps, a spokesperson said Tuesday.”
 - “May 27, 2024 - A series of incidents at the Waste Isolation Pilot Plant nuclear waste repository, including contamination found on a waste drum, led to a temporary pause of operations in the last month.”
- DOE Federally Led Accident Investigation Reports
 - “On August 14, 2023, an Accident Investigation Board Chairperson was appointed to investigate the accident that occurred during tree limb removal activities on the Oak Ridge Reservation site on August 11, 2023.”
 - “Accident Investigation of the May 25, 2023, Ironworker Fall Injury at the Fermi National Accelerator Laboratory Proton Improvement Plan – II Construction Project”
- <https://www.energy.gov/ehss/listings/federally-led-accident-investigation-reports>

Safety Statistics

- “The Total Recordable Case (TRC) and Days Away, Restricted, or Transferred (DART) rates are two of the most used safety performance metrics in the Department of Energy (DOE) enterprise.”
- <https://www.energy.gov/ehss/dashboards>



DOE Office of Enforcement

- “The Department of Energy's (DOE) Office of Enforcement promotes overall improvement in the Department's safety and security programs through management and implementation of the DOE enforcement programs for safety and information security that are authorized by the Atomic Energy Act. The office conducts enforcement investigations using systematic enforcement practices to thoroughly evaluate operational events and conditions that represent potentially serious violations of the Department's nuclear safety, worker safety and health, and classified and sensitive information security regulations. These investigations can result in civil penalties against DOE contractors that violate the regulations.”
- “The Office of Worker Safety and Health Enforcement implements the Department's worker safety and health enforcement program in accordance with 10 CFR 851 as authorized by the Atomic Energy Act.”
- <https://www.energy.gov/ea/enforcement-infocenter>

Defense Nuclear Facilities Safety Board (dnfsb.gov)

- “The Congress established the Board in September 1988 in response to growing concerns about the level of health and safety protection that DOE was providing the public and workers at defense nuclear facilities.”
- “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.”
- “The DNFSB has resident inspectors at Hanford, Lawrence Livermore, Los Alamos, Pantex, Savannah River Site, and the Y-12 National Security Complex.”

Price Anderson Act Amendment (PAAA)

- “The Price-Anderson Act (PAA) provides a system of financial protection for persons who may be liable and persons who may be injured by a nuclear incident. The Department of Energy (DOE) is authorized to administer the PAA system of financial protection with respect to DOE contractual activities.”
- “The 1988 Price-Anderson Act Amendments (PAAA) grant DOE authority to impose civil penalties for violations of nuclear safety requirements by indemnified contractors, subcontractors and suppliers. This authority has proven to be a valuable tool for increasing the emphasis on nuclear safety and enhancing the accountability of DOE contractors.”

Battelle SCoR

- The Battelle Memorial Institute (Columbus, OH) - nonprofit charitable trust
 - Part of the management team of 9 national laboratories: Brookhaven National Lab, Idaho National Lab, Lawrence Livermore National Lab, Los Alamos National Lab, National Renewable Energy Lab, Oak Ridge National Lab, Pacific Northwest National Lab, Savannah River National Lab, and National Biodefense Analysis & Countermeasures Center (Department of Homeland Security). Approximate workforce of 40,000.
- Battelle Safe Conduct of Research (SCoR) principles:
 - Everyone is personally responsible for ensuring safe operations.
 - Leaders value the safety legacy they create in their discipline.
 - Staff raise safety concerns because trust permeates the organization.
 - Cutting-edge science requires cutting-edge safety.
 - A questioning attitude is cultivated.
 - Learning never stops.
 - Hazards are identified and evaluated for every task, every time.
 - A healthy respect is maintained for what can go wrong.

Acknowledgments

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