

Acronyms and Glossary

Acronyms

10 CFR 830	Title 10, Code of Federal Regulations, Part 830, <i>Nuclear Safety Management</i>
ARIES	Advanced Recovery and Integrated Extraction System
CD	Critical Decision
CMR	Chemistry and Metallurgy Research Facility
CMRR	Chemistry and Metallurgy Research Replacement Nuclear Facility
CRS	Congressional Research Service
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DSA	Documented Safety Analysis
ESS	Evaluation of the Safety of the Situation
FSS	Fire Suppression System
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
MAR	Material-at-Risk
MRR	Material Recycle and Recovery
NASA	National Aeronautics and Space Administration
NDAA	National Defense Authorization Act
NNSA	National Nuclear Security Administration
PC	Performance Category
PF-4	Plutonium Facility, Building 4
PISA	Potential Inadequacy of the Safety Analysis
POC	Pipe Overpack Container
RANT	Radioassay and Nondestructive Testing Facility
RNS	Remediated Nitrated Salt-Bearing Waste
SC	Safety Class
SS	Safety Significant
SNM	Special Nuclear Material
SSCs	Structures, Systems, and Components
TA	Technical Area
TRP	Technical Area 55 Reinvestment Project
TRU	Transuranic
TWF	Transuranic Waste Facility
USQ	Unreviewed Safety Question
WETF	Weapons Engineering Tritium Facility
WIPP	Waste Isolation Pilot Plant

Glossary

Administrative Control: Safety controls or measures that rely on worker actions as opposed to engineered systems, structures, and components.

Conduct of Operations (ConOps): Implementing disciplined and structured operations that support mission success. In other words, a way of ensuring work is performed in a formalized manner that minimizes errors.

Column Capital: The enlarged portion of a structural concrete column near the top that connects with the slab above it.

Compensatory Measure: A temporary safeguard designed to approach equivalent protection when a safety system or control has failed or a new requirement or deficiency has been identified.

Damage Ratio: The fraction of material that is actually affected by the accident-generating conditions.

Deficiency: A failing or shortcoming of a safety system or control.

Department of Energy Standard 5506: A Department of Energy standard that provides contractors with guidance on how to analyze and control hazards related to transuranic waste.

Design Basis/Evaluation Basis: The set of requirements that bound the design of structures, systems, and components within the facility.

DNFSB/TECH-43: A DNFSB Technical Report, entitled *Deficiencies in DOE Standard 5506-2007*, sent to the Department of Energy in March 2018. This report identified deficiencies in DOE Standard 5506, which governs the safety bases of transuranic waste facilities.

DNFSB/TECH-44: A DNFSB Technical Report, entitled *Los Alamos National Laboratory Plutonium Facility Leak Path Factor Methodology*, sent to the Department of Energy in November 2019. The report identified concerns with the methodology used to estimate the amount of radioactive material that could escape from the Plutonium Facility during postulated accidents.

DNFSB/TECH-46: A DNFSB Technical Report, entitled *Potential Energetic Chemical Reaction Events Involving Transuranic Waste at LANL*, sent to the Department of Energy. This report discussed transuranic waste storage, handling, and processing at LANL at Los Alamos National Laboratory.

Exigent Circumstances: A Department of Energy process to systematically examine the acceptance of risk in cases where safety-class controls are not viable to reduce the offsite dose below 25 rem.

Evaluation Guideline: 25 rem total effective dose to the offsite public. In the safety analysis, the Department of Energy performs evaluations against this criterion for doses of ionizing radiation. The Evaluation Guideline is established for the purpose of identifying the need for safety-class structures, systems, and components.

Hazard Category: The hazard category for a facility is based on an unmitigated release of available hazardous material. Unmitigated is meant to consider material quantity, form, location, dispersibility, and interaction with available energy sources, but not to consider safety features that will prevent or mitigate the release.

Hazard Category 2: The hazard analysis for a Hazard Category 2 facility shows the potential for significant on-site consequences based on the quantity of material-at-risk and potential for criticality accidents.

Heat-Source Plutonium: A specific form of plutonium used by both DOE and NASA. The consequences of an accident involving heat-source plutonium could be up to 200 times worse to individuals than the plutonium involved in pit manufacturing.

Inventory: A complete list of the nuclear material within a nuclear facility.

Leak Path Factor: In an accident scenario, the LPF is the fraction of airborne material that exits the building.

Major Modification: Modification to a Department of Energy nuclear facility (after April 9, 2001) that substantially changes the existing safety basis for the facility.

Material-at-Risk: The quantity of nuclear material susceptible to a release during an accident scenario.

Performance Category: The Department of Energy's system for the graded approach to design and analyze systems, structures, and components to withstand natural phenomena hazards (e.g., earthquakes, high winds, floods). Higher performance category structures, systems, and components are designed and evaluated to consider less frequent, but more severe natural phenomena hazards events and use more conservatism for engineering calculations and quality assurance.

Performance Category-2: PC-2 structures, systems, and components are meant to ensure the operability of safety-significant systems to protect the worker and contribute to protecting the public. Design of PC-2 SSCs use commercial methods that provide performance similar to hospitals and other emergency facilities.

Performance Category-3: PC-3 structures, systems, and components are meant to ensure the operability of safety-class systems to protect public safety. Credited safety class controls are designed and evaluated to PC-3 criteria using nuclear industry codes and standards at the highest levels of quality assurance.

PF-4: Located within LANL TA-55, PF-4 began operations in 1978. PF-4 is the only fully operational, full capability plutonium facility in the nation. It supports pit manufacturing, surveillance, and plutonium recovery; as well as basic and applied research in plutonium and actinide chemistry; nuclear materials separation, processing, and recovery; plutonium metallurgy, preparation, casting, fabrication, and recovery; machining and metallurgy; and destructive and nondestructive analysis.

Plutonium-239 Equivalent Curies (PE-Ci): The hypothetical amount of plutonium-239 that would cause the same inhalation radiation dose as the actual on-site inventory, which may consist of several different radionuclides.

Redundancy, Diversity, and Physical Separation: Features required for a safety-class system:

- (1) Redundancy, where there are multiple components in case one were to fail;
- (2) Diversity, where there is a mix of different types of components; and
- (3) Physical separation of subsystems to minimize risk of damage from one event.

In this way, any single failure of a component, or a common-cause failure of a single type of component, would not cause the entire system to fail to perform its function.

Safety Basis: Describes the nuclear facility hazards that may affect the workers and offsite public. The safety basis defines the safety related equipment, procedures, and practices relied on to adequately control those hazards.

Safety-Class: Structures, systems, and components including portions of process systems, whose preventative and mitigative function is necessary to limit radioactive material exposure to the public, as determined from safety analyses.

Safety-Significant: Structures, systems, and components that are not designated as safety class SSCs, but whose preventative or mitigative function is a major contributor to worker safety as determined from safety analyses.

Source Term: The amount of radioactive or other hazardous material that is released as a result of a postulated accident scenario.

Specific Administrative Control: An administrative control that is identified and credited to prevent or mitigate a hazard or accident scenario.

Special Nuclear Material: Plutonium, uranium-233, or uranium enriched in the isotopes uranium-233 or uranium-235.

Technical Safety Requirements: A document that defines the envelope to safely operate a nuclear facility, including the parameters for safety systems, structures, and components; and administrative controls.

Total Effective Dose: A measure of radiological risk that is based on the sum of the dose from external sources of ionizing radiation and the 50-year committed dose from radioactive material taken into the body.

Transuranic Waste: Radioactive waste containing elements higher in atomic number than uranium greater than a concentration specified by federal law.

War Reserve: A war reserve pit is one that has been accepted for use in the nuclear stockpile, as distinct from developmental or production prove-in pits.