

**U.S. Department of Energy**  
**Washington, D.C.**

**ORDER**

**DOE O 452.4A**

Approved: 12-17-01  
Sunset Review: 12-17-03  
Expiration: 12-17-05

**SUBJECT: SECURITY AND CONTROL OF NUCLEAR EXPLOSIVES AND NUCLEAR WEAPONS**

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1. **OBJECTIVES.**

- a. Establish Department of Energy (DOE), including National Nuclear Security Administration (NNSA), requirements and responsibilities to prevent the deliberate unauthorized use (DUU) of U.S. nuclear explosives and U.S. nuclear weapons.
- b. Support the maintenance of a research and development (R&D) program on a broad range of security and control methods and devices for nuclear explosives and nuclear weapons.
- c. Require development of methods to maintain and regain control of all nuclear explosives and nuclear weapons during all phases of their life cycles.
- d. Ensure protection of public health and safety in conjunction with the Department of Defense (DoD) through continuation of dual-agency judgment and responsibility for the surety of nuclear weapons.
- e. Require the development, implementation, and maintenance of an integrated system of controls to protect all nuclear explosives and nuclear weapons in the custody of the DOE against DUU.

2. **CANCELLATION.** This Order cancels DOE O 452.4, *Security and Control of Nuclear Explosives and Nuclear Weapons*, dated 6-5-97. Cancellation of an Order does not, by itself, modify or otherwise affect any contractual obligation to comply with the Order. Canceled Orders that are incorporated by reference in a contract will remain in effect until the contract is modified to delete the reference to the requirements in the canceled Orders.

3. **APPLICABILITY.**

- a. **DOE Elements.** This Order applies to all DOE elements, including NNSA, involved in the Nuclear Explosive and Weapon Surety (NEWS) Program (reference DOE O 452.1B, *Nuclear Explosive and Weapon Surety Program*, dated 8-6-01).

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**DISTRIBUTION:**  
All Departmental Elements

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**INITIATED BY:**  
Deputy Administrator for Defense Programs

- b. Contractors. Contractor requirements are given in the Contractor Requirements Document (CRD), Attachment 1. Contractors with the CRD incorporated into their contracts are responsible for compliance with the requirements of the CRD to the extent mandated in the contract. Regardless of the performer of the work, contractors with the CRD incorporated into their contracts are responsible for compliance with the requirements of the CRD. Affected contractors are responsible for flowing down the requirements of the CRD to subcontracts at any tier to the extent necessary to ensure contractors' compliance with the requirements.

#### 4. REQUIREMENTS.

- a. The Nuclear Explosive and Weapon Security and Control Program (hereafter known as the Program) comprises an integrated system of devices, design techniques, and other methods to maintain control of nuclear explosives and nuclear weapons at all times. These use control measures allow use when authorized and directed by proper authority and protect against DUU. Major elements of the Program include the following:
  - (1) Personnel Assurance Program rule, Title 10 Code of Federal Regulations (CFR) Part 711, to ensure the reliability of DOE and contractor employees who require access to nuclear explosives or nuclear weapons;
  - (2) use control measures for nuclear explosives and nuclear weapons, including design features that are incorporated and used at the earliest practical point during assembly and removed at the latest practical point during disassembly or dismantlement; and
  - (3) measures to assist the recapture or recovery of lost or stolen nuclear explosives or nuclear weapons.
- b. DOE will conduct R&D for use control measures that can protect against DUU of nuclear explosives and nuclear weapons. These must be evaluated by the design and project teams for incorporation into the nuclear weapon stockpile.
  - (1) Use control or use denial improvement options, providing delay or denial capability that, at a minimum, is equivalent to that associated with current nonviolent disablement systems, will be implemented during new weapon development programs that are directed by the President and will be addressed during stockpile life extension programs. The objective of such improvements is to minimize the overall risk of DUU by providing an integrated adversary delay or denial capability for the overall nuclear weapon system that either is inherent in the design or does not require human intervention.

- (2) Nuclear weapon design features will support secure critical command and control communications whenever practical.
  - (3) Technologies to aid in the recapture and recovery of weapons, in the event physical control is lost, will be demonstrated and evaluated for integration in DOE nuclear weapon operations. The objective of improvements to recapture and recovery capabilities will be to minimize the overall DUU risk associated with the weapons.
- c. All DOE nuclear explosive operations will meet the following qualitative surety standards to prevent deliberate unauthorized nuclear detonation, fissile material dispersal from the pit, or loss of control. There will be controls to—
  - (1) minimize the possibility of or delay deliberate unauthorized nuclear detonation and
  - (2) minimize the possibility of deliberate unauthorized acts that could lead to high-explosive deflagration or high-explosive detonation.
- d. Control criteria and methods, determined by Defense Programs/NNSA to be appropriate, will be integrated into the process design for nuclear explosive operations.
- e. DUU evaluations will be performed and may be specific to a DOE nuclear explosive, nuclear explosive operation, class of operations, or a facility or site. The evaluations will address DOE nuclear explosive operations to help ensure that controls are adequate to meet the surety standards given in paragraph 4c. These controls will be periodically evaluated at the direction of the operations office manager against all existing and emerging threats and technological advancements.
- f. DOE will cooperate with DoD and other Federal agencies as required to provide protection against DUU and to assess the effectiveness of surety features for all U.S. nuclear weapon systems throughout their life cycles.
- g. DOE will assist DoD in designating nuclear command and control critical equipment and components to ensure these items are developed and maintained to meet the criteria designated in National Security Decision Directive 281.
- h. The operations offices having weapons responsibility will present an annual program review to the Assistant Deputy Administrator for Military Application and Stockpile Operations. These reviews will fulfill the requirements of the appraisal process as defined in the DOE NEWS Program and will cover—

- (1) relevant ongoing activities;
- (2) future plans and projects;
- (3) resource requirements, including the resources necessary to implement and administer this Order; and
- (4) major concerns and issues.

5. RESPONSIBILITIES.

a. Deputy Administrator for Defense Programs.

- (1) Recommends and implements DOE policy concerning DUU of nuclear explosives and nuclear weapons in DOE custody.
- (2) With DoD, ensures dual-agency oversight of the surety of nuclear explosives and nuclear weapons.

b. Assistant Deputy Administrator for Research, Development and Simulation.  
Allocates R&D resources and directs R&D of controls to prevent DUU of nuclear explosives and nuclear weapons.

c. Assistant Deputy Administrator for Military Application and Stockpile Operations.

- (1) Establishes and oversees all aspects of the Program.
- (2) Establishes programs for coordinating and assisting DoD and other Federal agencies in the recapture and recovery of nuclear explosives or nuclear weapons for which physical control has been lost.
- (3) Represents DOE regarding nuclear weapons and nuclear weapon systems control to DoD and other Federal agencies.
- (4) Assists DoD and other Federal agencies in designating nuclear command and control critical equipment and ensuring that it is developed to meet criteria specified in the National Security Decision Directive 281.
- (5) Directs assessment of the effectiveness of control features of nuclear weapons in DOE and DoD custody.
- (6) Establishes programs to incorporate improved use control measures in the stockpile and promotes those programs found to be cost effective and feasible.

- (7) Creates and sustains technical evaluation panels as needed to consider and assess control issues and to make programmatic recommendations to the Assistant Deputy Administrator for Military Application and Stockpile Operations.
- (8) In coordination with the DOE Director of Security Affairs, ensures proper integration of safety and use control with security.

d. Director, Office of Security Affairs.

- (1) Develops and establishes policies for the safeguards and security of nuclear explosives and nuclear weapons and their components.
- (2) Directs evaluation of physical protection technology and equipment to meet present and future safeguards and security requirements for nuclear explosives and nuclear weapons.
- (3) Advises the Assistant Deputy Administrator for Military Application and Stockpile Operations on safeguards and security requirements to implement the security element of the surety standards as defined in the DOE NEWS Program.
- (4) Represents DOE safeguards and security policy to DoD and other Federal agencies.
- (5) Establishes the safeguards and security programs and policies for coordinating with DoD and other Federal agencies in the recapture and recovery of nuclear explosives or nuclear weapons.

e. Managers of DOE Operations Offices.

- (1) Ensure implementation of the Program.
- (2) Conduct an annual Program review for the Assistant Deputy Administrator for Military Application and Stockpile Operations and other DOE senior-level managers.
- (3) Assess the effectiveness of the integrated system of controls to protect nuclear explosives under their cognizance against DUU.
- (4) Certify to the Assistant Deputy Administrator for Military Application and Stockpile Operations that all nuclear explosive operations under their cognizance meet the surety standards in paragraph 4c of this Order and specify the basis for making this certification. Specification may be by

reference to other documents that do not need to be included in the certification memorandum.

- f. Director, Office of Independent Oversight and Performance Assurance. Conducts safeguards and security inspections to ensure the effectiveness of physical security measures.

6. DEFINITIONS. See Attachment 2.

7. REFERENCES.

- a. Personnel Assurance Program rule, 10 CFR 711, the rule that defines a voluntary human reliability program and provides requirements and responsibilities for selecting and continuously evaluating personnel performing nuclear explosive operations.
- b. National Security Decision Directive 281, Nuclear Weapons Command and Control (U), dated 8-21-87 (Top Secret), which provides the basis for the attainment and maintenance of a nuclear command and control system under the authority and direction of the Commander in Chief.
- c. National Security Decision Directive 309, Nuclear Weapons Safety, Security, and Control (U), dated 6-27-88 (Confidential), which defines the joint dual-agency surety responsibilities between DoD and DOE to protect the public health and safety.
- d. Joint Policy Statement on Nuclear Weapons Surety, dated 6-27-91, signed by the Secretaries of Defense and Energy.
- e. Memorandum of Understanding Between the Department of Defense and Department of Energy on Objectives and Responsibilities for Joint Nuclear Weapon Activities, dated 1-17-83, which supplements previous agreements delineating DoD and DOE objectives, responsibilities, and measures to improve stockpile planning and acquisition and ensuring high-level attention to nuclear weapon safety, security, and control.
- f. DOE O 151.1A, *Comprehensive Emergency Management System*, dated 11-1-00, which establishes objectives, responsibilities, and requirements for a system that encompasses emergency planning, preparedness, readiness assurance, response, and recovery actions.
- g. DOE O 200.1, *Information Management Program*, dated 9-30-96, and National Archives and Record Administration-approved DOE records schedules, which describe requirements for managing records related to this program.

- h. DOE O 452.1B, *Nuclear Explosive and Weapon Surety Program*, dated 8-6-01, which establishes DOE objectives, standards, criteria, authorities, and responsibilities for the Nuclear Explosive and Weapon Surety Program.
- i. DOE O 452.2B, *Safety of Nuclear Explosive Operations*, dated 8-7-01, which establishes DOE objectives, requirements, and responsibilities for the safety of DOE nuclear explosive operations.
- j. DOE O 461.1, *Packaging and Transfer or Transportation of Materials of National Security Interest*, dated 9-29-00, which establishes the DOE requirements and responsibilities and implements the management and operation of the Transportation Safeguards System.
- k. DOE O 470.1, *Safeguards and Security Program*, dated 9-28-95, which establishes basic requirements and responsibilities for the DOE Safeguards and Security Program.
- l. DOE O 470.2A, *Security and Emergency Management Independent Oversight and Performance Assurance Program*, dated 3-1-00, which establishes the DOE Security and Emergency Management Independent Oversight and Performance Assurance Program that provides DOE and contractor managers, Congress, and other stakeholders an independent evaluation of the effectiveness of DOE safeguards and security policy and programs and the implementation of these policies and programs.
- m. DOE O 473.2, *Protective Force Program*, dated 6-30-00, which establishes policy, requirements, responsibilities, and authorities for the management and operation of the DOE Protective Force Program.
- n. DOE 5530.1A, *Accident Response Group*, dated 9-20-91, which establishes DOE policy for response to accidents and significant incidents involving nuclear weapons or nuclear weapon components.
- o. DOE 5530.2, *Nuclear Emergency Search Team*, dated 9-20-91, which establishes DOE policy for Nuclear Emergency Search Team operations in response to malevolent radiological incidents.
- p. DOE 5610.13, *Joint Department of Energy/Department of Defense Nuclear Weapon System Safety, Security, and Control Activities*, dated 10-10-90, which establishes DOE policy, procedures, authorities, and responsibilities for joint nuclear weapon and nuclear weapon system safety, security, and control activities in conjunction with DoD.

- q. DOE 5632.1C, *Protection and Control of Safeguards and Security Interests*, dated 7-15-94, which establishes policy, authorities, and responsibilities for the protection and control of safeguards and security interests.
  - r. DOE M 5632.1C-1, *Manual for Protection and Control of Safeguards and Security Interests*, dated 7-15-94, which provides detailed requirements for protection and control of safeguards and security interests applicable to the design, modification, and/or operation of DOE facilities.
8. CONTACT. Office of Nuclear Weapons Surety, 301-903-3463.

BY ORDER OF THE SECRETARY OF ENERGY:



FRANCIS S. BLAKE  
Deputy Secretary



## **CONTRACTOR REQUIREMENTS DOCUMENT**

### **DOE O 452.4A, *Security and Control of Nuclear Explosives and Nuclear Weapons***

Regardless of the performer of the work, the contractor is responsible for compliance with the requirements of this Contractor Requirements Document (CRD). The contractor is responsible for flowing down the requirements of this CRD to subcontracts at any tier to the extent necessary to ensure the contractor's compliance with the requirements.

The nuclear weapons design laboratories (Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and Sandia National Laboratories) will conduct research and development on a broad range of security and control methods and devices for nuclear explosives and nuclear weapons.

Contractors must comply with the following:

1. Provide support to the Nuclear Explosive and Weapon Security and Control Program.
2. Maintain records according to National Archives and Records Administration-approved Department of Energy or site-specific records retention schedules.

## DEFINITIONS

1. Deliberate Unauthorized Act (DUA). Any intentional action that has not been authorized and approved by proper authority. In the context of the third nuclear explosive surety standard, a DUA is one that is not sanctioned as part of an approved nuclear explosive operation or associated activity, but which could affect a nuclear explosive or main charge high-explosive part collocated with a pit. From a use control perspective, such an act is of interest if performed with intent to create a nuclear detonation or to gain unauthorized control of a nuclear explosive.
2. Deliberate Unauthorized Use (DUU). Any of the following consequences resulting from deliberate malevolent acts:
  - a. a nuclear detonation not authorized by the National Command Authorities,
  - b. a high-explosive detonation or deflagration that could have resulted in an unauthorized nuclear detonation or fissile material dispersal from a pit, or
  - c. theft of nuclear explosives.
3. Nuclear Command and Control Critical Equipment. Specifically designated equipment, including software, used to build, encode, decode, transmit, or receive emergency action messages; identify nuclear targets, select nuclear weapons to be used against specific targets, and route nuclear-weapons-carrying platforms to appropriate launch points; and support or inhibit the delivery, arming, fusing, and firing of nuclear weapons themselves. Includes positive control material and devices and nuclear weapons hardware.
4. Nuclear Weapon System. A nuclear weapon and the intended means for delivering it to a target. Includes associated support equipment, noncombat delivery vehicles, facilities, procedures, and personnel.
5. Production Agencies. DOE management and operating contractors responsible for assembling or disassembling nuclear explosives, components of nuclear explosives, or nuclear explosive-like assemblies.
6. Recapture. Locating and/or regaining control of a nuclear weapon and/or special nuclear material that is under unauthorized possession while still within the confines of a DOE site/facility.
7. Recovery. Locating and/or regaining control of a nuclear weapon and/or special nuclear material that is under unauthorized possession and has been removed from within the confines of a DOE site/facility or DOE possession.

8. Use Control. The application of systems, devices, or procedures that allow timely authorized use of a nuclear explosive while precluding or delaying deliberate unauthorized nuclear detonation.
9. Use Denial. The use control measures that, given access, delay or prevent an unauthorized nuclear detonation.

NOTE: DOE O 452.1B, *Nuclear Explosive and Weapon Surety Program*, dated 8-6-01, and DOE O 461.1, *Packaging and Transfer or Transportation of Materials of National Security Interest*, dated 9-29-00, provide definitions of other terms used in this Order.

CANCELED