

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

ORDER

DOE O 461.2A

Approved: 08-05-2026

**SUBJECT: ONSITE PACKAGING AND TRANSFER OF MATERIALS OF NATIONAL
SECURITY INTEREST**

1. PURPOSE. This Order establishes safety requirements and responsibilities for onsite packaging and transfer of Materials of National Security Interest (MNSI). It ensures safe use of Transportation Safeguards System (TSS) and non-TSS government- and contractor-owned or leased resources, and establishes a risk-informed process for identifying and mitigating risks associated with non-compliant transfers. United States (U.S.) Department of Energy (DOE) authority for these requirements derives from the Atomic Energy Act of 1954, as amended.
2. CANCELS/SUPERSEDES. DOE Order (O) 461.2, *Onsite Packaging and Transfer of Materials of National Security Interest*, dated November 1, 2010.

Cancellation of a directive does not, by itself, modify or otherwise affect any contractual or regulatory obligation to comply with the directive. Contractor Requirements Documents (CRDs) that have been incorporated into a contract remain in effect throughout the term of the contract unless and until the contract or regulatory commitment is modified to either eliminate requirements that are no longer applicable or substitute a new set of requirements.

3. APPLICABILITY.
 - a. Departmental Applicability. Except for the equivalencies and exemptions in section 3.c., this Order applies to Departmental elements responsible for onsite transfer of MNSI. This Order complements DOE O 460.1, *Hazardous Materials Packaging and Transportation Safety*, current version, which applies to onsite transfers of radioactive and hazardous materials other than MNSI. The Administrator of National Nuclear Security Administration (NNSA) must assure that NNSA employees comply with their responsibilities under this Order. Nothing in this Order may be construed to interfere with the NNSA Administrator's authority under section 3212(d) of Public Law P.L. 106-65, National Defense Authorization Act for Fiscal Year 2000.
 - b. DOE Contractors. The requirements of this Order shall be incorporated into applicable contracts, including Management and Operating contracts. The contractor is responsible for flowing down the requirements of this CRD, if applicable. Contractors shall comply with the requirements of applicable federal, state, and local laws and regulations in carrying out the requirements of this Order unless relief has been granted in writing. Omission of any applicable law or regulation from the Order does not affect the obligation of the contractor to comply with such law or regulation. Contractors must comply with the

requirements of this Order, except to the extent modified by the equivalencies or exemptions identified herein or issued to the contractor in writing by DOE utilizing the process outlined in DOE O 251.1E, *Departmental Directives Program*, including as amended or updated.

c. Equivalencies/Exemptions for DOE O 461.2A. This Order does not apply to the following:

- (1) Exemptions. Exemptions may be granted if they do not violate legal requirements or pose undue risks to security, public health and safety, workers, or the environment. Exemption requests must be submitted in writing by the responsible DOE Field Organization to the Deputy Administrator for Defense Programs for review and submission to the Administrator, NNSA, for approval. Decisions must be set forth in writing stating the reasons for granting or denying the exemption.
- (2) Equivalency. Activities under the cognizance of the Deputy Administrator for Naval Reactors, as determined appropriate for consistency within the joint Navy/DOE Naval Nuclear Propulsion Program, pursuant to Executive Order 12344, Naval Nuclear Propulsion Program, codified at 50 U.S.C. §§ 2406, Deputy Administrator for Naval Reactors, and 2511, Naval Nuclear Propulsion Program.
- (3) Equivalency. Onsite transfers using TSS resources that comply with the TSS safety basis.

4. REQUIREMENTS.

- a. Packaging and Transfer Procedures. Each site must maintain and implement a set of packaging and transfer procedures approved by the appropriate authority to ensure onsite transfers comply with the requirements of this Order. Transfer authorization is governed by the applicable Transportation Safety Document (TSD). Contractors must not commence non-compliant transfer operations until all TSD or Documented Safety Analysis (DSA) approvals have been granted and approved packaging procedures are in place.
- b. Transfer Authorization. Compliant transfers of MNSI do not require special authorization. Non-compliant transfers must be authorized through a DOE-issued TSD Safety Evaluation report (SER).
 - (1) Compliant Transfers. Compliant packages must be used. Type A(F) or Type B quantities of radioactive material must be packaged in a DOE, NNSA, or Nuclear Regulatory Commission (NRC) certified package in accordance with the applicable Certificate of Compliance (CoC) or Offsite Transportation Certificate (OTC). Transfer operations must comply with the requirements and standards in the Department of Transportation (DOT) regulations (49 Code of Federal Regulations [CFR] §§ 171–180 and 350–399).

- (2) Non-Compliant Transfers. Non-compliant transfers must be authorized by an approved TSD or an approved safety basis. The TSD establishes the approved safety envelope for packaging and transfer operations. When approved by a SER, the TSD satisfies the requirements of Attachment 3 and/or 10 CFR § 830, Nuclear Safety Management, Appendix A to Subpart B. Non-compliant transfers evaluated as part of a DOE-approved Safety Basis per 10 CFR § 830, Appendix A to Subpart B, Section F, do not require a separate TSD.
- c. Review and Approval. A DOE team reviews the TSD and makes recommendations to the responsible Field Organization Manager for approving non-compliant transfer documentation.
- d. Quality Assurance. Packaging and transfer activities must comply with DOE O 414.1, *Quality Assurance*, current version. Each site must maintain a compliant Quality Assurance Program for the packaging and transfer of MNSI. Compliant transfers of Type A(F) or Type B quantities of radioactive and fissile material must be conducted in accordance with a quality assurance plan meeting the requirements of 10 CFR § 71, Subpart H.
- e. Transfer Operations.
 - (1) Each compliant transfer must be prepared and conducted in accordance with 49 CFR § 171–180, Hazardous Materials Regulations.
 - (2) All transfer activities performed under the TSS must be conducted according to 10 CFR § 830.
 - (3) Government or contractor vehicles (owned or leased) must be operated in compliance with 49 CFR § 350–399, Federal Motor Carrier Safety Regulations.
 - (4) All non-compliant transfers must be performed under the purview of an approved TSD or a DOE-approved safety basis.
 - (5) Transfer of nuclear explosives must meet the requirements of DOE O 452.1 *Nuclear Explosive and Weapon Surety Program*, current version, and DOE O 452.2, *Nuclear Explosive Safety*, current version.
 - (6) Contractors must analyze packages to support onsite transfers.
 - (7) Contractors must maintain current copies of TSDs, DSAs, OTCs, DOE and/or NRC CoCs, and associated SERs, safety analysis reports for packaging (SARPs), and other supporting documents applicable to their operations. Copies must be retained for 3 years beyond the last activity.

- f. Scheduling TSS Transfers. If TSS resources are required for onsite transfers, secure-transportation shipping requirement forecasts must be developed for the Assistant Deputy Administrator for Secure Transportation. See DOE O 461.1, *Packaging and Transportation for Offsite Shipment of Materials of National Security Interest*, current version, for requirements and the process to request and schedule TSS resources.
 - g. Training. All personnel who manage, supervise, support, and/or perform packaging and transfer operations must be appropriately trained and qualified to perform their assigned functions. Training must include hazardous materials training requirements of 49 CFR § 172.704, Training requirements. Motor vehicle drivers must also be trained and qualified per 49 CFR § 391.11, General qualifications of drivers. Qualification standards for personnel with oversight responsibilities must be established and maintained consistent with applicable DOE oversight policy. Auditable training records must be maintained.
 - h. Documents and Records. Documents and records specified in this Order must be maintained according to DOE and National Archives and Records Administration-approved records retention and disposition schedules.
 - i. Oversight. Oversight must be performed on packaging and transfer operations implementing this Order. Oversight programs must be developed, implemented, and documented consistent with DOE O 226.1, *Implementation of Department of Energy Oversight Policy*, current version.
5. RESPONSIBILITIES. Under Secretary for Nuclear Security and Administrator (NNSA).
- a. Ensure implementation and execution of requirements and responsibilities in accordance with this Order.
 - b. Grant or deny requests for exemptions to this Order.
 - c. Principal Deputy Administrator. Recommend requests for Order exemptions to the Administrator.
 - d. Associate Principal Deputy Administrator. Advise the Principal Deputy Administrator on nuclear safety issues related to requests for exemptions to this Order.
 - e. Deputy Administrator for Defense Programs.
 - (1) Assign line management responsibilities.
 - (2) Provide overall management and policy direction for NNSA packaging activities and conduct of TSS operations.
 - (3) Review Field Organization Manager exemption requests and forwards with recommendation to the Principal Deputy Administrator and Administrator, NNSA.

f. Associate Administrator for Environment, Safety, and Health.

- (1) Coordinate with appropriate DOE organizations in the development of standards and directives for onsite transfers.
- (2) Coordinate with appropriate DOE organizations in the development of packages that may fulfill requirements for organizations outside of NNSA.
- (3) Advise the Deputy Administrator for Defense Programs on nuclear safety requirements for packaging and transfer of MNSI.
- (4) Perform packaging and transfer line management oversight focused on NNSA field elements and assess contractor activities as needed to evaluate the implementation and effectiveness of Field Element oversight.
- (5) Provide guidance to field organizations and contractors preparing TSDs.
- (6) Approve and issue OTCs for packages used to transfer MNSI.
- (7) Maintain copies of all currently approved NNSA SARPs, OTCs, SERs, and supporting documentation.
- (8) Authorize users of NNSA-certified Type B packages and revoke authorized user status for non-compliance with OTC requirements.
- (9) Review and approve 10 CFR § 71, Packaging and Transportation of Radioactive Material, Subpart H, "Quality Assurance."

g. Field Office Managers.

- (1) Approve SERs and TSDs.
- (2) Ensure implementation of TSDs by site contractors.
- (3) Ensure NRC, DOE, and NNSA approved Type A(F) and Type B packages used for onsite transfers comply with applicable CoCs or OTCs.
- (4) Maintain current copies of all OTCs, CoCs, SARPs, and SERs for packaging operations at their sites.
- (5) Implement an oversight program of packaging and transfer operations consistent with DOE O 226.1, current version.
- (6) Ensure DOE personnel are assigned and trained to oversee compliance with the requirements of this Order.

- (7) Notify contracting offices when this Order applies to specific contracts and ensure the CRD is incorporated as appropriate.
 - (8) Submit requests for Order exemptions to the Administrator, NNSA, through the Deputy Administrator for Defense Programs.
 - h. Assistant Deputy Administrator for Secure Transportation.
 - (1) Define frequency and content of site shipping requirement forecasts.
 - (2) Authorize the use of Office of Secure Transportation assets for onsite transfers.
 - (3) Ensure the TSS DSA includes applicable onsite transfers.
 - i. Contracting Officer. For all applicable contracts and upon notification that a site/facility management contract is affected by this Order, the Contracting Officers shall incorporate the requirements into the affected contracts via the “Laws, Regulations, and DOE Directives” clause of the contract, or through negotiation and modification, as appropriate.
- 6. INVOKED STANDARDS. This Order does not invoke any DOE technical standards or industry standards as required methods. Note: DOE O 251.1, current version, provides a definition for “invoked technical standard.”
- 7. DEFINITIONS. For DOT and NRC regulatory definitions, refer to 49 CFR § 171–180 and 10 CFR § 71, respectively. The following DOE/NNSA-specific definitions apply to this Order:
 - a. Compliant Packages. Packages meeting the relevant DOT regulations (49 CFR § 171–180), NRC regulations (10 CFR § 71), NRC/DOE CoCs, and/or NNSA OTCs.
 - b. Compliant Transfers. Onsite transfers for which both the package and transporter meet the relevant DOT regulations (49 CFR §§ 171–180 and 350–399), NRC regulations (10 CFR § 71), and applicable CoCs and/or NNSA OTCs.
 - c. Documented Safety Analysis. A documented analysis of the extent to which a nuclear facility may be operated safely with respect to the public, workers, and the environment, per 10 CFR § 830, Appendix A to Subpart B.
 - d. Exemption. A waiver of the need to comply with specific requirements in this Order. Exemptions may be granted only by the Administrator, NNSA.
 - e. Fissile Material. Plutonium-239, plutonium-241, uranium-233, uranium-235, or any combination thereof. Does not apply to unirradiated natural or depleted uranium, or natural/depleted uranium irradiated in thermal reactors only.

- f. Materials of National Security Interest. Strategic materials used in the development, testing, production, and maintenance of nuclear weapons and other materials that have been designated as critical to the national security of the United States. The Deputy Administrator for Defense Programs may designate other specific items as MNSI as necessary for the national security of the United States.
- g. Non-Compliant Packages. Packages that do not meet the definition of compliant packages as defined herein.
- h. Non-Compliant Transfers. Onsite transfers that do not meet the definition of compliant transfers as defined herein.
- i. Nuclear Component. A major subassembly of a nuclear explosive containing special nuclear material (SNM) in quantities sufficient to fuel a nuclear explosion (e.g., pit or canned subassembly). Subassemblies containing tritium but no SNM are not nuclear components.
- j. Nuclear Explosive. An assembly containing fissile and/or nuclear fusion materials and main-charge high-explosive parts or propellants capable of producing a nuclear detonation (e.g., a nuclear warhead or nuclear explosive test device).
- k. Offsite Transportation Certificate. An NNSA-prepared document, analogous to an NRC CoC, describing the compliant package configuration, authorized contents, and transportation restrictions. Issued only if 10 CFR § 71 requirements are met. May be issued for one-time use or multiple uses up to 5 years.
- l. Onsite. Any area within the boundaries of a DOE site or facility to which access is controlled.
- m. Safety Analysis Report for Packaging. A document conforming to NRC Regulatory Guide 7.9, "Standard Format and Content of Part 71 Applications for Approval of Packaging for Radioactive Material," that provides a comprehensive technical evaluation of a package, including structural, thermal, containment, shielding, and criticality evaluations. Demonstrates conformity with the relevant packaging requirements and standards of 10 CFR § 71 and 49 CFR § 171–180.
- n. Safety Evaluation Report. A document presenting the results of the TSD review panel's safety evaluation of the DSA and/or TSD.
- o. Special Assembly. An assembly of one or more nuclear components that does not constitute a complete nuclear explosive and is not capable of producing a nuclear detonation.

- p. Special Nuclear Material. Plutonium, uranium-233, uranium enriched in isotope-235, and any other material determined to be special nuclear material pursuant to 42 U.S.C. § 2071 (Section 51 of the Atomic Energy Act of 1954, as amended). Includes material artificially enriched by any of the foregoing; excludes source material.
- q. Transfer. An onsite transportation activity, including the package and transporter, occurring within a DOE site or facility.
- r. Transportation Safety Document. A DOE-approved site-specific documented safety basis manual providing guidance, control, and definitions for packaging and transfer of MNSI.
- s. Transportation Safeguards System. A DOE system managed by the Office of Secure Transportation used for the safe and secure movement of MNSI and other approved cargo, authorized under the Atomic Energy Act.

Definitions found in current directives are listed on the Directives website:

https://www.directives.doe.gov/definitions#c2=all&b_start=0.

8. REFERENCES.

- a. Title XXXII, *National Nuclear Security Administration Act*, of P.L. 106-65, as amended.
- b. DOE O 414.1, *Quality Assurance*, current version.
- c. DOE O 451.1, *National Environmental Policy Act Compliance Program*, current version.
- d. DOE O 452.1, *Nuclear Explosive and Weapon Surety Program*, current version.
- e. DOE O 452.2, *Nuclear Explosive Safety*, current version.
- f. DOE O 460.1, *Packaging and Transportation Safety*, current version.
- g. DOE O 461.1, *Packaging and Transportation for Offsite Shipment of Materials of National Security Interest*, current version.
- h. 10 CFR § 71, *Packaging and Transportation of Radioactive Material*.
- i. 10 CFR § 830, *Nuclear Safety Management*.
- j. 10 CFR § 835, *Occupational Radiation Protection*.

- k. 49 CFR § 171–180, *Pipeline and Hazardous Materials Safety Administration, Department of Transportation.*
 - l. 49 CFR § 350–399, *Federal Motor Carrier Safety Regulations, Department of Transportation.*
9. CONTACT. Questions concerning this Order should be addressed to the NNSA Facility Operations Division.



JAMES P. DANLY
Deputy Secretary

ATTACHMENT 1
PACKAGING AND TRANSFER OF MATERIALS OF NATIONAL SECURITY
INTEREST TRANSPORTATION SAFETY DOCUMENT REQUIREMENTS

1. PURPOSE. This attachment establishes minimum safety requirements for operational safety controls for onsite transfer operations and provides policy objectives for development of an onsite Transportation Safety Document (TSD) for non-compliant transfers. Compliant transfers of radioactive and hazardous materials may be conducted without special authorization or a TSD.
2. SCOPE. This attachment applies to onsite packaging and transfer activities at DOE facilities retaining and transporting Materials of National Security Interest (MNSI), pursuant to this Order.
3. GENERAL OBJECTIVES. The following general objectives apply to onsite packaging and transfer of MNSI:
 - a. Apply a graded approach to significantly reduce aggregate risk to the public, site workers, and the environment.
 - b. Develop a package evaluation program founded on the safety envelope tailored to site-specific operations.
 - c. Develop, track, revise, and evaluate onsite packaging and transfer operations in accordance with the site-approved Quality Assurance Program.
4. TRANSPORTATION SAFETY DOCUMENT.

The TSD establishes the approved safety envelope for non-compliant packaging and transfer operations. The safety envelope is defined by hazards associated with the materials, analysis of credible accident scenarios, establishment of controls for prevention and mitigation, and implementation of a safety management strategy. The TSD, when approved, satisfies the requirements of this attachment and 10 CFR § 830.204, *Documented safety analysis*, and 10 Code of Federal Regulations (CFR) § 830.205, Technical safety requirements.

 - a. The TSD, including all updates reflecting changes to transfer operations that could impact safety, must be submitted to the Field Organization Manager for approval. An analysis between the TSD and the requirements in this attachment is required during each annual update.
 - b. For transfers subject to 10 CFR 830, Subpart B, TSDs must be prepared in accordance with Attachment 2 of this Order. For transfers not subject to 10 CFR 830, Subpart B, TSDs must be prepared in accordance with Attachment 3.

- c. Transfer of Type B quantities of radioactive and fissile materials in DOE and/or National Nuclear Security Administration (NNSA) certified packages (Certificate of Compliance or Offsite Transportation Certificate) do not require NNSA TSD transfer approval.
- d. The TSD must substantiate that a credible accident would not cause individuals to receive a total effective dose greater than the public protection criteria levels referenced in DOE-Standard-1189, *Integration of Safety into the Design Process*, Appendix A. Safety documentation must demonstrate that administrative and operating controls prevent criticality events in all credible onsite transfer accidents.

5. ONSITE PACKAGING AND TRANSFER PROCEDURES.

Each facility or site must prepare onsite procedures for implementation of the TSD and/or compliant transfers. Procedures must address integrated controls, including packaging and transportation management; technical safety requirement flow-down; operating restrictions and limitations; transfer route management; package evaluation; occurrence reporting; administrative controls; training and qualification; and quality assurance.

ATTACHMENT 2
TRANSPORTATION SAFETY DOCUMENT REQUIREMENTS
FOR PACKAGING AND TRANSFER ACTIVITIES SUBJECT TO
10 CFR PART 830 SUBPART B

1. INTRODUCTION.

Each type of onsite transfer subject to 10 CFR 830, Subpart B, must be documented in an approved site-specific Transportation Safety Document (TSD). The TSD must identify responsibilities and lines of authority; identify and evaluate transfer hazards; define minimum safe package requirements; describe transfer systems and operational controls to minimize probability and consequence of credible accidents; describe the safety assessment process; describe the site and its boundaries; describe emergency response and recovery actions; and define the process for non-routine packaging and transfer activities. The TSD must be approved by the Safety Basis Approval Authority (Field Organization Manager). All onsite transfers must be conducted in accordance with the approved TSD and accompanying Department of Energy (DOE) Safety Evaluation Report (SER).

2. TSD CONTENT REQUIREMENTS.

The TSD must, at a minimum, address the following at a level of detail commensurate with the complexity of operations, types and quantities of materials, transfer routes, and hazard level:

- a. Hazard identification and analysis, including credible accident scenarios.
- b. Controls for prevention and mitigation of accident scenarios representing unacceptable risk, including containment, communication, and administrative controls.
- c. Safety management programs credited with reducing risk, including radiation protection, criticality safety, configuration management, and change control.
- d. Personnel qualification and training requirements for onsite packaging and transfer activities.
- e. Documentation and recordkeeping requirements, including retention of safety analysis reports for packaging, training records, change control documents, and vehicle inspection records.
- f. Incident reporting and emergency response plans, including lines of communication and roles and responsibilities for emergency response specific to onsite transfer.
- g. Transport vehicle operations, including vehicle maintenance and inspection processes.

3. SAFETY ASSESSMENT METHODOLOGY.

The safety assessment methodology must use a graded approach commensurate with the hazard of the material being transferred. For higher hazard (e.g., Hazard Category II) transfers, a more quantitative analysis is recommended. For lower hazard transfers, a more qualitative assessment is acceptable.

- a. A containment system must be provided for all handling, staging, and transfer configurations. Packaging must maintain containment under both normal use and credible accident conditions.
- b. Reliance on package performance is the preferred means of ensuring safety. An integrated approach combining package performance with specific communication and control measures is also acceptable.
- c. For compliant packages with established specifications and approved operating bounds, additional analysis is not required unless conditions are not bounded by existing documentation. For non-compliant packages, a detailed analysis establishing the package performance envelope is required.
- d. Controls must be commensurate with the hazard of the material being transported and must ensure the package operates within its established performance envelope. All credited controls must flow forward into applicable Technical Safety Requirements.
- e. Communication requirements must be commensurate with the hazard of the material being transferred. Following Department of Transportation control and communication requirements is an acceptable option for compliant packages.
- f. The safety assessment must conclude that the transfer system provides a level of protection commensurate with the hazard of the material being transferred.

ATTACHMENT 3
TRANSPORTATION SAFETY DOCUMENT REQUIREMENTS
FOR PACKAGING AND TRANSFER ACTIVITIES NOT SUBJECT TO
10 CFR § 830 SUBPART B

1. INTRODUCTION.

Each type of onsite transfer not subject to 10 Code of Federal Regulations (CFR) § 830, Subpart B, must comply with the principles of integrated safety management and applicable Department of Energy (DOE) Orders and regulations (e.g., 10 CFR § 835). This is documented in an approved site-specific Transportation Safety Document (TSD) that must identify responsibilities and lines of authority; identify and evaluate transfer hazards; define minimum safe package requirements; describe transfer systems and operational controls; describe the safety assessment process; describe the site and its boundaries; describe emergency response and recovery actions; and define the process for non-routine packaging and transfer activities. The TSD must be approved by the appropriate DOE risk acceptance authority as determined by the Field Organization Manager.

2. TSD CONTENT REQUIREMENTS.

The TSD must, at a minimum, address the following at a level of detail commensurate with the complexity of operations, types and quantities of materials, transfer routes, and hazard level:

- a. Hazard identification and analysis, including credible accident scenarios. This analysis may be more qualitative in nature than that described in Attachment 2.
- b. Controls for prevention and mitigation of accident scenarios with unacceptable risk, including containment, communication, and administrative controls.
- c. Safety management programs credited with reducing risk, including radiation protection, configuration management, and change control.
- d. Personnel qualification and training requirements for onsite packaging and transfer activities.
- e. Documentation and recordkeeping requirements, including retention of package documentation, training records, change control documents, and vehicle inspection records.
- f. Incident reporting and emergency response plans for the site.
- g. Transport vehicle operations, including vehicle maintenance and inspection processes.

3. SAFETY ASSESSMENT METHODOLOGY.

The safety assessment methodology must use a graded approach commensurate with the hazard of the material being transferred. For higher hazard transfers, a more quantitative analysis is recommended; for lower hazard transfers, a more qualitative assessment is acceptable.

- a. A containment system must be provided for all handling, staging, and transfer configurations. Packaging must maintain containment under both normal use and credible accident conditions.
- b. Reliance on package performance is the preferred means of ensuring safety for onsite hazardous material transfers. For transfers using compliant packages with established specifications and approved operating bounds, additional analysis is not required unless conditions are not bounded by existing documentation. For non-compliant packages or non-routine transfers, a graded safety assessment must be performed to establish the package performance envelope, applicable controls, and documentation commensurate with the hazards and complexity of the transfer.
- c. For compliant packages, following Department of Transportation control and communication requirements is an acceptable option with no further evaluation required. For non-compliant packages, controls and communication requirements must be commensurate with the hazard of the material being transported and must ensure the package operates within its established performance envelope.
- d. All credited controls maintaining the safety envelope must flow forward into applicable documented controls.
- e. The safety assessment must conclude that the transfer system provides a level of protection commensurate with the hazard of the material being transferred.