

ORDER

DOE O 461.2

Approved: 11-1-2010

ONSITE PACKAGING AND TRANSFER OF MATERIALS OF NATIONAL SECURITY INTEREST



NATIONAL NUCLEAR SECURITY ADMINISTRATION
Office of Defense Programs

ONSITE PACKAGING AND TRANSFER OF MATERIALS OF NATIONAL SECURITY INTEREST

1. **PURPOSE.** The Department of Energy (DOE) has broad authority under the Atomic Energy Act of 1954, as amended, to regulate all aspects of activities involving radioactive materials that are undertaken by DOE or on its behalf, including the onsite packaging and transfer of materials of national security interest. This Order establishes safety requirements and responsibilities for onsite packaging and transfers of materials of national security interest to ensure safe use of Transportation Safeguards System (TSS), non-TSS Government- and contractor-owned and/or leased resources. This Order also establishes a process of identifying and mitigating risks associated with non-compliant transfers.
2. **CANCELLATIONS.** DOE O 461.1A, *Packaging and Transfer or Transportation of Materials of National Security Interest*, dated 4-26-04 and DOE M 461.1-1 Admin Chg 1, *Packaging and Transfer of Material of National Security Interest*, dated 9-29-2000. DOE O 461.1B in conjunction with DOE O 461.2, cancel DOE O 461.1A and DOE M 461.1-1. 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of the contract unless and until the contract or regulatory commitment is modified to either eliminate requirements no longer applicable or substitute a new set of requirements.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 that have responsibility for activities associated with onsite transfer of materials of national security interest. This Order complements DOE O 460.1C, *Packaging and Transportation Safety*, which applies to onsite transfers of radioactive and hazardous materials, other than materials of national security interest, that are not subject to this Order.

The Administrator of the 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 to establish Administration-specific policies, unless disapproved by the Secretary.
 - b. **DOE Contractors.**
 - (1) Except for the equivalencies and exemptions noted in section 3.c., the CRD (Attachment 1) identifies the requirements of this Order that apply to contracts that include the CRD.

- (2) The CRD must be included in contracts that involve activities associated with the packaging and onsite transfer of materials of national security interest. The Field Organization Managers identified in paragraph 5.f. are responsible for notifying contracting officers when this Order applies to specific contracts. Once notified, contracting officers are responsible for incorporating the CRD into the affected contracts.

c. Equivalencies and Exemptions. This Order does not apply to the following:

- (1) Exemptions. Exemptions to this Order may be granted, provided the proposed exemptions are not prohibited by law and do not present an undue risk to security, public health and safety, workers, or the environment.
 - (a) Requests for Order exemptions received from contractors by the field organizations 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.
 - (b) Decisions on Order exemptions must be set forth in writing and must state the reasons for granting or denying the exemptions and, if granted, the basis for determining the exemptions do not present an undue risk to security, public health and safety, workers, or the environment.
- (2) Equivalency. Non-compliant transfers that are included in a DOE-approved Safety Basis per Title 10 Code of Federal Regulations (CFR) Part 830, Appendix A to Subpart B, "General Statement of Safety Basis Policy."
- (3) Equivalency. In accordance with the responsibilities and authorities assigned by Executive Order 12344, codified at 50 USC sections 2406 and 2511, and to ensure consistency throughout the joint Navy/DOE Naval Nuclear Propulsion Program, the Deputy Administrator for Naval Reactors (Director) will implement and oversee requirements and practices pertaining to this Order for activities under the Director's cognizance, as deemed appropriate.
- (4) Equivalency. Onsite transfers that use TSS resources that comply with the TSS safety basis.

4. REQUIREMENTS.

- a. Packaging and Transfer Procedures. Each site must maintain a set of packaging and transfer procedures, approved by the appropriate authority. The responsible Field Organization Managers must provide the oversight to ensure the

implementation of written procedures and compliance with the packaging and transfer authorization basis.

- (1) NNSA Type A(F) or Type B packages issued an Offsite Transportation Certificate (OTC) require packaging procedures to be approved by NNSA Service Center.
 - (2) Non-NNSA approved Type A(F) or Type B packaging procedures shall be approved by the appropriate authority.
 - (3) Transfer procedures must be approved by the contractor appropriate authority.
 - (4) Non-Type A or B packaging (e.g. IP-1, IP-II) procedures must be approved by the contractor appropriate authority.
- b. Transfer Authorization. Compliant transfers of materials of national security interest do not require additional authorization. Non-compliant transfers must be authorized through a DOE-issued Transportation Safety Document (TSD) safety evaluation report (SER).
- (1) Compliant Transfers of Radioactive Material. Compliant transfers of radioactive materials of national security interest do not require special authorization.
 - (a) Compliant packages must be used. Type A(F) or Type B quantities of material must be packaged in a DOE, NNSA, or NRC certified package in accordance with the Certificate of Compliance (CoC) or OTC.
 - (b) Transfer motor vehicles must follow DOT regulations.
 - (c) Personnel performing transfer operations must follow DOT regulations.
 - (2) Non-compliant Transfers of Radioactive Material. Non-compliant transfers for all materials of national security interest must be authorized by an approved safety basis.
 - (a) TSD. The TSD establishes the approved safety envelope for packaging and transfer operations for materials of national security interest. The TSD, when approved by a SER, satisfies the requirements of Attachment 3 of this Order and/or 10 CFR Part 830, Appendix A to Subpart B, Section F. The SER presents the results of the DOE review team and provides the framework for approval of the TSD giving the contractor authority to transfer these materials.

- (b) Non-compliant transfers that were evaluated as part of DOE-approved Safety Basis per 10 CFR Part 830, Appendix A to Subpart B, Section F “Documented Safety Analysis” do not require a TSD.
- c. Review and Approval Process. A DOE team reviews the TSD and makes recommendations to the responsible Field Organization Manager for approving the application/documentation for non-compliant transfers.
- d. Quality Assurance. Packaging and transfer activities for materials of national security interest must comply with DOE O 414.1C, *Quality Assurance*, dated 6-17-05. Each site must maintain a compliant Quality Assurance Program, approved by the appropriate Field Organization Manager, for the packaging and transfer of materials of national security interest. 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 that meets the requirements of 10 CFR Part 71 Subpart H.
- e. Transfer Operations.
 - (1) Each compliant transfer must be prepared and transported in accordance with the applicable hazardous materials regulations (49 CFR Parts 171-180, “Pipeline and Hazardous Materials Safety Administration, Department of Transportation”).
 - (2) All transfer activities performed under the TSS must be conducted according to 10 CFR Part 830, “Nuclear Safety Management.”
 - (3) Government or contractor vehicles (owned or leased) must be operated in compliance with the applicable Federal Motor Carrier Safety Regulations (FMCSRs) (49 CFR Parts 350-399).
 - (4) All non-compliant transfers (vehicles and packages) must be performed under the purview of an approved TSD.
 - (5) Transfer of nuclear explosives must meet the requirements of DOE O 452.1D, *Nuclear Explosive and Weapon Surety Program*, dated 4-14-09, and DOE O 452.2D, *Nuclear Explosive Safety*, dated 4-14-09.
- f. Scheduling Transportation Safeguards System (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. Refer to DOE O 461.1B, *Packaging and Transportation for Offsite Shipment of Materials of National Security Interest*, dated 12-16-10, for the requirements and 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.
 - (1) Training for compliant transfers must include the applicable hazardous materials training requirements of 49 CFR 172.704, "Training Requirements."
 - (2) In addition to paragraph 4.g.(1), motor vehicle drivers for compliant transfers must be trained and qualified according to the requirements of 49 CFR 391.11, "General Qualifications of Drivers."
 - (3) DOE must establish and maintain appropriate qualification standards for personnel with Headquarters and field oversight responsibilities per DOE O 226.1A, *Implementation of Department of Energy Oversight Policy*, dated 7-31-07.
 - (4) Auditable training records must be maintained.
- h. Documents/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 that implement this Order according to DOE O 226.1A, *Implementation of Department of Energy Oversight Policy*, dated 7-31-07.

5 RESPONSIBILITIES.

- a. Administrator, NNSA.
 - (1) Ensures implementation and execution of requirements and responsibilities in accordance with this Order.
 - (2) Grants or denies requests for exemptions to this Order.
- b. Principal Deputy Administrator. Recommends requests for Order exemptions to the Administrator.
- c. Chief, Defense Nuclear Safety. Advises the Principal Deputy Administrator on nuclear safety issues related to requests for exemptions to this Order.
- d. Deputy Administrator for Defense Programs.
 - (1) Assigns line management responsibilities.
 - (2) Provides overall management and policy direction for NNSA packaging activities and conduct of TSS operations.

- (3) Ensures oversight of contractor packaging and transfer operations, including the oversight performed by the DOE organizations in accordance to DOE O 226.1A, *Implementation of Department of Energy Oversight Policy*, dated 7-31-07.
 - (4) Reviews Field Organization Manager requests for exemptions to this Order and forwards with recommendation to the Principal Deputy Administrator for concurrence and to the Administrator, NNSA, for approval.
- e. Director, Office of Facility and Infrastructure Acquisition and Operations.
 - (1) Coordinates with appropriate DOE organizations in the development of standards and directives for onsite transfers.
 - (2) Coordinates with appropriate DOE organizations in the development of packages that may fulfill requirements for organizations outside of NNSA.
- f. Director, Office of Safety.
 - (1) Advises the Deputy Administrator for Defense Programs on nuclear safety requirements for packaging and transfer of materials of national security interest.
 - (2) For NNSA, performs packaging and transfer line management oversight that is focused primarily on the NNSA field elements and also assesses contractor activities, as needed, in order to evaluate the implementation and effectiveness of field element line management oversight. Oversight will focus on high-hazard packaging and transfer operations.
- g. Field Organization Managers.
 - (1) Approve SERs and TSDs.
 - (2) Ensures implementation of TSDs by site contractors.
 - (3) Ensure that NRC, DOE, and NNSA approved Type A(F) and Type B packages used for onsite transfers comply with certificates of compliance (CoCs) or Offsite Transportation Certificates (OTCs).
 - (4) Maintain current copies of all OTCs and CoCs and their respective Safety Analysis Reports for Packaging (SARPs) and SERs for packaging operations performed at their sites and/or by contractors they manage.

- (5) Implement oversight program of packaging and transfer operations according to DOE O 226.1A.
- (6) Ensure that the site has DOE personnel 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 initial transfer requests for Office of Secure Transportation (OST) assets in accordance with current TSR instructions issued by OST.
- (9) Submit to the Administrator, NNSA, through the Deputy Administrator for Defense Programs, requests for Order exemptions.

h. Assistant Deputy Administrator for Secure Transportation.

- (1) Defines frequency and content of site shipping requirement forecasts.
- (2) Authorizes the use of OST assets for onsite transfers.
- (3) Ensure that the TSS Documented Safety Analysis (DSA) includes applicable onsite transfers.

i. Director, NNSA Service Center.

- (1) Provides guidance to field organizations and contractors who prepare TSDs.
- (2) At the request of NNSA field organizations, provides subject matter experts to support the federally chaired transportation safety documentation team.
- (3) Approves and issues OTCs for packages used to transfer materials of national security interest.
- (4) Maintains copies of all currently approved NNSA SARPs, OTCs, SERs, and other supporting documentation.
- (5) Authorizes users of NNSA certified Type B packages, and revokes authorized user status when users fail to comply with OTC requirements.
- (6) Reviews and approves 10 CFR Part 71 Subpart H Quality Assurance Plans.

- (7) Trains and qualifies all NNSA Service Center personnel who perform package certification, onsite TSD reviews, and packaging and transfer oversight functions.
- (8) As requested, provides support to NNSA site offices conducting oversight of packaging and transfer operations.
- (9) Provides support to NNSA site offices in conducting the TSD review/comment process.
- (10) Provides support to NNSA Headquarters as lead, and/or participates in periodic oversight of packaging and transfer activities at NNSA user sites.

6 DEFINITIONS. See Attachment 2.

7 REFERENCES.

- a. Title XXXII of P.L. 106-65, National Nuclear Security Administration Act, as amended, which established a separately organized agency within the Department of Energy.
- b. DOE O 226.1A, *Implementation of Department of Energy Oversight Policy*, dated 7-31-07.
- c. DOE O 414.1C, *Quality Assurance*, dated 6-17-05.
- d. DOE O 452.1D, *Nuclear Explosive and Weapon Surety Program*, dated 4-14-09.
- e. DOE O 452.2D, *Nuclear Explosive Safety*, dated 4-14-09.
- f. DOE O 460.1C, *Packaging and Transportation Safety*, dated 5-14-10.
- g. DOE O 461.1B, *Packaging and Transportation for Offsite Shipment of Materials of National Security Interest*, 12-16-10. (NOTE: DOE O 461.1B and DOE O 461.2 complement each other. Therefore, DOE O 461.2 was not published on the Directives website until after the approval of DOE O 461.1B.)
- h. DOE O 470.4A, *Safeguards and Security Program*, dated 5-25-07.
- i. DOE M 470.4-6, Chg. 1, *Nuclear Material Control and Accountability*, dated 8-26-05.
- j. Title 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
- k. Title 10 CFR Part 830, "Nuclear Safety Management."
- l. Title 10 CFR Part 835, "Occupational Radiation Protection."

- m. Title 49 CFR Parts 171-180, "Pipeline and Hazardous Materials Safety Administration, Department of Transportation."
 - n. Title 49 CFR Parts 350-399, "Federal Motor Carrier Safety Regulations, Department of Transportation."
- 8 CONTACT. Questions concerning this Order should be addressed to the NNSA Facility Operations Division at 505-845-4325.

BY ORDER OF THE SECRETARY OF ENERGY:



DANIEL PONEMAN
Deputy Secretary

**CONTRACTOR REQUIREMENTS DOCUMENT
DOE O 461.2, ONSITE PACKAGING AND TRANSFER
OF MATERIALS OF NATIONAL SECURITY INTEREST**

This Contractor Requirements Document (CRD) establishes requirements for Department of Energy (DOE) site/facility management contractors, including National Nuclear Security Administration (NNSA) contractors. Contractors must comply with the requirements listed in the CRD to the extent set forth in their contracts. Definitions for key terms used in this CRD are provided in Attachment 2.

Regardless of the performer of the work, contractors are responsible for compliance with the requirements of this CRD. Contractors are 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. In doing so, the contractor must not unnecessarily or imprudently flow down requirements to subcontracts. That is, the contractor must: ensure that it and its subcontractors comply with the requirements of this CRD, and incur only costs that would be incurred by a prudent person in the conduct of a competitive business.

1. Contractors must maintain and implement a set of packaging and transfer procedures, approved by the appropriate authority, which ensuring the performance of onsite transfers in a manner compliant with the requirements of this CRD. The following constitute appropriate approval authorities for packaging and transfer procedures:
 - a. NNSA Type A(F) or Type B packages issued an Offsite Transportation Certificate (OTC) require packaging procedures to be approved by NNSA Service Center.
 - b. Non-NNSA approved Type A(F) or Type B packaging procedures shall be approved by the appropriate authority.
 - c. Transfer procedures must be approved by the contractor appropriate authority.
 - d. Non-Type A or B packages (e.g. IP-1, IP-II) procedures must be approved by the contractor appropriate authority.
2. Contractors who conduct non-compliant transfers of materials of national security interest must prepare and submit an onsite Transportation Safety Document (TSD) per Annex 1, Annex 2 and/or Documented Safety Analysis (DSA) to the Field Organization Manager for approval. With the exception of format or the exact content, the TSD must be prepared in accordance with Attachment 3.
3. Contractors must analyze packages to support onsite transfers.
4. Contractors who offer materials of national security interest for transfer where both the package and transporter are in accordance with applicable regulations as defined in Attachment 2 Definitions, 2. Compliant Transfers, will not require special authorization.

5. The contractor must not commence any non-compliant transfer operations until all TSD or DSA approvals have been granted, the contractor has complied with all requirements contained in the applicable authorization documents (TSDs), and approved packaging procedures are in place.
6. Contractors must maintain current copies of the TSDs, DSAs, OTCs, DOE and/or NRC CoCs, and associated Safety Evaluation Reports (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.
7. Contractors who package Type A(F) or Type B quantity of radioactive material in a certified Type A(F) or Type B package or a package authorized by a TSD, must develop packaging procedures that comply with the CoC, OTC, and/or TSD.
8. For compliant transfers, contractors must conduct Type A(F) or Type B packaging and transfer activities for materials of national security interest in compliance with a Title 10 Code of Federal Regulations (CFR) Part 71, Subpart H, Quality Assurance Plan. The Quality Assurance Plan must be submitted to the responsible Field Organization Manager for submittal to the NNSA Service Center for review and approval.
9. Contractors must conduct less than Type B packaging and transfer activities for materials of national security interest in accordance with a quality assurance program meeting the requirements of DOE O 414.1C, *Quality Assurance*, dated 6-17-05 or successor document.
10. For compliant transfers, a contractor that is a State agency not otherwise subject to DOT jurisdiction, and any other DOE contractor who operates a Government or contractor vehicle (owned or leased) onsite in performance of contract activities, must ensure that the operations are done in accordance with applicable Federal Motor Carrier Safety Regulations (FMCSR) (49 CFR Parts 350-399).
11. For compliant transfers, contractors must train and qualify all personnel who support and/or perform packaging and transfer operations for materials of national security interest to perform their assigned functions. The training must also include the applicable basic hazardous materials training requirements of 49 CFR 172.704, "Training Requirements" and motor vehicle drivers must be trained and qualified to the requirements of 49 CFR 391.11, "General Qualifications of Drivers."
12. Contractors must maintain auditable training records.
13. Contractors must ensure that their organizations develop, implement, perform, and document formal oversight programs according to DOE O 226.1A, *Implementation of Department of Energy Oversight Policy*, dated 7-31-07 or successor document.
14. Transfer of nuclear explosives must meet the requirements of DOE O 452.1D, *Nuclear Explosive and Weapon Surety Program*, dated 4-14-09, and DOE O 452.2D, *Nuclear Explosive Safety*, dated 4-14-09 or successor documents.

15. Contractors must submit Transportation Shipping Requirement forecasts if Transportation Safeguards System (TSS) resources are required for onsite transfers. Refer to DOE O 461.1B, *Packaging and Transportation for Offsite Shipment of Materials of National Security Interest*, dated 12-16-10, for the requirements and process to request and schedule TSS resources.
16. Contractors must comply with the safeguards and security requirements contained in the following order and manual for onsite transfers:
 - a. DOE O 470.4A, *Safeguards and Security Program*, dated 5-25-07.
 - b. DOE M 470.4-6, Chg. 1, *Nuclear Material Control and Accountability*, dated 8-26-05.
17. Contractors must submit an implementation plan detailing the actions required to comply with this CRD, the expected schedule for performance of those actions, an estimated time for achievement of compliance, and a cost estimate for implementing the plan. The plan must be submitted to the field organization manager within 6 months of inclusion of this CRD in the contract.

DEFINITIONS

1. Compliant Packages. Packages that meet the relevant Department of Transportation (DOT) regulations of 49 CFR Parts 171-180 and Nuclear Regulatory Commission (NRC) regulations of 10 CFR Part 71, NRC and DOE Certificates of Compliance (CoCs), and/or NNSA Offsite Transportation Certificates (OTCs) or CoCs.
2. Compliant Transfers. Onsite transfers for which both the package and transporter are in accordance with the relevant DOT regulations of 49 CFR Parts 171-180, 49 CFR Parts 350-399, NRC regulations of 10 CFR Part 71, NRC and DOE issued CoCs and/or NNSA OTCs or CoCs.
3. 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, including a description of the conditions, safe boundaries, and hazard controls that provide the basis for ensuring safety per 10 CFR Part 830 Appendix A to Subpart B.
4. Exemption. A waiver of the need to comply with specific requirements defined in this Order. An exemption to provisions of this Order may be granted only by the Administrator, NNSA.
5. Fissile Material. Material of plutonium²³⁹, plutonium²⁴¹, uranium²³³, uranium²³⁵, or any combination of these radionuclides. This term does not apply to material containing fissile nuclides, un-irradiated natural uranium and un-irradiated depleted uranium, or to natural uranium or depleted uranium that has been irradiated in thermal reactor only.
6. Hazardous Materials. Those materials that are defined as hazardous in 49 CFR Parts 171-180. Also known as “HAZMAT.”
7. Materials of National Security Interest. A class of strategic materials used in the development, testing, production and maintenance of nuclear weapons and other materials that have been designated as critical to our national security. This designation is primarily for fissionable nuclear material known as special nuclear material (SNM), but may include tritium. Items that contain these materials include nuclear explosives, nuclear components, special assemblies, classified assemblies, and miscellaneous SNM parts and compounds. The Deputy Administrator for Defense Programs may also designate other special materials or items to receive the control and physical protection afforded this class of material.
8. Miscellaneous SNM Parts and Compounds. Piece parts of a nuclear component, U.S. Navy nuclear fuel elements, other specialized reactor fuel elements, subcritical experiment assemblies, criticality experiment machine parts, other nuclear device parts, broken piece parts, radioisotope thermoelectric generators, radioactive sources, and bulk materials in metallic or various chemical compounds that contain plutonium or enriched uranium.

9. Motor Vehicle. Any machine, tractor, trailer, or semi-trailer propelled or drawn by mechanical power and used on the highways/roads in the transportation of property, or any combination thereof determined by the DOT Federal Motor Carrier Safety Administration.
10. Non-compliant Packages. Packages that do not meet the definition of “compliant packages” as defined herein.
11. Non-compliant Transfers. Onsite transfers that do not meet the definition of “compliant transfers” as defined herein.
12. Nuclear Component. Major subassembly of a nuclear explosive that contains SNM in quantities sufficient to fuel a nuclear explosion (e.g., pit or canned subassembly). Note that subassemblies containing tritium and no SNM are not nuclear components.
13. 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).
14. Offsite Transportation Certificate (OTC). An NNSA-prepared document, analogous to an NRC CoC, which describes the compliant package configuration, authorized contents, and transportation restrictions. An OTC authorizes packages for shipment of radioactive materials within the TSS and for commercial carriers. An OTC may declare essential positive measures, administrative controls, and a maximum number of specified packages per transporter. An OTC is issued only if the requirements of 10 CFR Part 71 have been met. It may be issued for either a one-time use or multiple uses up to 5 years, at which point it must be renewed.
15. Onsite. Any area within the boundaries of a DOE site or facility to which access is controlled.
16. Package. Packaging plus its contents.
17. Packaging. A receptacle and any other components or materials necessary for the receptacle to perform its containment function in conformance with minimum packing requirements.
18. Packaging (class 7). A assembly of components necessary to ensure compliance with packaging requirements of 49 CFR Part 173 Subpart I, *Class 7 (Radioactive) Materials*. This may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, and service equipment for filling, emptying, venting, and pressure relief, and devices for cooling or absorbing mechanical shocks. The conveyances, tie-down systems, and auxiliary equipment used in transport may sometimes be designated as part of the packaging.
19. Safety Analysis Report for Packaging (SARP). A document that conforms to NRC Regulatory Guide 7.9 and provides a comprehensive technical evaluation of a package.

The SARP consists of sections containing general information; structural, thermal, containment, shielding, and criticality evaluations; operating procedures; acceptance tests; and maintenance and quality assurance programs. The purpose of the SARP is to demonstrate conformity with the applicable sections of 10 CFR Part 71 and 49 CFR Parts 171-180.

20. Safety Basis. A documented safety analysis and hazard controls that provide reasonable assurance that a DOE nuclear facility may be operated safely in a manner that adequately protects workers, the public, and the environment.
21. Safety Evaluation Report (SER). A document that provides the results of the Transportation Safety Document review panel's safety evaluation of the DSA and/or TSD.
22. 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 [e.g., some NELAs, JTAs, or Laboratory Test Units (LTU)].
23. Special Nuclear Material (SNM). Plutonium, uranium-233, uranium enriched in the isotopes 235, and any other material which, pursuant to 42 U.S.C. 2071 (Section 51, as amended, of the Atomic Energy Act of 1954), has been determined to be special nuclear material; it also includes any material artificially enriched by any of the foregoing, not including source material.
24. Transfer. Onsite transportation activity, which includes the package and transporter, that occurs within a DOE site or facility.
25. Transportation Safeguards System (TSS). A DOE system managed and operated by the Office of Secure Transportation (OST). It is used for the safe and secure movement of materials of national security interest and other cargo deemed appropriate by responsible program elements and approved by the Deputy Administrator for Defense Programs. Such operations are authorized under the Atomic Energy Act and its amendments.
26. Transportation Safety Document (TSD). A DOE-approved site-specific documented safety basis manual of plans and procedures that provides guidance, control, and definitions for the performance of activities related to packaging and transfer of materials of national security interest.
27. Transportation Shipping Request. A document provided by the shipper to the Office of Secure Transportation (OST) and the receivers that includes the following information: shipment number, pickup and delivery points, delivery date, quantity and type of packages in shipment, security classification of shipment, the authorization basis, special handling requirements, hazardous material information, approved confirmations from both shipper and receiver, 24-hour emergency response telephone numbers, cargo tie-down restraint configurations, and name of the program office for which the shipment is being performed.

PACKAGING AND TRANSFER OF MATERIALS OF NATIONAL SECURITY INTEREST

1. **PURPOSE.** This attachment establishes requirements for operational safety controls for onsite transfer operations and provides Department of Energy (DOE) packaging and transportation safety requirements and policy objectives for development of an onsite Transportation Safety Document (TSD). DOE contractors must document this program in their TSDs and develop implementing procedures.
 - a. This attachment provides minimum safety requirements for the acceptance and use of onsite packages for the staging and onsite transfer of materials of national security interest. The design and development of suitable package configurations remains the responsibility of the DOE site or facility. Nuclear explosives must be transferred onsite utilizing the requirements for handling equipment identified in DOE O 452.2D, *Nuclear Explosive Safety*, dated 4-14-09, in addition to the requirements of this Order and attachment.
 - b. Onsite transportation safety documentation prepared in accordance with Annex 1 of this attachment defines the methodology for preparing a documented safety analysis as referenced in 10 CFR 830.204 and Part 830, Appendix A to Subpart B, Section F, "Documented Safety Analysis," for all onsite transfers within hazard category 1, 2, and 3 DOE nuclear facilities."
 - c. Compliant transfers of radioactive material and/or other hazardous materials may be conducted without special authorization and/or a documented TSD.
2. **SCOPE.** This attachment describes requirements that apply only to onsite packaging and transfer activities at DOE facilities that retain and transport materials of national security interest, pursuant to this Order.
3. **BACKGROUND.**
 - a. **Nuclear Explosives.** Nuclear explosive operations require additional special safety considerations because of the potential high consequence of an accident or unauthorized act. DOE O 452.2D provides a complete safety program for nuclear explosive operations. The Order requires that each DOE field organization have a comprehensive program for the safety of nuclear explosive operations that integrates nuclear explosive safety requirements with other safety requirements. DOE O 452.2D further specifies that the requirements for the safety of nuclear explosive operations may be implemented through the Integrated Safety Management approach.
 - b. **Materials of National Security Interest.** Special nuclear material, nuclear components, and special assemblies are staged and transferred onsite in approved package configurations via site-specific transporters specifically designed for onsite transfer. Special assemblies, such as nuclear explosive-like assemblies, are often transported on approved handling equipment.

4. OBJECTIVES. This attachment addresses safety requirements for onsite transfers of materials of national security interest. There are two major objectives: (1) to establish requirements for onsite packaging and transfer of materials of national security interest that ensure safe use of the Transportation Safeguards System (TSS), non-TSS government- and contractor-owned and/or leased resources, and consistent compliance with DOE directives; and (2) to establish a process of identifying and mitigating undue risks associated with non-compliant transfers.
5. RESPONSIBILITIES. The transfer approval authority for onsite packaging and transfer requirements is the responsibility of DOE field organization managers.
6. GENERAL SITE OBJECTIVES. Each site is required to document its compliance with this attachment by developing the onsite TSD in section 7 below. The following general objectives apply to the onsite packaging and transfer of materials of national security interest governed by this Order:
 - a. Promulgate the safety envelope using 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 for each site in accordance with the site-approved Quality Assurance Program.
7. TRANSPORTATION SAFETY DOCUMENT. The process of identifying and mitigating undue risk is the development of an onsite TSD, which establishes the approved safety envelope for packaging and transfer operations of materials of national security interest for non-compliant transfers. The safety envelope is defined by the hazards associated with the materials, appropriate analysis of credible accident scenarios, establishment of controls for prevention and mitigation, and implementation of a safety management strategy to ensure operations are performed within a formality of operations framework.
 - a. The TSD is the approved safety envelope for packaging and transfer operations for these materials at a site. This document, when approved, satisfies the requirements of this attachment and 10 CFR 830.204, Subpart B, "Documented Safety Analysis" and 10 CFR 830.205 "Technical Safety Requirements".
 - b. Contractors must use the requirements in Annexes 1 and 2 of this attachment in developing the TSD and the assessment methodology for the graded safety approach for each type of non-compliant packaging and transfer activity for materials of national security interest. Transfer of Type B quantities of radioactive and fissile materials transported in DOE and/or NNSA certified packages (e.g. CoC, OTC) do not require NNSA TSD transfer approval as referenced in this Order.

- c. Annex 1 of this attachment contains requirements that satisfy 10 CFR Part 830, Subpart B, and Annex 2 of this attachment contains requirements for onsite package and transfer configurations not subject to 10 CFR Part 830, Subpart B, requirements.
 - d. DOE recognizes that the onsite transfer requirements for materials of national security interest may differ from the modal transportation conditions established in the Federal regulations (for example, “Normal Conditions of Transport” in 10 CFR 71.71 and the “Hypothetical Accident Conditions” in 10 CFR 71.73). DOE sites may use a graded approach to onsite packaging and transfer for materials of national security interest. These materials may be grouped into a series of hazard categories per 10 CFR Part 830, “Nuclear Safety Management,” followed by selection of onsite packaging and transfer requirements appropriate for the particular hazard category.
 - e. A transfer configuration is a system or equipment approved for onsite transfer, which doesn’t resemble the general physical appearance typically attributed to a hazardous material package (e.g. nuclear explosives within or on a handling gear). Utilization of Office of Secure Transportation assets requires full operational compliance as identified in DOE O 461.1B.
 - f. The TSD documents the safety envelope for each transfer. The TSD must substantiate the conclusion that a credible accident must not cause individuals to receive a total effective dose (TED) greater than the levels referenced in DOE-STD-1189, *Integration of Safety into the Design Process*, public protection criteria per Appendix A, section A.2.1. Also, DOE sites must specifically analyze fissile material transfers, and the safety documentation must demonstrate that both the administrative and operating controls would prevent a criticality event in all credible onsite transfer accidents and staging incidents.
 - g. As referenced in this Order, the TSD must be submitted to the Field Organization Manager for approval, including all updates to the document that reflect any changes to transfer operations that could impact safety to the public, workers, and/or environment. An analysis between the existing approved TSD and the requirements in this attachment is required during the next annual update, to ensure the intent of this attachment is being met.
8. ONSITE PACKAGING AND TRANSFER PROCEDURES. Each facility or site must prepare onsite procedures for implementation of the TSD (per Annex 1 or 2 of this attachment) and/or compliant transfers. These procedures must include:
- a. packaging and transportation management,
 - b. technical safety requirements/operational safety requirement flow-down,
 - c. operating restrictions and system limitations,

- d. onsite packaging and transfer configuration restraint programs,
- e. transfer/transportation routes,
- f. onsite transfer vehicle management,
- g. package evaluation,
- h. occurrence reporting/abnormal events,
- i. administrative controls,
- j. training and qualification, and
- k. quality assurance requirements.

ANNEX 1
PREPARATION OF TRANSPORTATION SAFETY DOCUMENT
AND SAFETY ASSESSMENT METHODOLOGY FOR PACKAGING AND TRANSFER
ACTIVITIES SUBJECT TO 10 CFR PART 830 SUBPART B

1. INTRODUCTION. DOE O 461.2, *Onsite Packaging and Transfer of Materials of National Security Interest*, requires that each type of onsite transfer subject to Title 10 Code of Federal Regulations (CFR) Part 830, Subpart B, requirements is documented in an approved site-specific Transportation Safety Document (TSD). This TSD is expected to:
 - a. Identify responsibilities and lines of authority.
 - b. Identify and evaluate the hazards associated with the transfer.
 - c. Define minimum safe package requirements.
 - d. Describe transfer systems and operational controls used to minimize the probability and consequence of credible accidents.
 - e. Describe the process and analysis used to ensure establishment of safety requirements [NOTE: If U.S. Department of Transportation (DOT) requirements form the basis for the TSD, this analysis would be performed for each deviation from the hazardous materials regulations).
 - f. Describe the site, including identifying boundaries.
 - g. Describe emergency response and recovery actions for abnormal/off-normal events.
 - h. Define the process for non-routine packaging and transfer activities.

The TSD must be approved by the 10 CFR Part 830, Subpart B, Safety Basis Approval Authority (i.e., Field Organization Manager). Upon approval, all onsite transfers must be conducted in accordance with the approved TSD and accompanying DOE safety evaluation report.

2. PREFERRED FORMAT FOR TSD. The following is a preferred format for the TSD. However, in compliance with 10 CFR Part 830, Subpart B, the format is consistent with the Documented Safety Analysis/Technical Safety Requirements. The level of detail required depends on the complexity of operations, number and location of workers at the site, quantities and types of materials being transported, transport routes, and need for special controls (including security/safeguard controls) to meet DOE transportation safety requirements.
 - a. Chapter I, Scope and Applicability.
 - (1) Scope. State the onsite transfers of materials of national security interest that support the overall mission(s) of the site.

- (2) Applicability. Describe how the requirements of the document are applied to site and facility operations so that someone needing to transfer materials of national security interest can understand whether or not the requirements of the document apply to the movement in question.

b. Chapter II, Definitions and Acronyms.

Define all terms or acronyms used in the TSD relevant to onsite packaging and transfer operations. Define site-specific terms for the benefit of new employees or external reviewers of the document.

c. Chapter III, Site Description.

Provide enough information to enable a reader unfamiliar with the site to comprehend all site-specific discussion in the TSD.

d. Chapter IV, Organizational Responsibilities.

Clearly describe the authority and responsibilities of principal organizations and key positions within those organizations.

e. Chapter V, Requirements.

Reference the principal Federal, State, and local regulations, DOE Orders, and other requirements affecting onsite packaging and transfer, as well as site-specific requirements applicable to onsite packaging and transfer activities.

f. Chapter VI, Safety Assessment Methodology.

Describe the methodology used to achieve and demonstrate compliance with 10 CFR Part 830, Subpart B, including any probability or risk-based approaches used. Guidance on developing and applying a safety assessment methodology is provided in Section 3 of this annex.

g. Chapter VII, Routine Transfers.

Identify the major categories of hazardous materials or hazard classes routinely transferred onsite. Identify and evaluate the following requirements in this chapter:

- (1) Identify the hazards associated with the onsite nuclear material transfers.
- (2) Analyze the hazards associated with the onsite nuclear material transfers, including credible accident scenarios.
- (3) Identify available controls to mitigate and prevent any accident scenarios that represent an unacceptable risk.

- (4) Identify administrative controls that include containment, communication, and control strategies.
- (5) Identify safety management programs credited with reducing risk to include radiation protection, criticality safety, configuration management, change control, etc.

h. Chapter VIII, Non-routine Transfers.

Present the process for evaluating and submitting an approval request for an exception (e.g., unplanned, abnormal transfer, or minor categories of hazardous materials) to the routine transfer requirements of Chapter VII. Identify and evaluate the following requirements in the chapter:

- (1) Identify the hazards associated with the onsite nuclear material transfers.
- (2) Analyze the hazards associated with the onsite nuclear material transfers, including credible accident scenarios.
- (3) Identify available controls to mitigate and prevent any accident scenarios that represent an unacceptable risk.
- (4) Identify administrative controls that include containment, communication, and control strategies.
- (5) Identify safety management programs credited with reducing risk to include radiation protection, criticality safety, configuration management, change control, etc.

i. Chapter IX, Personnel Qualification and Training.

Identify and/or reference the training/qualification requirements for personnel involved with onsite packaging and transfer activities.

j. Chapter X, Documentation and Recordkeeping.

Records requirements must include retention of such items as package documentation [e.g., Safety Analysis Reports for Packaging (SARPs), test reports, or other package evaluations], personnel training and qualification records, change control documents, vehicle maintenance and inspection records, and documentation associated with both routine and non-routine transfers.

k. Chapter XI, Incident Reporting and Emergency Response.

Describe the incident reporting and emergency response programs/plans for the site. Present the lines of communication and the roles and responsibilities of key personnel involved in an emergency response or incident report specific to onsite

transfer. Planning should be adequate to cover all credible emergency situations to ensure effective response and recovery after a transport accident or incident.

l. Chapter XII, Transport Vehicle Operations.

Describe types of vehicles used for packaging and transfer operations per the TSD. Also, identify the maintenance and inspection process for these vehicles.

m. Chapter XIII, Technical Safety Requirements.

Technical Safety Requirements define the performance requirements of systems, structures and components (i.e., package and vehicles) and identify the safety management programs used by personnel to ensure safety. No safety limits or limiting control settings are expected for transportation activities because there are no processes or activities in which the operator intentionally causes a process variable to be manipulated that if left unchecked or uncontrolled, would result in catastrophic failure of a passive safety barrier. Thus, only limiting conditions of operations, design features, and administrative controls are envisioned for transportation activities.

3. SAFETY ASSESSMENT METHODOLOGY.

The following methodology must be used to support the safety basis for transfer systems:

a. Use of a Graded Approach.

- (1) The TSD must enable a site to establish containment, control, and communication requirements for onsite movements in a consistent and justifiable manner, and must ensure establishment of requirements commensurate with the hazard of the material being transported for an onsite movement.
- (2) The performance requirements imposed on each hazard level in the hazardous materials hierarchy must be documented in Chapter VII of the TSD. This documentation must enable a site to establish containment, control, and communication requirements for onsite movements in a consistent and justifiable manner, and must ensure that requirements established for an onsite movement will be commensurate with the hazard of the material being transported (i.e., nuclear component, special assembly, and/or radioactive materials).

b. Safety Assessment. The safety assessment method chosen should be clearly defined within the TSD. For higher hazard (e.g. hazard category II) transfers, it is recommended that a more quantitative analysis be applied (i.e., DOE-STD-3009). For lower hazard transfers the assessment may be considerably more qualitative.

This annex prescribes that a containment system be provided for all handling, staging, and transfer configurations for materials of national security interest. The

package used must be able to maintain containment of its contents under both normal use and credible onsite accident conditions. The safety assessment must document all credible onsite accident conditions for the various transfer and staging operations. Controls must be identified to mitigate any unacceptable risk to the public, workers, and the environment.

Reliance on package performance is the preferred way to ensure overall safety; however, an integrated approach that considers the package in combination with specific communication and control measures is also acceptable. As a first step, the analysis must be evaluated to determine the package requirements. Then the appropriate package must be identified and a basis provided for its selection as a control. Typically, if a compliant package (e.g. Type A, Type B) is chosen, the package already has specifications defined and performance attributes identified and no further analysis or support of the control is required. For a non-compliant package, a detailed analysis of the package in which the performance envelope of the package is clearly established is required.

The evaluation/safety assessment of the transfer system must be included in the TSD. This safety assessment may be straightforward or very complex, depending primarily on the packaging to be used for the hazardous materials movement.

The safety assessments for routine onsite hazardous materials movements may be documented in Chapter VII of the TSD or as standalone documents referenced in Chapter VIII. The process by which safety assessments for non-routine transfers are performed, documented, and approved must be described in Chapter VIII of the TSD. Documentation of the safety assessment may cover the following topics:

- (1) Identify the onsite hazardous material transfer that is to occur.
- (2) Identify and classify the hazardous materials involved in the transfer.
- (3) Identify normal and credible accident scenarios associated with the transfer.
- (4) Analyze the hazardous materials as a function of the credible accident scenario.
- (5) Identify available controls for prevention or mitigation, including the package and appropriate basis for the package performance envelope.
- (6) Select the appropriate controls and provide analysis, factoring in the control application.
- (7) Identify the administrative controls and safety management programs that contribute to reduction of the risk.

- c. Controls. Describe the controls required for the onsite transfers. These controls need only ensure that the packages must not be exposed to transport conditions more severe than the packages would experience during an offsite shipment.
- (1) Following DOT control and communication requirements for offsite transport is an option unless a non-compliant package is being used. No further evaluation is needed if activities will be done in accordance with DOT regulations. (Remember, the DOT tie-down and vehicle requirements would need to be imposed for a hazardous materials transfer to be done in accordance with DOT regulations).
 - (2) For non-compliant packages, controls must be commensurate with the hazard represented by the package being transported, and must ensure that the package operates within its established performance envelope. The hazard levels and associated performance requirements documented in chapter VII of the TSD greatly facilitate development and justification of appropriate transport controls. All credited controls that maintain the safety envelope must flow forward into the appropriate Technical Safety Requirement (i.e., limiting condition of operations, design features, or administrative controls).
- d. Communication. Describe the communication requirements for the onsite transfer. Again, following DOT communication and control requirements for offsite transport is an option for compliant packages. This option may be documented with no further evaluation. (Remember, fully following DOT/DOE requirements would include strict adherence to use of a compliant package, as well as following the applicable marking, labeling, placarding, and shipping papers requirements).
- The other option is to always develop site-specific communication requirements. Sites may develop other methods of communication with personnel involved with the transfer and with emergency response personnel. For non-compliant packages, communication requirements need to be established and evaluated as part of the entire transport system. As with the establishment of all transfer requirements, communication requirements must be commensurate with the hazard of the material being transported. Justification for communication requirements is provided based on the performance requirements documented in Chapter VII of the TSD. In some cases, special communication requirements may be described as part of the control requirements for the transfer. Such requirements must be repeated here.
- e. Conclusion. The safety assessment must conclude that, based on the evidence provided, the transfer system provides a level of protection commensurate with the hazard of the material being transferred.

ANNEX 2
PREPARATION OF TRANSPORTATION SAFETY DOCUMENT
AND SAFETY ASSESSMENT METHODOLOGY FOR PACKAGING AND TRANSFER
ACTIVITIES NOT SUBJECT TO 10 CFR PART 830 SUBPART B

1. INTRODUCTION. DOE O 461.2, *Onsite Packaging and Transfer of Materials of National Security Interest*, requires that each type of onsite transfer comply with the principles of integrated safety management and applicable DOE Orders and regulations (e.g., 10 CFR Part 835, “Occupational Radiation Protection”). This is documented in an approved site-specific TSD that is expected to:
 - a. Identify responsibilities and lines of authority.
 - b. Identify and evaluate the hazards associated with the transfer.
 - c. Define minimum safe package requirements.
 - d. Describe transfer systems and operational controls used to minimize the probability and consequence of credible accidents.
 - e. Describe the process and analysis used to ensure the establishment of safety requirements.
 - f. Describe the site, including identifying boundaries.
 - g. Describe emergency response and recovery actions for abnormal/off-normal events.
 - h. 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. Upon approval, all onsite transfers must be conducted in accordance with the approved TSD.

2. PREFERRED FORMAT FOR TSD. The following is a preferred format for the TSD. The level of detail required depends on the complexity of operations, number and location of workers at the site, quantities and types of materials being transported, number and complexity of site transport routes, and need for special controls (including safeguard controls) to meet DOE transportation safety requirements.
 - a. Chapter I, Scope and Applicability.
 - (1) Scope. State the onsite transfers of materials of national security interest that support the overall mission(s) of the site.
 - (2) Applicability. Describe how the requirements of the document are applied to site and facility operations so that someone needing to

transfer materials of national security interest can understand whether or not the requirements of the document apply to the movement in question.

b. Chapter II, Definitions and Acronyms.

Define all terms or acronyms used in the TSD relevant to onsite packaging and transfer operations. Define site-specific terms for the benefit of new employees or external reviewers of the document.

c. Chapter III, Site Description.

Provide enough information to enable a reader unfamiliar with the site to comprehend all site-specific discussion in the TSD.

d. Chapter IV, Organizational Responsibilities.

Clearly describe the authority and responsibilities of principal organizations and key positions within those organizations.

e. Chapter V, Requirements.

Reference the principal Federal, State and local regulations, and DOE Orders, including identification of site-specific requirements applicable to onsite packaging and transfer activities.

f. Chapter VI, Safety Assessment Methodology.

Describe the methodology used to achieve and demonstrate compliance with integrated safety management principles. Guidance on developing and applying a safety assessment methodology is provided in Section 3 of this annex. The primary emphasis of the onsite transfer system for these materials should be placed on package design and package performance to ensure containment of materials during routine and non-routine onsite transfer activities. Well-designed packaging can reduce both the probability and the consequences of a hazardous material release for a given package handling scenario.

g. Chapter VII, Routine Transfers.

Identify the major categories of hazardous materials or hazard classes routinely transferred onsite. Identify and evaluate the following requirements in this chapter:

- (1) Identify the hazards associated with the onsite material transfers.

- (2) Analyze the hazards associated with the onsite material transfers, including credible accident scenarios. This analysis may be more qualitative in nature than the analysis described in Annex 1.
- (3) Identify available controls to mitigate and prevent any accident scenarios with an unacceptable risk.
- (4) Identify administrative controls that include containment, communication, and control strategies.
- (5) Identify safety management programs credited with reducing risk to include radiation protection, configuration management, change control, etc.

h. Chapter VIII, Non-routine Transfers.

Present the process for evaluating and submitting an approval request for an exception (e.g., unplanned, abnormal transfer, or minor categories of hazardous materials) to the routine transfer requirements of Chapter VII. Identify and evaluate the following requirements in this chapter:

- (1) Identify the hazards associated with the onsite material transfers.
- (2) Analyze the hazards associated with the onsite material transfers, including credible accident scenarios.
- (3) Identify available controls to mitigate and prevent any accident scenarios with an unacceptable risk.
- (4) Identify administrative controls that include containment, communication, and control strategies.
- (5) Identify safety management programs credited with reducing risk to include radiation protection, configuration management, change control, etc.

i. Chapter IX, Personnel Qualification and Training.

Identify and/or reference the training/qualification requirements for personnel involved with onsite packaging and transfer activities.

j. Chapter X, Documentation and Recordkeeping.

Records requirements must include retention of such items as package documentation [e.g., Safety Analysis Reports for Packaging (SARPs), test reports, or other package evaluations], personnel training and qualification records, change control documents, vehicle maintenance and inspection

records, and documentation associated with both routine and non-routine transfers.

k. Chapter XI, Incident Reporting and Emergency Response.

Describe the incident reporting and emergency response programs/plans for the site. Present the lines of communication and the roles and responsibilities of key personnel involved in an emergency response or incident report specific to onsite transfer. Planning should be adequate to cover all credible emergency situations to ensure effective response and recovery after a transport accident or incident.

i. Chapter XII, Transport Vehicle Operations.

Describe types of vehicles used for packaging and transfer operations per the TSD. Also, identify the maintenance and inspection process for these vehicles.

j. Chapter XIII, Operational Safety Requirements.

Operational Safety Requirements define the performance requirements of systems, structures, and components (i.e., package, vehicles) and identify the safety management programs used by personnel to ensure safety. The nature of the consequences associated with these transfers is such that these activities may typically be appropriately controlled by administrative controls and safety management programs.

3. SAFETY ASSESSMENT METHODOLOGY.

The following methodology must be used to support the safety basis for less than hazard category 3 transfer systems activities:

- a. Use of a Graded Approach. The TSD must enable a site to establish containment, control, and communication requirements for onsite movements in a consistent and justifiable manner, and ensure establishment of requirements for an onsite movement commensurate with the hazard of the material being transported.
- b. Safety Assessment. The safety assessment method chosen should be clearly defined within the TSD. For higher hazard transfers, it is recommended that a more quantitative analysis be applied. For lower hazard transfers, the assessment may be considerably more qualitative.

This annex prescribes that a containment system be provided for all handling, staging, and transfer configurations for materials of national security interest. The packaging used must be able to maintain containment of its contents under both normal use and credible onsite accident conditions. The safety assessment must document all credible onsite accident conditions for the various transfer and staging operations. Controls must be identified to mitigate any unacceptable risk to the public, workers, and the environment.

Reliance on package performance is the preferred way to ensure overall safety; however, an integrated approach that considers the package in combination with specific communication and control measures is also acceptable. As a first step, the analysis must be evaluated to determine the package requirements. Then, the appropriate package must be identified and a basis provided for its selection as a control. Typically, if a compliant package (e.g., IP, Type A) is chosen, the package already has specifications defined and performance attributes identified and no further analysis or support of the control is needed. For non-compliant package, a detailed analysis of the package in which the performance envelope of the package is clearly established is required.

The evaluation/safety assessment of the transfer system must be included in the TSD. This safety assessment may be straightforward or very complex, depending primarily on the package to be used for the hazardous materials movement.

The safety assessments for routine onsite hazardous materials movements may be documented in Chapter VII of the TSD or as standalone documents referenced in Chapter VIII. The process for performance, documentation, and approval of safety assessments for non-routine transfers must be described in Chapter VIII of the TSD. Documentation of the safety assessment may cover the following topics:

- (1) Identify the onsite hazardous material transfer that is to occur.
 - (2) Identify and classify the hazardous materials involved in the transfer.
 - (3) Identify normal and credible accident scenarios associated with the transfer.
 - (4) Analyze the hazardous materials as a function of the credible accident scenario.
 - (5) Identify available controls for prevention or mitigation, including the package and appropriate basis for the package performance envelope.
 - (6) Select the appropriate controls and provide analysis, factoring in the control application.
 - (7) Identify the administrative controls and safety management programs that contribute to reduction of the risk.
- c. Controls. Describe the controls required for the onsite transfers. These controls need only ensure that the package must not be exposed to transport conditions more severe than the package would experience during an offsite shipment.
- (1) Following DOT control and communication requirements for offsite transport is an option unless a non-compliant packages is being used. No

further evaluation is needed if activities will be done in accordance with DOT regulations. (Remember, the DOT tiedown and vehicle requirements would need to be imposed for a hazardous materials transport to be done in accordance with DOT regulations).

- (2) For non-compliant packages, controls must be commensurate with the hazard represented by the package being transported, and ensure that the package operates within its established performance envelope. The hazard levels and associated performance requirements documented in chapter VII of the TSD greatly facilitate development and justification of appropriate transport controls.
- (3) All credited controls that maintain the safety envelope must flow forward into the appropriate documented controls.

- d. Communication. Describe the communication requirements for the onsite transfer. Again, following DOT communication and control requirements for offsite transport is an option for compliant packages. This option may be documented with no further evaluation. (Remember, fully following DOT/DOE requirements would include strict adherence to use of compliant packages as well as following the applicable marking, labeling, placarding, and shipping papers requirements).

The other option is always to develop site-specific communication requirements. Sites may develop other methods of communication with personnel involved with the transfer and with emergency response personnel. For non-compliant packages, communication requirements need to be established and evaluated as part of the entire transport system. As with the establishment of all transfer requirements, communication requirements must be commensurate with the hazard of the material being transported. Justification for communication requirements is provided based on the performance requirements documented in Chapter VII of the TSD. In some cases, special communication requirements may be described as part of the control requirements for the transfer. Such requirements must be repeated here.

- e. Conclusion. The safety assessment must conclude that, based on the evidence provided, the transfer system provides a level of protection commensurate with the hazard of the material being transferred.