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RADIOACTIVE MATERIAL TRANSPORTATION PRACTICES MANUAL

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U.S. DEPARTMENT OF ENERGY
Assistant Secretary for Environmental Management

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Office of Environmental Management

RADIOACTIVE MATERIAL TRANSPORTATION PRACTICES MANUAL

1. **PURPOSE:** This Manual establishes a set of standard transportation practices for U.S. Department of Energy (DOE) programs to use in planning and executing offsite shipments of radioactive materials including radioactive waste.
2. **SUMMARY:** This Manual is composed of 14 transportation practices that establish a standardized process and framework for interacting with State, tribal, and local authorities and transportation contractors and carriers regarding DOE radioactive material shipments. DOE programs are responsible for compliance with all applicable transportation regulations and agreements with State, tribal, or local authorities. The regulations provide a comprehensive basis for safely and securely shipping classified and unclassified radioactive materials.

The Senior Executive Transportation Forum was established by the Secretary of Energy in January 1998 to coordinate the efforts of Departmental elements involved in the transportation of radioactive materials and waste. In response to recommendations from various DOE programs and external stakeholders, the Forum agreed to evaluate the shipping practices being used or planned for use throughout the Department, document them, and, where appropriate, standardize them. The results of this effort are reflected in this Manual.

3. **REFERENCE:** Department of Transportation regulations in Title 49 of the Code of Federal Regulations (CFR); Nuclear Regulatory Commission regulations in Title 10 of the CFR; DOE O 460.1A, *Packaging and Transportation Safety*; DOE O 460.2, *Departmental Materials Transportation and Packaging Management*; and DOE O 470.1, *Safeguards and Security Program*.
4. **CONTACT:** Questions concerning this Manual should be addressed to the Office of Transportation, EM-24, 301-903-7284.



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TRANSPORTATION PRACTICES

1. INTRODUCTION

1.1 Purpose

This Manual establishes a set of standard transportation practices for U.S. Department of Energy (DOE) programs to use in planning and executing offsite shipments of radioactive materials including radioactive waste. The identified practices are for use by those organizations listed in ATTACHMENT 1. The practices are to be implemented by the responsible DOE office or by contractors or carriers acting on behalf of the Department (See ATTACHMENT 2 for the Contractors Requirements Document). These practices establish a standardized process and framework for interacting with State, tribal, and local authorities and transportation contractors and carriers regarding DOE radioactive material shipments. DOE programs are responsible for compliance with all applicable transportation regulations and agreements with State, tribal, or local authorities. The regulations provide a comprehensive basis for safely and securely shipping classified and unclassified radioactive materials.

The Senior Executive Transportation Forum was established by the Secretary of Energy in January 1998 to coordinate the efforts of Departmental elements involved in the transportation of radioactive materials and waste. In response to recommendations from various DOE programs and external stakeholders, the Forum agreed to evaluate the shipping practices being used or planned for use throughout the Department, document them, and, where appropriate, standardize them. The results of this effort are reflected in this Manual.

1.2 Background on DOE Shipments

DOE and its predecessor agencies have maintained a record of safe transportation of radioactive materials for more than 50 years. Of the thousands of shipments, none has resulted in an identifiable injury through release of radioactive material. Approximately 3 million packages of radioactive materials are shipped each year in the United States. Historically, DOE shipments constitute only a very small fraction (typically less than 1 percent) of the total radioactive material shipments; however, they comprise a significant portion (typically around 75 percent) of the curies (amount of radioactivity) shipped annually in the United States. In fulfilling its diverse civilian and defense missions, the Department must transport various types of radioactive materials. These include isotopes for medical, industrial, and research purposes; weapons-related materials; spent nuclear fuel and high-level waste; low-level waste (LLW) and mixed low-level waste (MLLW); transuranic (TRU) waste; and tritium-bearing reactor components.

DOE Headquarters program offices provide policy direction and oversight for packaging and transportation activities for their respective office. The DOE program offices responsible for shipments are the Offices of Environmental Management, Nuclear Energy Science and Technology, Science, Civilian Radioactive Waste Management; and within NNSA, Defense Programs, Defense Nuclear Nonproliferation, and Naval Reactors. DOE operations and field

offices are responsible for detailed planning and for ensuring full regulatory compliance for their shipments. The operations and field offices also serve as the primary points of contact for public and stakeholder interactions.

The Department uses packagings that comply with U.S. Department of Transportation (DOT) safety regulations for its non-defense transportation activities and packagings that meet DOE requirements for defense transportation activities. These packagings are designed to protect workers and limit the risk to the public during transportation. Packagings used for spent fuel and other highly radioactive material shipments are certified by the Nuclear Regulatory Commission (NRC) or by DOE using standards equivalent to NRC requirements.

Most DOE shipments are transported by commercial carriers; classified highway shipments are handled by DOE's Office of Transportation Safeguards. While some shipments are made by carriers under contract to DOE (or its contractors), most shipments are made by common carriers under terms of tenders that represent Departmentwide, regional, or local negotiated rates for shipping specific materials. Shipments are made by truck, rail, air, and, in limited cases, barge.

1.3 Regulations

DOT and NRC have the primary responsibility for Federal regulations governing radioactive material transportation. DOT regulations in Title 49 of the Code of Federal Regulations (CFR) set standards for packaging, transporting, and handling radioactive materials. DOT also specifies training required for personnel who handle and transport radioactive materials. NRC regulations in Title 10 of the CFR apply to the packaging and transportation by licensees of materials that have higher levels of radioactivity. DOE has modeled its standards on the NRC regulations. In some instances, DOE is subject to the NRC regulations. Transportation activities that are not regulated by DOT may be subject to the requirements of 10 CFR 835.

DOE O 460.1A, *Packaging and Transportation Safety*, establishes safety requirements for the proper packaging and transportation of DOE offsite shipments. DOE O 460.2, *Departmental Materials Transportation and Packaging Management*, establishes DOE requirements and responsibilities to supplement applicable laws, rules, regulations, and other DOE Orders for materials transportation and packaging operations.

DOE O 470.1, *Safeguards and Security Program*, establishes requirements and responsibilities to ensure appropriate levels of protection in addition to appropriate facility approval registration of common carriers in the Safeguards and Security Information Management System.

1.4 Shipments Covered by this Manual

The practices cover the majority of DOE radioactive material shipments but do not cover all materials and modes. Included are highway and rail shipments of spent nuclear fuel, high-level waste, tritium-bearing reactor components, LLW and MLLW, isotopes, and classified national security shipments. National security shipments include naval spent fuel rail shipments under the cognizance of the Naval Nuclear Propulsion Program and highway shipments of classified

materials made by DOE's Office of Transportation Safeguards. Truck shipments of TRU waste to the Waste Isolation Pilot Plant (WIPP) are also covered.

The practices do not apply to shipments by barge or water vessel since DOE ships only a very small number of unique items this way. Air shipments have not been included because the vast majority of DOE radioactive air shipments are of medical and research isotopes, which are handled by commercial air express services; these isotopes are very lightweight and must be delivered quickly because of their short half-lives. TRU waste shipments between DOE sites other than the WIPP are not covered here because the practices applicable to such shipments are still under consideration. Rail shipments to WIPP are currently being considered but are not yet planned, so the practices do not address such shipments. Other material shipments not specifically covered are those not currently planned or infrequently shipped. Such materials include depleted uranium hexafluoride cylinders, large-quantity sources, classified materials moving by commercial carriers, and fresh (new) nuclear fuel. The practices do not cover DOE shipments of non-hazardous materials, non-radioactive hazardous materials, or onsite transfers of radioactive material. All of these shipments, however, are subject to applicable regulations and DOE Orders.

1.5 Organization of this Manual

The practices described in this Manual have been divided, where appropriate, by mode (truck or rail) and by material type (classified versus non-classified, spent fuel, TRU waste, LLW, etc.). For some topics, such as emergency notification, a common approach can be applied to all modes and material types so such divisions were not necessary. In other cases, differing regulations or differing concerns based on the hazard of the material being shipped necessitated different requirements in the practices.

Practices are described for the following topics:

- Transportation Planning - the transportation planning activities that take place after the need for shipment has been identified;
- Emergency Planning - DOE emergency planning activities with State and tribal jurisdictions;
- Projected Shipment Planning Information - provision of information regarding projected shipments;
- Routing - practices to identify and select transportation routes;
- Security - actions taken to ensure the security of shipments;
- Carrier/Driver Requirements - practices to ensure that shipments use high-quality carriers and drivers;

- Shipment Prenotification - near-term notification activities for pending shipments;
- Transportation Operational Contingencies - operational contingencies that may interrupt normal transport operations;
- Tracking - DOE practices for tracking the location of shipments and facilitating communication with the drivers/crew of the vehicles;
- Inspections - inspections of shipments, including both verifications of vehicle roadworthiness and radiological condition of containers loaded on the vehicles;
- Safe Parking - the criteria to be used in selecting appropriate parking locations in the event that transportation operational contingencies occur;
- Emergency Notification - the process DOE uses to notify State and tribal officials, after DOE itself has received notification, of a transportation emergency;
- Emergency Response - DOE response to a transportation emergency;
- Recovery and Cleanup - post-emergency actions taken to recover and cleanup from an accident or incident.

These topics have been arranged as one would generally address them in planning and conducting shipments. Following the 14 topics are a glossary of terms (Attachment 3) and a list of acronyms (Attachment 4).

1.6 Updates

The practices in this Manual will be updated to cover programmatic changes, additional modes and materials as needed to support shipping programs. The practices also will be updated periodically to incorporate improvements and "lessons learned" from their application.

2. TRANSPORTATION PLANNING

2.1 Introduction

This section addresses the transportation planning activities that take place after the need for shipment of radioactive material has been identified. Transportation planning activities include characterization and classification of the material to be shipped, identification of applicable regulatory and programmatic requirements, selection and procurement of appropriate packagings, evaluation and selection of modes and carriers to be used, and planning for needed public information. The objective of transportation planning is to arrange for safe, secure, timely, and cost-effective movement of the radioactive materials. Opportunities for stakeholder

involvement in transportation planning activities are provided through outreach activities conducted by the DOE programs responsible for the materials to be transported.

DOE obtains input on transportation planning activities from a broad range of stakeholder organizations through the Transportation External Coordination Working Group (TEC/WG) and through interaction with States, tribes, local officials, carriers, regional groups, site advisory boards, and DOE's National Transportation Program outreach efforts.

2.2 Transportation Planning

2.2.1 Material Characterization and Classification

Characterization and classification of the material to be shipped are necessary to ensure that the material is shipped safely and in compliance with applicable regulations and that the material is compatible with the packaging selected for shipment. DOE is responsible for properly characterizing and classifying the material in accordance with DOT requirements and in sufficient detail to permit identification of appropriate packaging. Material characterization and classification are performed by DOE or contractor technical staff who possess detailed knowledge of the material and who have been properly trained on the DOT regulations pertaining to classification.

2.2.2 Identification of Regulatory and Programmatic Requirements

DOE identifies the need to ship, the materials to be shipped, the origin, the destination, the schedule on which shipments should be made, and other programmatic needs. DOE is responsible for identifying applicable regulatory requirements based on characterization of the material to be shipped.

2.2.3 Packaging Selection

Packaging selection depends on the DOT material classification and the chemical and physical characteristics of the material. The shipper is responsible for identifying the proper packaging and taking steps to ensure that the packagings are available when needed for shipment. For Type B packagings, the appropriate certificate of compliance must be checked to ensure that it is current and that the proposed contents have been approved. Packaging selection is performed by the shipper's or contractor's technical staff who have been properly trained on DOT and/or international packaging regulations.

2.2.4 Mode and Carrier Selection

Safety is the primary consideration in mode and carrier evaluation and selection. Shipments are typically planned using the mode of transportation and individual carriers within that mode that can safely provide the required service at the lowest overall cost to the Government. However, where for valid reasons a particular mode of transportation or a particular carrier within that mode must be used to meet specific program requirements and/or limitations, only that mode or

carrier will be considered. Examples of valid reasons for considering only one particular mode or carrier are where only a certain mode of transportation or individual carrier is able to provide the needed service or is able to meet the required delivery date, or where the shipping or receiving facilities preclude or are not conducive to service by all modes of transportation. In such instances, consideration will be limited to modes and carriers that can meet program requirements.

Some of the factors that should be considered in determining whether a carrier or mode of transportation can meet DOE's transportation service requirements for each individual shipment are—

- availability and suitability of carrier equipment for the weight and size of the cargo;
 - carrier terminal facilities at origin and destination;
 - pickup and delivery service, if required;
 - estimated time in transit; and
 - record of past performance of the carrier.
- a. Spent Nuclear Fuel and High-Level Waste. The DOT study "Identification of Factors for Selecting Modes and Routes for Shipping High-Level Radioactive Waste and Spent Nuclear Fuel" concluded the following:
- The transport casks used for spent fuel and high-level waste are designed to the most stringent packaging standards. The cask design reduces much of the risk associated with the transport of the material.
 - Radiation exposure risks associated with incident-free shipments and with potential accident conditions are very low.
 - A shipping campaign using larger-capacity rail/barge casks, where practicable, can reduce the number of trips needed and consequently may result in lower overall risk.
 - Shipment duration is the most significant safety factor.
 - As a general rule, highway offers the fastest movement among the three modes (highway, rail, and water), and waterway is the slowest.

DOE will consider these DOT study conclusions in its mode selection deliberations. Shippers will consult with appropriate State and tribal officials to ensure that the ultimate choice considers their concerns.

- b. Spent Nuclear Fuel Shipped Under the Nuclear Waste Policy Act, as Amended. For spent nuclear fuel shipped under the Nuclear Waste Policy Act, as Amended (NWPAA), special rail service (including dedicated trains) will be used if it enhances operations. All mode recommendations of the transportation services contractor must be approved by the DOE Office of Civilian Radioactive Waste Management.

2.2.5 Transportation Plans

- a. Non-Classified Spent Nuclear Fuel, High-Level Waste, Tritium-Bearing Reactor Components, and Transuranic Waste Shipments to WIPP. The cognizant DOE program office will consult with State, tribal, and carrier representatives when developing such plans and will provide them, for comment, to those states and tribes through whose jurisdictions the shipments are expected to be transported.

Transportation plans describe operational strategy and delineate steps that will be taken to ensure compliance with applicable regulatory and DOE requirements. Specific contents of transportation plans are determined by the program office and/or operations office, and in general include information on¹—

- organizational roles and responsibilities,
- material to be shipped,
- projected shipping window,
- estimated number of shipments,
- mode of transport and carriers to be used,
- packages to be used,
- preferred and/or alternative routes,
- shipment prenotifications,
- safe parking arrangements,
- tracking systems,
- emergency preparedness and response,
- recovery and cleanup,
- security arrangements, and
- public information.

¹ Security needs may require that some information be subject to restricted access.

- b. Low-Level Waste, Mixed Low-Level Waste, and Other Radioactive Material. Transportation plans are not routinely written for shipments of these materials. The cognizant program office will determine if the shipping activities warrant the development of a written transportation plan.

2.2.6 Communications Plans

Public information officers have standardized communications practices for providing general information to the public. General information on transportation of radioactive material is identified in Attachment 5. DOE program managers are encouraged to use this material whenever possible to address public concerns/questions. For some shipments, this general information may be sufficient.

- a. Non-Classified Spent Nuclear Fuel, High-Level Waste, Transuranic Waste Shipments to WIPP, and Tritium-Bearing Reactor Components. If the cognizant DOE program office determines that the standardized communications practices are not sufficient, they will develop a communications plan appropriate for the particular shipments in consultation with State, tribal, and carrier representatives. It will identify roles and responsibilities for exchanging accurate information between the Department, its shipper, carriers, affected states, tribes, and other Federal agencies, the media, and the public. The plan must identify points of contact and public spokespersons within DOE Headquarters program offices, participating DOE operations/area offices, and other participating Federal, State, and tribal agencies.

The designated DOE operations/area office will prepare campaign or shipment-specific public information materials, as necessary (i.e., fact sheets, briefing packages, news releases, and questions and answers) and coordinate those materials with the DOE Offices of Congressional and Intergovernmental Affairs and Public Affairs. When finalized, the materials will be shared with State and tribal agencies for their use and distribution. As requested, DOE will assist and support State and tribal agencies in responding to information requests from elected officials and the media.

For shipments conducted under the NWPAA, transportation contractors for the Office of Civilian Radioactive Waste Management will also prepare a communications and outreach plan describing how they will communicate and interact with State, tribal and local government officials, regional cooperative agreement groups, local civic organizations, the public, and the media. DOE will provide the proposed plan to appropriate parties along the transportation routes and seek their comments.

- b. Other Non-Classified Shipments Of Low-Level Waste, Mixed Low-Level Waste, And Other Radioactive Materials. In many instances, the general information described in Attachment 5 may be sufficient. For some unique campaigns, more detailed communications planning may be desired. The responsible program office will decide whether to develop a communications plan.

- c. Classified National Security Shipments. All inquiries regarding classified or national security shipments should be directed to the DOE Albuquerque Operations Office.

Requests for non-Classified briefings on the conduct of classified shipments, including naval spent fuel shipments, should be directed to the DOE Albuquerque Operations Office, which maintains a program to educate law enforcement and emergency response personnel about classified shipments.

3. EMERGENCY PLANNING

3.1 Introduction

This section addresses DOE emergency planning activities with State and tribal jurisdictions for the transportation of DOE radioactive material. It does not affect specific mutual aid agreements that DOE may have with State, tribal, local, or county organizations.

Emergency planning will include identification of hazards and threats, hazard mitigation, development and preparation of emergency plans and procedures, and identification of personnel, training, equipment, and other resources needed for an effective response. Planning covers activities that assist organizations to prepare for an incident/accident.

The DOE Transportation Emergency Preparedness Program (TEPP) provides "tools" to State and tribal authorities to assist them in preparing for response to a transportation incident involving DOE shipments of radioactive material. TEPP will focus its efforts with the states and tribes initially along identified DOE transportation corridors. The goal of TEPP is to establish consistent policies and implementing procedures, build public and institutional confidence, and demonstrate the ability to respond effectively. TEPP's focus is unclassified/non-weapons radioactive material shipments. DOE contact will be at the State and tribal levels; states will work with the local authorities as necessary to implement their programs.

3.2 Emergency Planning

- 3.2.1 Federal regulations set forth requirements for Federal, State, local, and tribal emergency planning activities. In addition, DOE Orders, guides, and manuals specify planning activities (including emergency planning) for the DOE shipper and other parties involved with shipping activities.

- 3.2.2 A TEPP Coordinator has been designated for each of the 8 Regional Coordinating Offices to serve as the interface with State and tribal organizations for emergency planning for DOE transportation of nonclassified radioactive material (see Figure 1). A current listing of TEPP coordinator names and phone numbers, along with additional information on TEPP is available at the Web site www.em.doe.gov/otem.

The Regional TEPP Coordinator will accomplish the following:

- Discuss emergency response roles, responsibilities, capabilities, notification

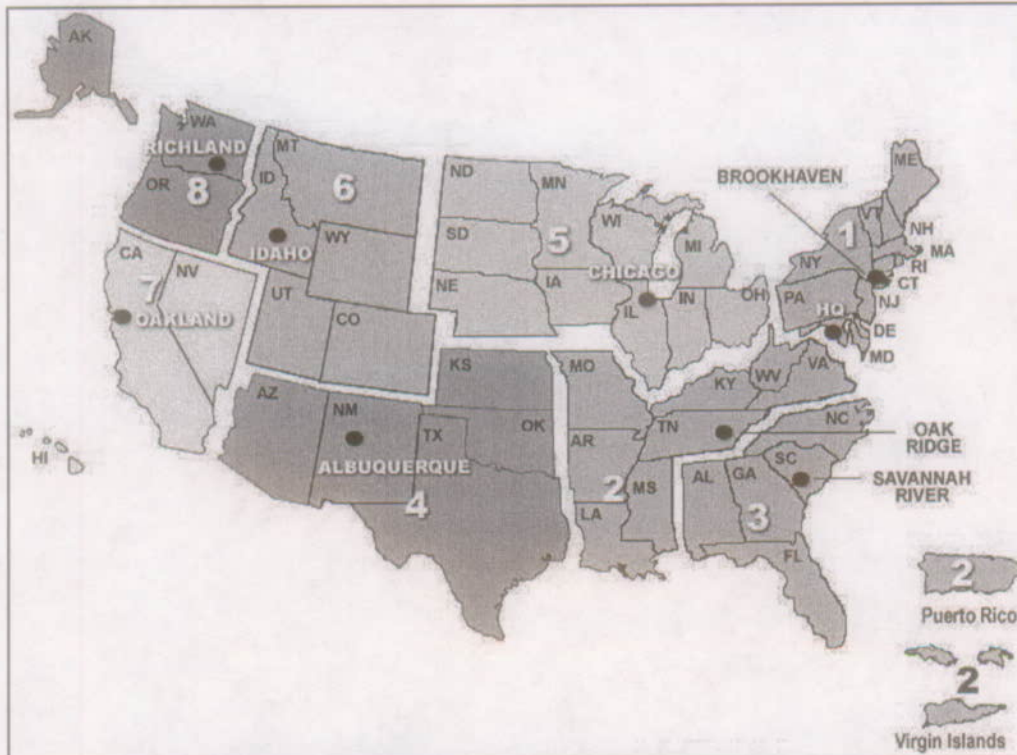


Figure 1. DOE Regional Coordinating Offices.

procedures, and information needs with State and tribal governments along transportation corridors used for DOE non-classified radioactive material shipments. DOE Regional TEPP Coordinators are available to provide planning information and assistance to State and tribal contacts within their region. (Also see the sections on Emergency Notification and Emergency Response.)

- Provide TEPP planning tools to State and tribal authorities to assist them in planning and preparing for response to transportation accidents/incidents involving DOE non-classified radioactive material and performing needs assessments.
- Coordinate with site transportation programs to identify planned non-classified radioactive material shipments to assist State and tribal organizations in planning for the various shipments. (See the sections on Transportation Planning and Projected Shipment Planning Information.)

- Coordinate information with TEPP coordinators in other regions affected by shipping routes that traverse more than one region.
- Coordinate with program offices, transportation managers, and public information officers during development of transportation plans and develop the emergency plans for shipping campaigns originating in their region. (See the section on Transportation Planning).

3.2.3 Program-specific planning activities include the following:

- a. The Office of Transportation Safeguards Emergency Management Plan documents the emergency planning process for any type of operational emergency involving Office of Transportation Safeguards personnel and vehicles.
- b. The Office of Civilian Radioactive Waste Management will require its carriers to develop an emergency response plan that addresses activities to be conducted in an accident or incident. Carriers are responsible for providing all drivers/crews and security personnel with specific written procedures that clearly define actions to be taken in the event of any emergency.

3.3 Training

3.3.1 Transportation Emergency Preparedness Program. Training modules have been developed to support a self-study or instructor-led format. The modules have been organized to provide information to responders relative to Class 7, radioactive material, at the awareness, operations, and technician levels of emergency response, as well as to the Incident Commander. The Modular Emergency Response Radiological Transportation Training (MERRTT) program has been developed to provide Federal, State, and tribal agencies with information and training materials for response to transportation incidents involving DOE radioactive material shipments. The training is separated into modules that can be integrated into existing programs for hazardous materials training. MERRTT was designed to provide materials for facilitated (instructor-led) and self-study training. Regional TEPP Coordinators will provide access to MERRTT training to State and tribal training points of contact within their region. Much of this training is applicable to Office of Transportation Safeguards and naval spent fuel shipments.

3.3.2 Program-specific training activities include the following:

- a. Office of Transportation Safeguards. Conducts drills and exercises regularly. In-service tests are conducted annually with DOE response elements and with State law enforcement and response agencies. The Office of Transportation Safeguards invites states to participate in its annual In-Service Training security and emergency response joint training exercises.

- b. WIPP. Provides training on WIPP transportation through the State and Tribal Education Program (STEP). STEP offers training in compliance with Public Law 102-579, the WIPP Land Withdrawal Act.
- c. Civilian Radioactive Waste Management Program. Funding and technical assistance will be provided to assist states and tribes to obtain training necessary to prepare for NWPAA shipments. This will include procedures for emergency response and safe routine transportation.
- d. The Naval Nuclear Propulsion Program. The Naval Nuclear Propulsion Program conducts periodic naval spent fuel shipment briefings and exercises. State, tribal, and local emergency services personnel participate or observe to familiarize themselves with naval spent fuel shipments, the escorts who accompany the shipments, and the coordination required for response to an emergency.

4. PROJECTED SHIPMENT PLANNING INFORMATION

4.1 Introduction

This section addresses the provision of information regarding projected shipments of DOE radioactive materials. The information to be provided and the timing of it will be determined by the responsible DOE office. This will permit each program to determine, in concert with their stakeholders, the appropriate schedule for providing information.

4.2 Planning Information

Planning information is the general information regarding projected shipments that is shared with State and tribal authorities to allow them to adequately plan resources for inspections, emergency response, accident prevention, and public information/outreach activities. DOE programs and shippers will establish an ongoing dialogue, consistent with security considerations, with State and tribal agencies that demonstrate an ongoing interest in shipments traveling through their jurisdictions.

4.2.1 Non-Classified Shipments

- a. General information will be provided for shipment of the following materials:
 - spent nuclear fuel;
 - high-level waste;
 - high-volume shipments of LLW and MLLW;²

² For the purposes of this protocol, high-volume truckload shipments are those that a shipper schedules for an average of five or more truckload shipments per week between a given origin and destination for a period of 3 or more months; high-volume rail shipments are those that a shipper schedules for an average of 60 railcars or more per month between a given origin and destination for a period of 3 or more months.

- TRU waste;
 - tritium-bearing reactor components.
- b. General information may include the following³ (the responsible DOE office, in consultation with State and tribal authorities, will determine the specific information to be made available):
- when shipments are anticipated;
 - origin;
 - destination;
 - projected pass-through states and tribal lands;
 - expected number of shipments;
 - operational specifics (e.g., whether shipments are escorted);
 - description of material to be shipped;
 - packaging descriptions;
 - shipping modes;
 - potential routes;
 - DOE/contractor point of contact;
 - list of applicable reference documents (e.g., environmental impact statement, environmental assessment, record of decision).
- c. Recipients of the information include the following:
- State and tribal agency officials/points of contact (Note: States may pass on information to local governments as they deem appropriate) and
 - other parties as deemed appropriate by the responsible DOE office, in consultation with State and tribal authorities (e.g., regional groups).
- d. Frequency of updates. In consultation with State and tribal authorities, the responsible DOE office will determine the frequency of updates based on changes in the shipment planning parameters.
- e. Method of providing information.
- (1) In consultation with State and tribal authorities, the responsible DOE office will determine the most appropriate method for providing and updating the information.
 - (2) DOE programs may use the Prospective Shipments Module for spent fuel, highway route-controlled quantity, and other campaigns, after the NEPA process is completed.

³ Security needs may require that some information be subject to restricted access.

4.2.2 Classified National Security Shipments

- a. General information, as described above, on both highway shipments of classified materials made by the Office of Transportation Safeguards and on naval spent fuel shipments, is discussed with State and tribal officials.
- b. DOE works with contacts, designated by states and tribes, with needs for information about classified national security shipments.

5. ROUTING

5.1 Introduction

This section addresses the identification and selection of highway and rail transportation routes for shipments of DOE radioactive materials, but does not change current agreements between DOE and states and tribes regarding the routing of DOE shipments.

5.2 Highway Routing

5.2.1 Non-Classified Shipments

a. Spent Nuclear Fuel, High-Level Waste, and Tritium-Bearing Reactor Components

- (1) Highway routes are selected in accordance with 49 CFR 397.101(b) for these highway route-controlled quantity shipments.
- (2) DOE/transportation contractors analyze proposed routes using transportation models (such as HIGHWAY).
- (3) States and tribes may designate routes in accordance with DOT regulations (49 CFR 397.103). Additional input resulting from stakeholder review of projected shipment planning information is considered. Routes are documented in specific shipment transportation plans.
- (4) For safeguards and security purposes, the following practices apply:
 - (a) For spent nuclear fuel shipments involving NRC-licensed material or licensees (i.e., shipments of spent nuclear fuel under the NWPAA, Foreign Research Reactor spent nuclear fuel shipments, and university and research reactor spent nuclear fuel shipments), the shipper or transportation contractor submits routes for NRC approval in accordance with 10 CFR 73.37.
 - (b) The following shipments are not subject to NRC safeguards and security review:

- shipments of tritium-bearing reactor components;
 - high-level waste shipments;
 - shipments of domestic DOE-owned spent nuclear fuel [conducted in compliance with DOE Orders, whose requirements were approved by DOT under 49 CFR 173.22(c)(2) as essentially equivalent to NRC's].
- (5) For spent fuel and high-level waste shipments made under the NWPAA, the responsible program will also follow the route selection requirements in the operational protocols identified in "Acquisition of Waste Acceptance and Transportation Services for the Office of Civilian Radioactive Waste Management" (Draft RFP #DE-RP01-98RW00320 or subsequent revisions), including DOE responsibility for stakeholder interactions and final route approval.

b. Transuranic Waste Shipments

- (1) Shipments to the Waste Isolation Pilot Plant. DOE negotiates routes with States and tribes on behalf of the carrier. Specific routes to WIPP will be identified from each waste generator site. In developing these routes, DOE—
- suggests routes to states and tribes, based on highway route-controlled quantity routing criteria (49 CFR 397.101), which carriers would follow between given origins and destinations;
 - provides for State, tribe, and local review and comment on proposed routes;
 - recognizes that states and tribes may designate routes in accordance with DOT regulations (49 CFR 397.103);
 - uses cooperative agreement groups to help facilitate interactions with states;
 - allows for route modifications following a defined process involving states, tribes, and local stakeholder input;
 - minimizes the number of routes used for WIPP shipments;
 - specifies routes to be used as an enforceable provision in contracts with carriers.
- (2) Other TRU Shipments. DOE is examining the requirements to be used for these shipments.

- c. Low-Level and Mixed Low-Level Waste. Carriers will select routes in accordance with 49 CFR 397.101(a). [The provisions of 49 CFR 397.101 state, except in circumstances

when there is only one practicable highway route available, considering operating necessity and safety, the carrier must—

- (1) ensure that the motor vehicle is operated on routes that minimize radiological risk;
- (2) consider available information on accident rates, transit time, population density and activities, and the time of day and the day of week during which transportation will occur to determine the level of radiological risk; and
- (3) tell the driver which route to take and that the motor vehicle contains Class 7 (radioactive) materials.]

d. Isotopes. Carriers will comply with 49 CFR 397.101.

5.2.2 Classified National Security Shipments

The provisions of 49 CFR 173.7(b) exempt classified shipments from DOT regulations. However, DOE uses approved hazardous material cargo routes, as designated by states or tribes, as a guide for classified national security shipments. DOE optimizes the use of four-lane highways and two-lane roads with wide shoulders for safety and security concerns.

5.3 Rail Routing

5.3.1 Non-Classified Shipments

a. Spent Nuclear Fuel and High-Level Waste

- (1) DOE or its designated shipper specifies carriers and interchange points between carriers. DOE will coordinate routing options with rail carriers and stakeholders.

The following factors should be considered to the extent practicable:

- distance traveled;
 - number of interchanges between railroads;
 - use of higher-class track, for example, “key routes” as defined in Association of American Railroads Circular OT-55;
 - operational input from carriers.
- (2) DOE/transportation contractors analyze proposed routes using transportation models (such as INTERLINE).
 - (3) DOE consults with states and tribes on the transportation plans. Additional stakeholder input resulting from stakeholder review of projected shipment

planning information is considered. Routes are documented in specific shipment transportation plans.

- (4) For safeguards and security purposes, the following practices apply:
- (a) Routes for spent nuclear fuel shipments involving NRC-licensed material or licensees (that is, shipments of spent nuclear fuel under the NWPAA, Foreign Research Reactor spent nuclear fuel shipments, and university and research reactor spent nuclear fuel shipments) are submitted by the shipper or transportation contractor for NRC review in accordance with 10 CFR 73.37.
 - (b) The following shipments are not subject to NRC safeguards and security review:
 - shipments of tritium-bearing reactor components;
 - high-level waste shipments;
 - shipments of domestic DOE-owned spent nuclear fuel [conducted in compliance with DOE Orders, whose requirements were approved by DOT under 49 CFR 173.22(c)(2) as essentially equivalent to NRC's].
- (5) For spent nuclear fuel and high-level waste shipments made under the NWPAA, the responsible program will also follow the route selection requirements in the operational protocols identified in "Acquisition of Waste Acceptance and Transportation Services for the Office of Civilian Radioactive Waste Management" (Draft RFP #DE-RP01-98RW00320 or subsequent revisions), including DOE responsibility for stakeholder relations and final route approval.

b. Transuranic Waste Shipments

- (1) Shipments to the Waste Isolation Pilot Plant. No rail shipments to WIPP are currently planned. The protocol for rail shipments to WIPP will be developed if a decision is made to utilize rail.
- (2) Other TRU Shipments. DOE is examining the requirements to be used for these shipments.

c. Low-Level and Mixed Low-Level Waste. DOE or its designated shipper specifies carriers and interchange points between carriers. Each carrier selects the specific route to be used while the shipment is in the carrier's custody and care.

5.3.2 Classified National Security Shipments

National security rail shipments are routed as described above for spent nuclear fuel and high-level waste (Section 5.3.1.a.(1)). Routing information is made available to State and tribal

organizations for discussion as described in the Projected Shipment Planning Information section.

6. SECURITY

6.1 Introduction

This section addresses actions taken to ensure the security of DOE shipments of radioactive material(s).

Security of the material will be provided through compliance with NRC regulations in 10 CFR 73, equivalent DOE requirements, or DOT requirements/industry practices, depending on the ownership, type, and quantity of radioactive material, and whether the transport activity falls under NRC license. Early in the shipment planning process, the responsible DOE program will identify the Federal security regulations and requirements applicable to the shipment. State and tribal officials can then plan accordingly in consultation with the responsible DOE program. Appropriate memorandums of understanding or memorandums of agreement will be identified and followed in planning the security of radioactive shipments.

Information dealing with the security of radioactive shipments in transit can be sensitive. Depending on the type and quantity of material being shipped, this information may need to be protected as Safeguards Information under NRC regulations or as Unclassified Controlled Nuclear Information under DOE requirements.

Assessments of possible security threats against shipments (e.g., civil unrest directed toward a shipment, malevolent action against a shipment, activity to interfere with the progress of a shipment, etc.) are performed by DOE and external organizations (e.g., NRC, FBI, State law enforcement agencies), as applicable. These threat assessments are used to assist in determining appropriate security measures for shipments.

6.2 Security

6.2.1 Non-Classified Shipments

a. Spent Nuclear Fuel and High-Level Waste

- (1) Security will be provided in compliance with NRC requirements in 10 CFR 73 for shipments subject to NRC regulation or, for those shipments not subject to NRC regulation, equivalent DOE requirements. NRC regulations and DOE requirements prohibit unauthorized disclosure of safeguards and security information.
- (2) For shipments subject to NRC regulations, armed escorts are provided in heavily populated areas in accordance with 10 CFR 73.37. During transit, these

shipments are under constant surveillance by the drivers or escorts. Other shipments will be escorted as needed to meet equivalent requirements.

- (3) Liaison with State and tribal law enforcement officials will be provided by DOE.
- (4) Escorts may be provided by State, tribal, or local jurisdictions, at their discretion.
- (5) Transportation Tracking and Communications System (TRANSCOM) will be used to track shipments, as described in the Tracking Protocol.
- (6) In addition to the above, the following practices apply to Foreign Research Reactor Fuel shipments:
 - (a) Upon arrival in coastal waters, security zones are established around the ship by the U.S. Coast Guard in accordance with a memorandum of agreement.
 - (b) Overland transport security is coordinated with State and tribal law enforcement officials and the involved railroad and motor carriers.

b. Low-Level Waste, Mixed Low-Level Waste, Isotopes

The carrier is responsible for care and custody of material in its possession.

c. Transuranic Waste Shipments

(1) Shipments to the Waste Isolation Pilot Plant

- (a) Escorts may be provided by State, tribal, or local jurisdictions, at their discretion.
- (b) Shipments to WIPP will be tracked through TRANSCOM as described in the Tracking Protocol.
- (c) During transit, shipments are required to be under constant surveillance by the drivers.
- (d) Liaison with State and tribal law enforcement agencies will be maintained regarding security concerns as may be identified.

(2) Other TRU Shipments

Procedures for TRU shipments to sites other than WIPP are being considered.

d. Tritium-Bearing Reactor Components

- (1) Escorts may be provided by State, tribal, or local jurisdictions, at their discretion.
- (2) Shipments will be tracked by TRANSCOM as described in the Tracking Protocol.
- (3) Specific security measures will depend on the outcome of threat assessments.
- (4) The carrier is responsible for security during shipment.

6.2.2 Classified National Security Shipments

a. Office of Transportation Safeguards Shipments

- (1) Armed Federal agents accompany each Office of Transportation Safeguards shipment. These agents are trained to protect and defend shipments from any attack or following any accident.
- (2) The trailers used to transport nuclear weapons are specially designed vehicles that incorporate safeguards to prevent unauthorized removal of the cargo.
- (3) The Office of Transportation Safeguards Secure Communications Center (SECOM) monitors, tracks, and provides communication with every convoy on the road as described under Tracking.
- (4) State law enforcement officials are briefed through the Office of Transportation Safeguards' state liaison program.

b. Naval Spent Fuel Shipments

- (1) Shipments are escorted full-time by armed, specially trained (communications, firearms, tactics, observation, use of deadly force) active duty Navy personnel who maintain 24-hour surveillance.
- (2) Close liaison is maintained with rail carrier police departments who coordinate with State and local law enforcement officials as necessary. Rail carrier police departments are provided advance information for each shipment.
- (3) Office of Transportation Safeguards SECOM monitors, tracks, and provides communication with every shipment as described in the Tracking section.
- (4) State law enforcement officials are briefed through the Office of Transportation Safeguards' state liaison program.

7. CARRIER/DRIVER REQUIREMENTS

7.1 Introduction

This section addresses steps taken to ensure that high-quality carriers and drivers are utilized and meet Federal safety standards for transportation of radioactive materials (e.g., vehicle

maintenance, record-keeping, training, certifications, licensing, and controlled substances and alcohol testing).

7.2 Highway Carrier/Driver Requirements

7.2.1 Non-Classified Shipments

DOT provides oversight of carriers. All carriers who transport truckload quantities of radioactive material or hazardous waste, or who transport any quantity of Highway Route Controlled Quantities of radioactive materials, must be evaluated for safety, financial status, security, and compliance with applicable regulations.

DOE must ensure that drivers hold a current commercial drivers license (CDL) with a hazardous material endorsement. They must meet applicable requirements in 49 CFR, including a DOT-managed random drug and alcohol-testing program. Additional requirements are described below by the type of radioactive material shipped.

- a. Spent Nuclear Fuel, High-Level Waste, and Tritium-Bearing Reactor Components. The provisions of 49 CFR govern carrier and driver requirements for shipments of spent nuclear fuel and high-level waste. For Highway Route Controlled Quantities of Radioactive Material, these driver training requirements are codified in 49 CFR part 397. In addition to the CFR-required training, truck drivers are required to be knowledgeable in the Commercial Vehicle Safety Alliance Enhanced (CVSA) (Level VI) North American Standard Inspection Procedures; in particular, Part I - Driver Inspection Standards.

Spent Nuclear Fuel Shipped Under the Nuclear Waste Policy Act, as Amended (NWPAA). In addition to the minimum qualifications, driver/crew training must cover operation of the specific package tie-down systems, cask recovery procedures, use of radiation detection instruments, use of TRANSCOM and other communications equipment, adverse weather and safe parking procedures, public affairs awareness training; first responder awareness training (29 CFR Part 1910.120 [q]), and radiation worker "B" (or equivalent) training.

- b. Transuranic Waste Shipments

- (1) Shipments to the Waste Isolation Pilot Plant

The WIPP transportation plan includes specific requirements for driver qualifications, driver performance requirements, driver training, carrier requirements, inspection requirements, and vehicle maintenance requirements.

- (2) Other TRU Shipments

DOE is examining the requirements to be used for these shipments.

- c. Low-Level and Mixed Low-Level Waste. LLW and MLLW shipments are made in accordance with applicable 49 CFR regulations based on the type and level of hazard associated with the material.
- d. Isotopes. Isotope shipments are made in accordance with applicable regulations.

7.2.2 Classified National Security Shipments

Drivers must be at least 21 years of age and hold a current CDL with hazardous material endorsement. They must meet applicable requirements in 49 CFR and are also required to pass an annual recertification with a check ride. They receive extensive driver training (3-week tractor/trailer driving class, off-road driving course, defensive driving courses) and comply with DOT safety regulations. Drivers are covered by the Personnel Assurance Program (PAP). This program requires that training, security, and medical requirements are completed and verified annually by the PAP administrator and certified by the Manager of the Office of Transportation Safeguards. Also, drivers must pass a comprehensive annual physical examination and are subject to random drug and alcohol testing. For classified shipments, DOE has its own fleet vehicle program. All vehicles are required to go through a complete maintenance inspection prior to departing.

7.3 Rail Carrier Requirements

Rail carriers must comply with Federal Railroad Administration (FRA) regulations. Rail carriers are responsible for training and qualification of their crews including application of 49 CFR Part 240, Qualification and Certification of Locomotive Engineers, to operate over the district in which the train will move.

The FRA requires recurrent and function-specific training for personnel performing specific work, such as train crews, dispatchers, and signal maintainers. FRA regulations mandate recurrent training at a minimum interval of 3 years, but in cases of changed or redefined job functions or newer employees, training occurs at more frequent intervals. FRA regulations require drug and alcohol testing of engineers and crew. Regulations also require that all employees receive specific training directly tailored to job function. These regulations are meant to serve as a baseline set of requirements for the industry, and carriers often institute measures that exceed those requirements.

Regulatory compliance on the part of rail carriers in the area of rail safety (including crew training and preparedness and equipment inspection) is assured by rail industry rules, standards, and recommended practices which correspond with and in some cases enhance said regulations. Additionally, safety and performance provisions are standard features of DOE contract carrier agreements, and provide another measure of assurance that regulatory requirements are met.

For NWPAA spent fuel shipments, rail carriers are also responsible for maintaining a training program addressing a list of areas, such as operation of the specific package tie-down systems, public affairs, first responder awareness training, and use of TRANSCOM. Crews will also be trained for hazardous material handling in accordance with individual railroad operating rules.

8. SHIPMENT PRENOTIFICATION

8.1 Introduction

This section addresses near-term notification activities for pending DOE shipments of radioactive materials.

8.2 Shipment Prenotification

Shipment prenotification informs public officials that specific near-term shipments will be transported through their jurisdictions. Such prenotifications will be done as required by regulations and agreements with states and tribes.

8.2.1 Non-Classified Shipments

- a. Spent Nuclear Fuel and High-Level Waste. DOE, its contractors, or its carriers will provide advance notification of non-classified shipments of spent fuel and high-level waste in accordance with applicable requirements as shown in Table 1. In addition to the required formal prenotification, the Department intends that verbal or written notification be provided to State and tribal designated points of contact so that they are informed at least 7 working days prior to actual shipment.
- b. Transuranic Waste Shipments to WIPP. The following notifications will be made to corridor states and tribes affected by TRU waste shipments to WIPP:
 - (1) Annual projection of shipments by January 31.
 - (2) Six-month update of the annual projection by July 31.
 - (3) A 14-day notification made prior to the first five WIPP shipments for each corridor. These will be provided to affected corridor states and tribes by a single letter for all five shipments. The following information will be included in 14-day notifications for shipments to WIPP:
 - (a) name, address, and telephone number of the shipper, carrier, and receiver;
 - (b) point of origin of the shipment;
 - (c) description of the shipment;
 - (d) estimated date and time of departure from the point of origin.

- (4) Eight-week rolling projections are—
 - (a) provided by TRANSCOM, or other electronic means and
 - (b) updated when schedule changes.
 - (5) 2 hours prior to entry into each state and tribal jurisdiction, notifications are—
 - (a) provided by telephone from the WIPP Central Monitoring Room and
 - (b) to designated state control center.
- c. Other DOE Shipments. No shipment-specific notifications (other than those required to comply with applicable international, Federal, state, local, and tribal laws, rules, and regulations) will be provided for shipments of—
- (1) LLW and MLLW,
 - (2) isotopes, and
 - (3) tritium-bearing reactor components.
- d. Additional Shipment Information Practices. DOE offices may provide additional planning information and shipment prenotification to State, tribal, and local authorities.

Table 1. Notification Requirements for Non-Classified Spent Nuclear Fuel and High-Level Waste.

Requirements	Type of Shipment		
	Non-Classified DOE SNF and HLW not subject to NRC regulation	SNF subject to NRC regulation, in excess of 100 g net weight and over 100 rems per hour at 3 feet	SNF subject to NRC regulation, less than 100 g net weight or under 100 rems per hour at 3 feet and HLW subject to NRC regulation
Sources	DOE O 460.2	10 CFR 73.37	10 CFR 71.97
Who is notified	Governors or designees and designated tribal points of contact	Governors or designees ⁴	Governors or designees
Time of notification	Postmarked at least 7 days before shipment if mailed, 4 days by messenger	Postmarked at least 7 days before shipment if mailed, 4 days by messenger	Postmarked at least 7 days prior to 7 day period when shipment departure is estimated, 4 days by messenger
Notification of schedule change	By telephone if greater than 6 hours	By telephone if greater than 6 hours	By telephone if outside of 7-day period
Information to be included in notification	<ol style="list-style-type: none"> 1. name, address, and telephone number of shipper, carrier, and receiver; 2. description of shipment 3. a list of routes to be used within the state or through tribal jurisdictions; 4. estimated date and time of departure from point of origin; 5. estimated date and time of entry into the Governor's state or into tribal lands; 6. estimated date and time of departure from Governor's state or tribal jurisdiction (when the destination is not within the state) 	<ol style="list-style-type: none"> 1. name, address, and telephone number of shipper, carrier, and receiver; 2. description of shipment 3. a list of routes to be used within the state; 4. estimated date and time of departure from point of origin; 5. estimated date and time of entry into the Governor's state; 6. Statement on safeguarding schedule information 	<ol style="list-style-type: none"> 1. name, address, and telephone number of shipper, carrier, and receiver; 2. description of the shipment 3. point of origin and 7-day period when departure is estimated 4. 7-day period during which arrival at state is estimated 5. destination and 7-day period when arrival is estimated 6. point of contact
Safeguard requirements	None	Schedule information for 10 days after shipment per 10 CFR 73.21(b)(2)(ii)	None

⁴ DOE has requested that NRC amend this to also permit notification to tribal authorities. NRC issued an Advanced Notice of Proposed Rulemaking regarding tribal prenotification on 12-21-99.

8.2.2 Classified National Security Shipments

Classified national security shipments that meet safeguards and security requirements, including Naval spent fuel shipments, do not provide shipment prenotifications. The Atomic Energy Act of 1954 provides security requirements for the protection of information related to nuclear weapons and special nuclear materials shipments. The DOT exemption for national security shipments is stated in 49 CFR 173.7(b).

9. TRANSPORTATION OPERATIONAL CONTINGENCIES

9.1 Introduction

This section addresses operational contingencies taken in response to adverse weather, natural disasters, vehicle breakdown, travel and road/rail conditions, and unanticipated delays that could interrupt normal transportation of DOE shipments of radioactive materials. This includes determinations made prior to departure and while en route. Accidents and incidents are addressed in the Emergency Notification and Emergency Response sections.

9.2 Transportation Operational Contingencies - Highway

9.2.1 Non-Classified Shipments

- a. Spent Nuclear Fuel, High-Level Waste, Tritium-Bearing Reactor Components, and Transuranic Waste Shipments to WIPP. Before dispatch, the shipper and the carrier must agree that travel conditions are considered to be acceptable. Current weather conditions, weather forecast(s), and projected road conditions at the point of origin and along the entire route must be considered before dispatching a shipment. Information on weather and road conditions may be obtained from state information numbers and from other sources.

Shipments should not be dispatched or travel if severe weather or bad road conditions make travel hazardous or if the forecast predicts severe weather or bad road conditions that would affect the safety of the shipment. Severe weather conditions are defined to include such National Weather Service storm warnings as the following:

- winter storm warning,
- heavy snow warning,
- blizzard warning,
- blowing and drifting snow,
- freezing rain/drizzle,
- dense fog advisory,

- tornado warning,
- severe thunderstorm warning,
- flash flood warning,
- tropical storm warning,
- high-wind warning,
- hurricane warning, and
- river flood warning.

Adverse road conditions are defined as those that prompt travel advisories suggesting that unnecessary travel be avoided (e.g., winter storm watches and snow advisories).

States and tribes may provide input on weather and road conditions, and specific transportation plans may provide additional details on the input process. States and tribes may monitor the status of shipments using TRANSCOM. When adverse weather and road conditions occur, states and/or tribes may notify DOE that a shipment should use an alternate route or be diverted to a safe parking location to avoid the adverse conditions.

In the event of a substantial unanticipated delay en route (e.g., greater than 2 hours), the affected states and tribes will be notified of the event by TRANSCOM.

- b. Low-Level and Mixed Low-Level Waste. Carriers are expected to exercise due caution and care in dispatching shipments. The carrier will determine the acceptability of weather and road conditions and if a shipment should be held before departure and when actions should be taken while en route. Shipments should not be dispatched or travel if severe weather or bad road conditions make travel hazardous. Current weather conditions, the weather forecast, and road conditions should be considered before dispatching a shipment. Conditions at the point of origin and along the entire route should be considered. Adverse operating conditions may be reported to the DOE shipper through various means (e.g., communications with the carrier, information issued by State, tribal, or local authorities). Each report to the shipper is addressed in consultation with the carrier.
- c. Isotopes. The carrier will determine the acceptability of weather and road conditions and will determine if a shipment should be held before departure and when actions should be taken while en route. The carrier will inform the shipper of any significant delays.

9.2.2 Classified National Security Shipments

Weather conditions are monitored and updated by the DOE Albuquerque Operations Office Secure Communications Center, SECOM. No travel will occur if severe weather conditions along routes or adverse road conditions make travel hazardous. If adverse conditions are

encountered en route, drivers will locate an acceptable parking area as described in the Safe Parking section of this Manual.

9.3 Transportation Operational Contingencies - Rail

Rail carriers use train control and monitoring systems to identify the location of their trains within the rail system and to make informed decisions based on this information to avoid or minimize potential weather-related or track condition risks. Under 49 CFR 174.20, the carrier may impose local restrictions on transportation when local conditions make travel hazardous. Adverse operating conditions can be reported to the DOE shipper through several means (e.g., communications with the carrier, information provided by State, tribal, or local authorities). Each report to the shipper is addressed in consultation with the carrier. If an accident or incident results or develops, the DOE shipper will consult with appropriate states and tribes in accordance with the Emergency Notification and Emergency Response sections of this Manual.

10. TRACKING

10.1 Introduction

This section addresses DOE practices for tracking the location of shipments of radioactive materials and facilitating communication with the drivers/crew of the vehicles. Tracking is the process by which the geographic location of shipments are monitored along the transportation route.

10.2 Tracking - Highway and Rail Modes

10.2.1 Non-Classified Shipments

- a. Spent Nuclear Fuel, High-Level Waste, and Tritium-Bearing Reactor Components, Transuranic Waste Shipments to WIPP. Near real-time position tracking (i.e., tracking that is updated every 3-5 minutes) and communications for all shipments will be provided by TRANSCOM. The TRANSCOM users' manual discusses backup procedures to be used in the event of operational problems with TRANSCOM. TRANSCOM access is limited to users authorized by the cognizant DOE program office and in coordination with the National Transportation Program. Access to information on a particular shipment is controlled by the cognizant DOE program office to provide timely information to eligible corridor states and tribes.

For spent fuel shipments covered by the NRC, user designation and access will be consistent with NRC regulations to ensure that safeguards information, such as schedules and itineraries for specific shipments, is protected against unauthorized disclosure and is provided only to authorized individuals. In the event of an emergency, TRANSCOM

will give information on the emergency to contacts described in the Emergency Notification protocol.

- b. Other TRU Shipments. DOE is examining the requirements to be used for these shipments.
- c. Low-Level and Mixed Low-Level Waste. Not tracked by a DOE tracking system. Carriers track their shipments by various means and can provide shipment information on an as-needed basis as requested by the shipper.
- d. Isotopes. Not tracked by a DOE tracking system. Carriers track their shipments by various means and can provide shipment information on an as-needed basis as requested by the shipper.

10.2.2 Classified National Security Shipments

The Office of Transportation Safeguards maintains 24-hour-a-day tracking and monitoring capability through SECOM. Information is available only on a classified need-to-know basis. In an emergency, information would be provided on an unclassified, need-to-know basis.

11. INSPECTIONS

11.1 Introduction

This section addresses inspections of DOE radioactive materials shipments, including both verifications of vehicle safety and radiological safety of containers loaded on the vehicles.

11.2 Inspections - Highway

11.2.1 Non-Classified Shipments

- a. Spent Nuclear Fuel, High-Level Waste, Tritium-Bearing Reactor Components, and Transuranic Waste Shipments to WIPP. The shipper and/or carrier will perform preshipment inspections to ensure compliance with regulatory standards. Shipments will also be made available for inspection prior to departure by CVSA-certified State inspectors unless other arrangements have been made with the state. It is expected that inspections will be conducted in accordance with the CVSA Enhanced (Level VI) North American Standard Inspection Procedures.⁵ The CVSA enhanced inspection procedure imposes more stringent criteria for placing a vehicle out-of-service, includes additional inspection and out-of-service criteria items compared to the CVSA level I inspection, and adds a radiological survey. Shipments cannot proceed until any Level VI violation has

⁵ CVSA is an organization that brings together Federal, State, and provincial government agencies and private industry in the United States, Canada, and Mexico, and is dedicated to improving commercial vehicle safety.

been corrected consistent with Federal regulations. Shipments en route may be inspected using the Level VI inspection criteria at the discretion of the states and tribes, or as required by state-specific regulations.

Postshipment inspections will be conducted by the receiver, and by states at their discretion (but not to impact unloading operations), in accordance with applicable regulations. Any postshipment inspection that reveals a regulatory non-compliance will be handled in accordance with applicable requirements. Routinely, the package, its tie-downs, and associated transportation system hardware are visually inspected at the point of destination to ensure that no physical damage occurred during transit.

- b. Low-Level and Mixed Low-Level Waste and Isotopes. Preshipment inspections will be done by the shipper and/or carrier to ensure compliance with regulatory standards. Inspections may be done at the discretion of the states, in accordance with CVSA North American Standard Inspection (Level I) criteria, or in accordance with individual State requirements.

11.2.2 Classified National Security Shipments

DOE's fleet of vehicles, operated by the Office of Transportation Safeguards, transports classified shipments. All Office of Transportation Safeguards vehicles are required to undergo a complete maintenance inspection prior to transporting national security shipments. The vehicle safety inspection standards used by the Office of Transportation Safeguards meet or exceed those contained in the CVSA Level VI inspection. The provisions of 49 CFR 173.7(b) exclude these shipments from coverage by DOT regulations 49 CFR 171 through 189. Security and technical considerations for these shipments do not permit adherence to all of the regulations. However, as a good practice, the Office of Transportation Safeguards voluntarily follows those regulations that are compatible with security and technical requirements.

11.3 Inspections - Rail (Classified and Non-Classified)

11.3.1 Spent Nuclear Fuel and High-Level Waste

Transport equipment and radiological inspections will be performed at the origin facility prior to every shipment. These inspections may be performed by Federal, State, or carrier inspectors and will be conducted to ensure compliance with applicable Federal and State regulations, Association of American Railroads rules, and industry standards. For classified shipments (e.g., naval spent fuel shipments) special arrangements with the DOE shipper will be required for a Federal or State inspection at an origin. Specifically, equipment inspectors will conduct an inspection of the cask and idler (buffer) cars and the escort vehicle (if used) at the point of origin to ensure compliance with the Safety Appliance, Power Brake, and Freight Car FRA Standards, and industry rules and recommended practices. Hazardous materials inspectors will conduct an inspection of the cask and cask car to ensure compliance with applicable Hazardous Materials Regulations concerning placarding, shipping papers, crew notification, train placement, and

securement requirements. A shipment cannot proceed if it does not comply with applicable FRA requirements. Inspections may be performed en route at suitable locations (e.g., rail yards) by the FRA and State agencies through the FRA state participation program.

The receiver will conduct post-shipment inspections in accordance with applicable regulations. Any postshipment inspection that reveals a regulatory non-compliance will be handled in accordance with applicable requirements. Routinely, the package, its tie-downs, and associated transportation system hardware are visually inspected at the point of destination to ensure that no physical damage occurred during transit.

11.3.2 Transuranic Waste Shipments to WIPP

No rail shipments to WIPP are currently planned. A section for rail shipments to WIPP will be developed if a decision is made to utilize rail.

11.3.3 Low-Level and Mixed Low-Level Waste

Equipment inspections may be performed by the FRA and state agencies through the FRA state participation program. Hazardous material inspections may be performed by appropriate State agencies.

12. SAFE PARKING

12.1 Introduction

This section addresses the criteria to be used in selecting appropriate safe parking locations in the event that transportation operational contingencies occur as described in the Transportation Operational Contingencies section of this Manual. Safe parking is the process used to identify and designate parking locations and to identify criteria for selecting parking areas if a predesignated location cannot be reached.

12.2 Safe Parking - Highway

12.2.1 Non-Classified Shipments

- a. Spent Nuclear Fuel, High-Level Waste, Tritium-Bearing Reactor Components, and Transuranic Waste Shipments to WIPP. Selection of safe parking areas will be coordinated with the states and tribes through which the shipments will pass. State, tribal, and local law enforcement personnel have the authority to direct shipments to specific parking areas. If State or tribal officials (normally, law enforcement personnel) determine that a route deviation rather than safe parking is necessary, they can inform the driver or carrier through direct contact or through TRANSCOM.

The two key factors in selecting a safe parking area are desirability of a particular type of parking area and driver/crew ability to reach that parking area under different types of conditions related to the local weather, road conditions and factors causing the unanticipated delay or emergency.

To the extent practicable, safe parking areas selected should—

- provide adequate separation from other vehicles carrying hazardous materials,
- facilitate required security (e.g., lighting), and
- provide adequate driver/crew services.

Carriers should first consider parking at a DOE facility or other Federal facility, as identified in the applicable transportation plan. States and tribes may also specify facilities to be used, such as weigh stations, State highway service facilities, and National Guard facilities.

If none of these choices can be reached safely, the following avoidance factors should be applied in selecting a suitable safe parking location. However, it may not be possible to locate a parking site that meets all of the criteria listed. The carrier should attempt to avoid—

- highly populated areas,
- heavily industrialized areas (e.g., refineries),
- hospitals and schools,
- areas with difficult access (e.g., no room for fire equipment),
- crowded parking areas (e.g., shopping malls),
- residential areas,
- highway shoulders, and
- areas with numerous pedestrians.

The carrier must not be parked on or within 5 feet of the traveled portion of a public street or highway except for brief periods when the necessities of operation require the vehicle to be parked and make it impracticable to park the vehicle in any other place.

For shipments covered by a transportation plan, the plan would identify safe parking areas.

b. Low-Level and Mixed Low-Level Waste

Carriers are expected to exercise due caution and care in selecting parking locations, following normal operating practices and DOT regulations. [The provisions of 49 CFR 397.7(b) state that hazardous materials must not be parked on or within 5 feet of the traveled portion of a public street or highway except for brief periods when the necessities of operation require the vehicle to be parked and make it impracticable to park the vehicle in any other place.] State, tribal, and local law enforcement personnel have the authority to direct shipments to specific parking areas.

c. Isotopes

Safe parking locations will be determined by the carrier following normal operating practices and DOT regulations.

12.2.2 Classified National Security Shipments

The Office of Transportation Safeguards has in effect a safe havens agreement with the Department of Defense (DoD). The Office of Transportation Safeguards can also use DOE facilities for such protected parking. Also, safe parking can be arranged with the assistance of State and/or local police. The Office of Transportation Safeguards will notify a state for assistance in locating safe parking if DOE and DoD facilities are unavailable; however, the Office of Transportation Safeguards will exhaust all efforts to use DOE and DoD facilities first.

12.3 Safe Parking - Rail

To the extent practicable, safe parking areas should be selected to provide adequate separation from other hazardous materials and to facilitate required security. In the event of adverse operating conditions, the carrier would decide where to locate the affected railcar(s). Within a DOE facility is the most desirable location, and another Federal facility is a secondary option; the third choice would be a protected "siding," a safe, secure position along the track controlled by the railroad. Any additional security required from the State, tribal, or local law enforcement will be coordinated by the shipper and/or the rail carrier. Specific transportation plans may specify additional criteria.

13. EMERGENCY NOTIFICATION

13.1 Introduction

This section of the Manual addresses the process DOE uses to notify State and tribal officials of a transportation emergency involving DOE radioactive materials. It does not address the initial

notifications made by the carrier or others to local emergency response organizations. Emergency notifications to State and tribal points of contact occur after DOE, as the shipper, receives notification of an emergency. Notification to DOE may come from local responders or others (see Section 13.3). This guidance applies to all classified and non-classified DOE rail and highway shipments of radioactive material.

13.2 Criteria for Identifying an Emergency Situation Requiring Notification

Criteria to identify a situation as an emergency include the following:

- a person is killed, or
- a person requires hospitalization due to major injuries received as a direct result of the radioactive material or an accident, or
- an evacuation of the general public, or
- one or more major transportation arteries or facilities are closed or shut down as a direct result of the radioactive material cargo, or
- fire, potential release, or suspected radioactive contamination involving a radioactive material shipment, or
- a security incident (i.e., sabotage, theft).

Additional specific criteria may be included in programmatic transportation plans.

If DOE, as the shipper, is notified of an event that does not clearly meet the reporting criteria listed above, DOE will determine whether notification to State and tribal points of contact is appropriate. Any uncertainty as to whether a notification should or should not be made will be resolved by making the notification.

13.3 Emergency Notification Responsibilities

13.3.1 DOE, as the shipper, will receive notification of an accident/incident from one of the following sources:

- driver, dispatcher, and/or Government escort;
- State/tribal/local law enforcement, emergency medical, fire, and/or rescue personnel;
- satellite tracking system (e.g., TRANSCOM), when in use.

13.3.2 When notified of an emergency situation based on the criteria identified above, the DOE shipper will conduct the following notifications in accordance with applicable DOE requirements:

- to designated State and/or tribal 24-hour points of contact (where the event occurs);
- to the cognizant DOE Regional Coordinating Office (RCO), which may notify additional State/tribal contacts within their respective regions (e.g., adjacent states and tribes);
- to appropriate DOE offices, including the DOE receiving site and the DOE Headquarters Watch Office.

The DOE shipper will also make other applicable notifications in accordance with existing site transportation emergency plans, memorandums of agreement, or campaign-specific transportation plans. (Note: When TRANSCOM is utilized, electronic notification may be provided to the corridor states by TRANSCOM in addition to telephone contacts identified above.)

13.3.3 For WIPP shipments, in addition to the notifications identified in Section 13.3.2 above, notification will be provided to additional State and/or tribal organizations' points of contact (where the event occurs), as specified in the WIPP Transportation Manual. In the event that NRC-approved packaging is damaged, the WIPP contractor will notify the NRC in accordance with 10 CFR 71.95.

13.3.4 For the Office of Civilian Radioactive Waste Management shipments, the shipper will notify the NRC. These notifications will be in addition to the notifications identified in Section 13.3, above.

13.3.5 The DOE Headquarters Watch Office will notify DOE offices and Headquarters offices of other appropriate Federal agencies. The DOE Headquarters Watch Office and other DOE field elements will assist, as requested, in making emergency notifications. DOE field elements may also notify appropriate regional offices of other Federal agencies.

13.3.6 In addition to the notifications described above, DOE Headquarters and/or field elements will inform appropriate elected officials.

13.3.7 Follow-up communication is covered in the Emergency Response section.

13.4 Type of information to be provided during notification process as it becomes available

- a. identity of the caller and call-back telephone number;
- b. location, date, and time of the event;

- c. brief description of the event, including hazards of the material being shipped, injuries, environmental releases and/or personnel exposures, protective actions implemented, protective actions recommended, on-scene responders;
- d. other notifications that have been made, including media interest.

13.5 Maintenance of State/tribal 24-hour point-of-contact list

The DOE Headquarters National TEPP Coordinator will maintain a central database that contains the 24-hour emergency points of contact for states and tribes. DOE shippers will be able to access the list of points of contact through the Internet. The database must be reviewed annually and the DOE Regional TEPP Coordinators must provide interim changes throughout the year.

For Office of Transportation Safeguards Classified Shipments, the Office of Transportation Safeguards sends out a formal request every 2 years to all State governors in the continental United States for emergency points of contact. These numbers are maintained in the Office of Transportation Safeguards' SECOM control center.

13.6 Non-Emergency Events

In addition to emergency notifications discussed in this section, specific DOE programs, in cooperation with State and tribal organizations, may provide additional notifications in response to non-emergency events, such as vehicle breakdowns. Such notifications will be made in accordance with the Transportation Operational Contingencies section.

14. EMERGENCY RESPONSE

14.1 Introduction

This section addresses DOE response to a transportation emergency involving DOE rail and highway shipments (classified and unclassified) of radioactive materials. It includes ongoing interactions with State, tribal, and local officials as part of incident crisis communications. It is recognized that local government officials and agencies play a key role in transportation emergency response, likely initiating the response. Emergency response includes the actions taken by DOE in a transportation emergency as described in the Emergency Notification section.

14.2 Emergency Response

- 14.2.1 DOE will provide assistance in accordance with Federal statutes and regulations to support State, tribal, and local authorities. State, tribal, and local governments have the primary responsibility and authority to respond to and manage emergencies within their jurisdiction. Incident command is the responsibility of State, tribal, or local

government(s). If the incident involves an Office of Transportation Safeguards classified shipment, the Office of Transportation Safeguards will establish a unified command to work closely with State/local incident command.

14.2.2 The DOE shipper will accomplish the actions below.

- a. Make emergency notifications as identified in the Emergency Notification section to designated State and tribal points of contact.
- b. Conduct follow-up communication on DOE activities (i.e., situation updates and reports, status updates on recovery planning and termination of the event) with states and tribes as needed for that particular incident.
- c. Provide shipment-specific emergency information and access to DOE/contractor personnel for technical advice and detailed information as requested by on-scene response personnel.
- d. Implement transportation emergency response procedures [e.g., activating site emergency organizations or operations center(s), declaring an operational emergency, activating site-specific transportation emergency plans, escorts]. Site-specific procedures may be addressed in transportation plans or a campaign-specific plan.
- e. Assist in the coordination of DOE resources to provide additional radiological support/technical assistance if requested.
 - (1) Radiological assistance will be coordinated by the cognizant RCO. The shipper may provide assistance with coordination and provision of additional radiological assessment, as needed.
 - (2) The shipper will coordinate with DOE Headquarters and the appropriate DOE RCO to identify additional DOE technical resources (programmatic, public information, emergency communication capability, and/or security personnel) to be deployed to the incident scene. These DOE representatives will provide additional technical assistance/support to the responsible on-scene authority.
 - (3) For WIPP shipments, the shipper may call upon the Incident/Accident Response Team, which will—
 - (a) provide technical expertise in determining the status of the package(s) and transporter including the tractor/trailer used in the shipment;
 - (b) assist the carrier, through the senior onsite DOE official, in the development of the incident site-specific recovery plan; and

- (c) provide oversight of the TRU-waste carrier's cleanup operations.
- f. Coordinate with DOE Headquarters, the cognizant DOE Operations/Area Office, and the cognizant RCO in the affected region to designate a Federal On-scene Coordinator/Commander or Senior Energy Official, as applicable, and conduct activities if an emergency occurs that warrants a Federal response under an applicable Federal plan [e.g., the National Contingency Plan (hazardous/radioactive material response), the Federal Radiological Emergency Response Plan (radiological response), the Federal Response Plan (natural disaster response)].
- g. Assist in the coordination of DOE resources to provide information to the public regarding the emergency and the response.
- h. Provide information about the shipment, general public hazard, and other information as requested by the incident commander or responder to support public information needs for non-classified shipments. It is expected that the on-scene local, State, or tribal incident commander or responder will release appropriate public information according to established local, State, or tribal emergency preparedness communications plans.
- i. If a DOE public information officer is sent to the scene, the public information officer will report to the incident commander and will serve as the DOE public information liaison between the scene and appropriate DOE offices. The DOE public information officer will assist the incident commander or his/her public information officer in public information and media activities with the local, State, and tribal authorities. If a joint information center is established by the on-scene commander, the DOE public information officer will report to the joint information center and support public information efforts. The DOE public information officer will provide copies of statements and news releases and provide updates about the incident and the response as needed to the public information points of contact.
- j. The cognizant DOE program office, in coordination with the DOE shipper and the Office of Public Affairs, must issue statements or news releases about the incident as deemed appropriate, in a timely manner, appropriate to the severity of the event. DOE offices should attempt to review news releases or statements that reference State, tribal, or local actions with the appropriate authority before release. Likewise, DOE offices should attempt to review news releases or statements from State, tribal, or local authorities that describe the DOE shipment or DOE actions before release.
- k. In a transportation accident or incident involving a classified national security shipment, public information will be handled by the DOE representative on-scene until a DOE public information officer arrives with the responding Radiological Assistance Program (RAP) Team. Public information will be under the control of the Senior Energy Official on-scene until relieved. All public information releases will be coordinated with DOE Albuquerque Operations Office and DOE Headquarters; releases regarding naval spent

fuel shipments will be coordinated with the Naval Nuclear Propulsion Program. Sufficient non-classified information will be provided to explain the emergency and any protective actions required for health and safety of workers, the public, and the environment. The DOE RAP team public information officer will coordinate media activities with local, State, and tribal public information officers and will brief any media at the incident scene about DOE activities and provide appropriate shipment information. The DOE RAP team public information officer, in conjunction with local, State, tribal public information officers, will determine the need for activation of a joint information center. Releases will be coordinated with State, tribal, and local authorities as described in Section 14.2.2.c.

14.2.3 The carrier, as part of the emergency response, will—

- a. promptly notify the DOE shipper's 24-hour emergency response notification number when an emergency has occurred;
- b. forward any calls to the DOE shipper from emergency responders seeking technical advice and detailed information regarding the shipment;
- c. give notice to DOT if required by 49 CFR 171.15; and
- d. respond to the requests of State, tribal, and local government authorities regarding recovery activities and coordinate activities with the DOE shipper.

14.2.4 The cognizant DOE RCO will accomplish the following:

- a. Provide radiological assistance, including deployment of RAP team(s), upon request of DOE or appropriate State or tribal authority. Support for radiological assistance will be coordinated with DOE Headquarters and the shipper. Assistance for radiological monitoring may be requested from the appropriate DOE RCO (see map attached to Emergency Planning section).
- b. Assist in the coordination of other radiological assets (e.g., Aerial Measurement System, Atmospheric Release Advisory Capability, Federal Radiological Monitoring and Assessment Center, Radiation Emergency Assistance Center/Training Site).

14.2.5 Additional DOE response activities may be identified in DOE site transportation emergency plans, memorandums of agreement, campaign-specific transportation plans, or emergency response plans.

15. RECOVERY AND CLEANUP

15.1 Introduction

This section addresses post-emergency actions taken to recover and clean up from an accident or incident involving shipments of DOE radioactive materials. Carriers have primary responsibility for recovery and cleanup, and will coordinate with State, tribal, and local agencies regarding these activities. DOE will coordinate with carriers, and with State, tribal, and local authorities to ensure that cleanup is done to an acceptable level.

15.2 Highway

All carriers of radioactive material must meet the financial requirements that are set out in 49 CFR 387.7 and in the amounts set in 387.9. In addition, coverage would be provided under provisions of the Price-Anderson Amendments Act (Public Law 100-408). The DOE Office of General Counsel has issued a report on Price-Anderson coverage that is available on its Web site at www.gc.doe.gov. Additional information on the Price-Anderson Amendments Act can be found in Appendix E of "Guidance for Developing State, Tribal, and Local Radiological Emergency Response Planning and Preparedness for Transportation Accidents," FEMA-REP-5.

15.2.1 Non-Classified Shipments

a. Spent Nuclear Fuel, High-Level Waste, Tritium-Bearing Reactor Components, and Transuranic Waste Shipments to WIPP.

DOE will ensure that carriers have specific written procedures for providing recovery and cleanup in the event of an accident or incident, or that they have a contract with a remediation company.

For spent nuclear fuel shipments subject to the NWPA, DOE will require the carrier of spent nuclear fuel to comply with ANSI N14.27 ("For Truckload Quantities of Radioactive Materials - Carrier and Shipper Responsibilities and Emergency Response Procedures for Highway Transportation Accidents") regarding recovery and cleanup activities. (ANSI N14.27 requires the carrier to provide appropriate resources for dealing with the consequences of an accident, including isolating and cleaning up spills, and to maintain working contact with the responsible governmental authority until the latter has declared the incident to be satisfactorily resolved and closed.)

b. Low-Level and Mixed Low-Level Waste.

DOE will review truckload carriers' plans for recovery and cleanup or verify that they have a contract with a remediation company.

c. Isotopes.

Carriers must comply with 49 CFR 387.7.

15.2.2 Classified National Security Shipments

The Office of Transportation Safeguards has contingencies in place that address recovery issues. DOE or the Office of Transportation Safeguards will provide the personnel and equipment needed to perform recovery and cleanup operations.

15.3 Rail

For spent nuclear fuel, high-level waste, TRU waste to WIPP, LLW, and MLLW shipments, DOE will ensure that rail carriers have specific written procedures for providing recovery and cleanup in the event of an accident or incident. In addition, coverage would be provided under provisions of the Price-Anderson Amendments Act.

DOE ORGANIZATIONS TO WHICH DOE M 460.2-1 IS APPLICABLE

Office of Civilian Radioactive Waste Management
Office of Environmental Management
National Nuclear Security Administration
Office of Nuclear Energy, Science and Technology
Office of Science
Office of Security
Albuquerque Operations Office
Nevada Operations Office
Chicago Operations Office
Oakland Operations Office
Oak Ridge Operations Office
Richland Operations Office
Savannah River Operations Office
Idaho Operations Office
Golden Field Office
Rocky Flats Field Office
Ohio Field Office

DOE ORGANIZATIONS TO WHICH DOE M 460.2-1 IS NOT APPLICABLE

Office of the Secretary
Chief Information Officer
Office of Congressional and Intergovernmental Affairs
Office of Counterintelligence
Departmental Representative to the Defense Nuclear Facilities Safety Board
Office of Economic Impact and Diversity
Office of Energy Efficiency and Renewable Energy
Energy Information Administration
Office of Environment, Safety and Health
Office of Fossil Energy
Office of General Counsel
Office of Hearings and Appeals
Office of Independent Oversight and Performance Assurance
Office of the Inspector General
Office of Intelligence
Office of Management, Budget and Evaluation and Chief Financial Officer
Office of Policy and International Affairs
Office of Public Affairs
Secretary of Energy Advisory Board
Office of Worker and Community Transition
Office of Energy Assurance
Bonneville Power Administration
Southeastern Power Administration
Southwestern Power Administration
Western Area Power Administration

CONTRACTOR REQUIREMENTS DOCUMENT

DOE M 460.2-1, *Radioactive Material Transportation Practices Manual*

Contractors performing transportation and packaging work for the Department of Energy (DOE), including the National Nuclear Security Administration (NNSA), must comply with requirements that pertain to radioactive material. Regardless of the performer of the work, the contractor is responsible for compliance with the requirements of this CRD. The contractor is responsible for flowing down the requirements of this CRD to subcontractors at any tier to the extent necessary to ensure the contractors' compliance with the requirements. The contractor shall follow these additional requirements for radioactive material and radioactive waste:

1. General. Notwithstanding the exemption available through the National Security Provision [Title 49, Code of Federal Regulations (CFR), part 173.7(b)], all shipments will comply with the requirements of 49 CFR 100–185, except those that infringe upon maintenance of classified information.
2. Transportation of Radioactive Material and Radioactive Waste. Specific requirements that must be followed include:
 - a. Transportation Planning. The contractor must prepare a transportation plan with information on shipments of spent nuclear fuel, high-level waste, tritium-bearing reactor components, and transuranic waste shipments to the Waste Isolation Pilot Plant (WIPP) and submit it to the appropriate field element. The plan must describe the material type, shipping dates, estimated number and weight of shipments, mode of transport, carrier proposed route, packaging description, and cargo security arrangements. For the shipments identified above, the contractor must prepare campaign- or shipment-specific public information materials.
 - b. Routing. For nonclassified shipments (by highway and rail) of spent nuclear fuel, high-level waste, and tritium-bearing reactor components, the contractor will perform an analysis of proposed routes using transportation models such as Transportation Routing Analysis Geographic Information System.
 - c. Carrier/Driver Requirements. Upon request from the field element or DOE, the contractor must evaluate carriers. For carriers that transport highway route controlled quantities of radioactive material in less-than-truckload or truckload (TL) quantities, any TL quantities of radioactive material or hazardous waste will be evaluated by the contractor. A copy of the evaluation document must be provided by the contractor to the field element within 30 days after completion of the carrier evaluation.

- d. Shipment Prenotification. Before shipping spent fuel or high-level waste within or through a State or tribal jurisdiction, the contractor must prepare a letter, to be sent by registered mail with return receipt, to the State Governor (or the Governor's designee) and tribal President or Governor (or tribal designee) postmarked at least 7 days before the shipment. Alternatively, a notification may be delivered by messenger to these same representatives at least 4 days before a shipment is transported within or through the State or tribal jurisdiction. A record must be retained in the shipping records file that includes the names of the persons contacted and the dates and times of the contacts.
- e. Transportation Operational Contingencies. For spent fuel, high-level waste, tritium-bearing reactor components, and transuranic waste shipments to WIPP, the contractor must concur with the carrier that travel conditions are considered acceptable before dispatch. In the event of any substantial unanticipated delay in transit, the contractor will notify the affected states and tribes of the event through the DOE Transportation Tracking and Communications System (TRANSCOM).
- f. Tracking. The contractor must use TRANSCOM for tracking and monitoring the following categories of shipments:
- (1) spent nuclear fuel (see DOE M 5632.1C-1, *Manual for Protection and Control of Safeguards and Security Interests*, Chapter IV);
 - (2) tritium-bearing reactor components;
 - (3) high-level waste; and
 - (4) transuranic waste destined for WIPP.
- g. Inspections. The contractor must ensure preshipment inspections are done by the shipper and/or carrier to ensure compliance with regulatory standards. For highway shipments of spent nuclear fuel, high-level waste, tritium-bearing reactor components, and transuranic waste shipments to WIPP, the contractor must ensure shipments are made available, before departure, for inspection by certified State inspectors [Commercial Vehicle Safety Alliance Enhanced North American Standard Inspection Procedures (Level VI)] unless other arrangements have been made with the State.
- h. Recovery and Cleanup. The contractor must review truckload carriers' plans for recovery and cleanup or verify they have a contract with a remediation company. For shipments of spent fuel, high-level waste, tritium-bearing reactor components, and transuranic waste shipments to WIPP, the contractor must ensure carriers have specific written plans and procedures for providing recovery and cleanup in the event of an accident or incident.

GLOSSARY

Note: The following definitions are provided for the convenience of the reader in understanding the usage of these terms within this document. These definitions apply only to this document. Where available, the sources of the definitions are shown in parenthesis.

Carrier. An entity engaged in the transportation of passengers or property by land or water as a common, contract, or private carrier, or by civil aircraft. (See 49 CFR 171.8.) (A common carrier is a for-hire carrier that holds itself out to serve the general public at published rates. A contract carrier offers transportation services to certain shippers under contracts that specify charges to be applied, the character of the service, and the time of performance.)

Classified National Security Shipments. Classified shipments of nuclear explosives, nuclear weapons, nuclear weapon components, strategic quantities of special nuclear materials, and special assemblies and shipments of spent nuclear fuel from the Naval Nuclear Propulsion Program.

Dedicated Train. A train where the cargo-carrying cars remain coupled from the point of origin to the point of destination, except for routine rail switching and handling, and whose only freight is a single commodity.

Environmental Restoration. Restitution for the loss, damage, or destruction of natural resources arising out of the accidental discharge, dispersal, release, or escape into or upon the land, atmosphere, watercourse, or body of water of any commodity transported by a motor carrier. This includes the cost of removal and the cost of necessary measures taken to minimize or mitigate damage to human health, the natural environment, fish, shellfish, and wildlife. (49 CFR 387.5)

High-level Waste. The highly radioactive waste material that results from the reprocessing of spent nuclear fuel in a commercial or defense facility, including liquid waste produced directly in reprocessing and any solid waste derived from the liquid, that contains a combination of TRU waste and fission products in concentrations requiring permanent isolation. (See 10 CFR 960.2.)

Highway Route Controlled Quantity. A quantity of radioactive material within a single package that exceeds 3,000 times that allowed in a Type A package or is greater than 1,000 Tbq (27,000 Ci), whichever is least. (See 49 CFR 173.403)

Isotopes. Radioactive materials produced by DOE's Isotopes Programs to be used for medical, industrial, or research purposes.

Low-level Waste. Radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e(2) of the Atomic Energy Act of 1954, as amended), or naturally occurring radioactive material. (DOE M 435.1-1)

Mixed Low-level Waste. Low-level waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and hazardous wastes as defined by the Resource Conservation and Recovery Act and the Toxic Substances Control Act.

Prospective Shipments Module. A database which provides planning information on prospective DOE radioactive materials shipments, including spent nuclear fuel and highway route controlled quantity shipping campaigns, and other high-visibility radioactive materials shipments as designated by DOE.

Radioactive Material. Any material having a specific activity greater than 70 Bq per gram (0.002 microcurie per gram) (49 CFR 173.403).

Radioactive Waste. Material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and of negligible economic value considering costs of recovery.

Shipment Safeguards Information. An integrated system of physical protection, material accounting, and material control measures designed to deter, prevent, detect, and respond to unauthorized possession, use or sabotage of nuclear materials. Information that specifically identifies measures taken for the physical protection of special nuclear material, or measures taken for the physical protection of equipment vital to the safety of operations at fixed sites and in transit. Safeguards information includes the transportation physical security plan; schedules and itineraries for specific shipments; details of vehicle immobilization features, intrusion alarm devices, and communication systems; arrangements with, and capabilities of, local police response forces; locations of safe parking; details regarding limitations of radio-telephone communications; and procedures for response to safeguards emergencies.

Shipper. The entity (or its agent) that tenders a shipment for transportation. The term includes persons who prepare packages for shipment, and offer packages to a carrier for transportation by signature on the shipping paper. When a contractor signs a shipping paper on behalf of DOE, DOE is considered to be the shipper of record.

Special Train. A train that includes operating or handling requirements specified by the shipper and/or required by the rail carrier which are not typical of regular freight train service.

Spent Nuclear Fuel. Whole fuel assemblies that have been permanently withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing. (10 CFR 960.2, 40 CFR 191.02).

Transuranic Waste. Waste contaminated with alpha-emitting transuranic radionuclides (elements above uranium in the periodic table; that is, with an atomic number greater than 92) with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram. (See 40 CFR 191.02.)

Tritium-bearing Reactor Components. Absorber rods that replace the normally used burnable absorber rods (nuclear reactor rods used to capture or absorb neutrons) for the purpose of producing tritium.

Type A Packaging. Packaging designed to retain the integrity of containment and shielding required by regulation under normal conditions of transport as demonstrated by tests. (See 49 CFR 173.403.) (Examples of Type A packagings are steel drums and standard waste boxes. Examples of materials shipped in Type A packagings include medical isotopes and low-level radioactive wastes.)

Type B Packaging. Packaging designed to retain the integrity of containment and shielding by regulation when subjected to the normal conditions of transport and hypothetical accident test conditions set forth in 10 CFR Part 71. (See 49 CFR 173.403.) (Examples of Type B packagings are TRUPACT-II, HalfPact, GE Model-2000, and the NAC-LWT cask. Type B packagings are used to transport materials with high radioactivity levels including spent nuclear fuel; high-level radioactive waste; cobalt sources, and other such radioisotopes.)

Unclassified Controlled Nuclear Information. Certain unclassified but sensitive Government information concerning nuclear material, weapons, and components whose dissemination is controlled under section 148 of the Atomic Energy Act. (See 10 CFR 1017.3.)

ACRONYMS

ANSI	American National Standards Institute
CDL	commercial drivers license
CFR	Code of Federal Regulations
CVSA	Commercial Vehicle Safety Alliance
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
FRA	Federal Railroad Administration
LLW	low-level waste
MERRTT	Modular Emergency Response Radiological Transportation Training
MLLW	mixed low-level waste
NRC	Nuclear Regulatory Commission
NWPAA	Nuclear Waste Policy Act, as Amended
RAP	Radiological Assistance Program
RCO	Regional Coordinating Office
SECOM	Secure Communications
STEP	State and Tribal Education Program
TEC/WG	Transportation External Coordination Working Group
TEPP	Transportation Emergency Preparedness Program
TRANSCOM	Transportation Tracking and Communications System
TRU	transuranic
WIPP	Waste Isolation Pilot Plant

**SUMMARY OF PRINTED PRODUCTS FROM THE DOE
NATIONAL TRANSPORTATION PROGRAM**
(see <http://www.ntp.doe.gov/>)

Booklets and Brochures

Transporting Radioactive Materials...Answers to Your Questions – This booklet, written in question and answer format, provides an overview of the transportation of radioactive materials for a general audience. Topics covered include radiation, transportation regulations, uses of radioactive materials, radioactive waste, routing, packaging and transport methods, and more.

Transportation of Radioactive Materials: Q&A about Incident Response – This pocket-sized booklet, in question and answer format, discusses topics of interest to emergency responders related to transporting radioactive materials. Subjects covered include radiation, transport regulations, guidelines for emergency response, instrument usage, and definitions.

Transporting Radioactive Materials Safely: Guide to DOE Transportation – This brochure summarizes DOE's various transportation programs and associated regulations, DOE points of contact, etc.

Fact Sheets

DOE Shipping Activity compares the number of nonhazardous, radioactive, and nonradioactive hazardous shipments made by DOE and their modes of shipment.

International Transportation of Radioactive Materials discusses international safety standards for transporting radioactive materials. In addition, it describes some of the worldwide uses of radioactive materials and summarizes DOE's involvement in international shipping.

Radioactive Materials Package Performance details types of packagings used in the transportation of radioactive materials, as well as Federal packaging test requirements and certification methods.

Radioactive Materials Shipping Regulations focuses on transportation regulations that apply to radioactive materials shipments. The fact sheet discusses packaging, marking, labeling, placarding, shipping papers, route selection, prior notification, training, and other issues.

Spent Nuclear Fuel and High-Level Radioactive Waste Transportation defines spent fuel and high-level waste and discusses regulatory requirements and safety precautions taken in their transport.

TRANSCOM: A Transportation Tracking and Communications System describes the TRANSCOM system and explains the types of information available to authorized users. The fact sheet also summarizes the number of shipments tracked by the system.

Transportation Quick Facts Series – This set of fact sheets contains basic information on a variety of transport packagings. The reverse side of each fact sheet contains a line drawing of the packaging being detailed on the front. The following *Quick Facts* are available: *BMI-1*, *Model-2000 Transport Package*, *GNS-16*, *IF-300*, *NAC-LWT*, *NLI-1/2*, *TN-8L*, and *TRUPACT-II*. New fact sheets will be developed as appropriate.

Transporting DOE Low-Level Radioactive Waste defines low-level waste and describes transport regulations.

General information on DOE's transportation activities may be obtained from—

National Transportation Program
U.S. Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque, NM 87185-5400

Web site: <http://www.ntp.doe.gov/>. Information on program-specific transportation activities is available through links found on this Web site. Consult the Web site for the current list of printed products.