

MANUAL

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RADIOACTIVE MATERIAL TRANSPORTATION PRACTICES MANUAL for Use with DOE O 460.2A



U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

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INITIATED BY:
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), including National Nuclear Security Administration (NNSA) organizations to use in planning and executing offsite shipments of radioactive materials including radioactive waste.
2. CANCELLATION. DOE M 460.2-1, *Radioactive Material Transportation Practices Manual for Use with DOE O 460.2A*, dated 9-23-02. Cancellation of a directive does not, by itself, modify or otherwise affect any contractual obligation to comply with the directive. Contractor requirement documents (CRDs) that have been incorporated into or attached to a contract remain in effect until the contract is modified to either eliminate requirements that are no longer applicable or substitute a new set of requirements.
3. APPLICABILITY.
 - a. DOE Elements. Except for the exclusions in paragraph 3c, this Manual applies to all Departmental elements responsible for transporting radioactive materials. Go to <http://www.directives.doe.gov/pdfs/reftools/org-list.pdf> for the current listing of Departmental elements. This list automatically includes all Departmental elements created after the Order is issued.

Consistent with the responsibilities identified in Executive Order 12344, the Deputy Administrator, Naval Reactors, will determine the applicability of this Manual for activities and facilities under his control. Transuranic waste shipments to the Waste Isolation Pilot Plant (WIPP) or a consolidated certification facility and national security shipments of spent nuclear fuel under the cognizance of the Naval Nuclear Propulsion Program (NNPP) will be made in accordance with this Manual.

The Administrator of the National Nuclear Security Administration (NNSA) will assure that NNSA employees and contractors meet their respective responsibilities under this Manual. Nothing in this Manual will be construed to interfere with the NNSA Administrator's authority under section 3212(d) of Public Law (P.L.) 106-65 to establish Administration specific policies, unless disapproved by the Secretary.

- b. DOE Contractors. Except for the exclusions in paragraph 3c, the CRD (Attachment 1) sets forth requirements for contractors who transport and/or offer radioactive materials/wastes for transport. The CRD will apply to the extent set forth in each contract.
 - c. Exclusions. Office of the Secretary, Office of the Chief Financial Officer, Office of the Chief Information Officer, Office of Congressional and Intergovernmental Affairs, Office of Economic Impact and Diversity, Office of Electricity Delivery and Energy Reliability, Office of Energy Efficiency and Renewable Energy,

Energy Information Administration, Office of Fossil Energy, Office of the General Counsel, Office of Hearings and Appeals, Office of Human Capital Management, Office of Intelligence and Counterintelligence, Office of Legacy Management, Office of Management, Office of Policy and International Affairs, Office of Public Affairs, Office of Inspector General, Bonneville Power Administration, Southeastern Power Administration, Southwestern Power Administration, Western Area Power Administration.

4. SUMMARY. This Manual is composed of 14 transportation practices that establish a standardized process and framework for interacting with State, Tribal, and local authorities, other Federal agencies, and transportation contractors and carriers regarding DOE radioactive material shipments. The practices described in this Manual have been divided by mode (truck or rail) and by material type [classified versus non-classified, spent nuclear fuel (SNF), transuranic (TRU) waste, low level 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. For other topics, different approaches are applied to different modes and materials. 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 2) and a list of acronyms (Attachment 3).

The practices in this Manual will be updated to cover programmatic changes and 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.

5. REFERENCES.

- a. Department of Transportation regulations in Title 49 of the Code of Federal Regulations (CFR);
- b. Nuclear Regulatory Commission regulations in Title 10 of the CFR;
- c. DOE O 460.1B, *Packaging and Transportation Safety*, dated 4-4-03;
- d. DOE O 460.2A, *Departmental Materials Transportation and Packaging Management*, dated 12-22-04; and
- e. DOE O 470.4A, *Safeguards and Security Program*, dated 5-25-07.

6. CONTACT. Questions concerning this Manual should be addressed to the Office of Transportation, EM-63, 301-903-7284.

BY ORDER OF THE SECRETARY OF ENERGY:



JEFFREY F. KUPFER
Acting Deputy Secretary

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1. CONTRACTOR REQUIREMENTS DOCUMENT
2. GLOSSARY
3. ACRONYMS
4. SUMMARY OF RESOURCES

1.0 TRANSPORTATION PRACTICES

1.1 Introduction

This Manual establishes a set of standard transportation practices for U.S. Department of Energy (DOE) organizations to use in planning and executing offsite shipments of radioactive materials including radioactive waste. 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 organizations are responsible for implementing this Manual, as well as applicable agreements with State, Tribal, or local authorities. DOE is committed to meeting or exceeding all Nuclear Regulatory Commission (NRC) or Department of Transportation (DOT) requirements that apply to comparable commercial shipments and, therefore, all Federal and contractor entities subject to this Manual must act in accordance with this policy by performing transportation activities in a manner that meets or exceeds any such requirements, except as otherwise specified by this Manual. The Contractor Requirements Document in Attachment 1 of this Manual also specifies particular requirements that contractors must follow if this Manual is incorporated into their contract. The practices in this Manual 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 that effort were reflected in the original issue of this Manual. This update reflects the ongoing and continuing collaboration of DOE organizations and outside organizations on transportation of radioactive material and waste.

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 transports various types of radioactive materials. These include isotopes for medical, industrial, and research purposes; weapons-related materials; spent nuclear fuel (SNF) and high-level waste (HLW); low-level waste (LLW) and mixed low-level waste (MLLW); transuranic (TRU) waste; and tritium-bearing reactor components.

DOE Headquarters organizations provide policy direction and oversight for packaging and transportation activities for their respective offices. The DOE Headquarters organizations responsible for shipments are the Offices of Environmental Management; Nuclear Energy, Science and Technology; Civilian Radioactive Waste Management (OCRWM); and within National Nuclear Security Administration (NNSA), Defense Programs; Defense Nuclear Nonproliferation; and the Naval Nuclear Propulsion Program (NNPP). For most radioactive shipments, DOE field organizations are responsible for detailed planning and for ensuring that shipments are conducted in accordance with all applicable requirements and standards. The field organizations also serve as the primary points of contact for public and stakeholder interactions.

1.3 Requirements

DOE works with DOT and NRC in developing requirements and standards for radioactive material transportation. DOT and NRC have the primary responsibility for Federal regulations governing commercial radioactive material transportation. DOE has broad authority under the Atomic Energy Act of 1954, as amended (AEA), to regulate all aspects of activities involving radioactive materials that are undertaken by DOE or on its behalf, including the transportation of radioactive materials. DOE exercises this authority to regulate certain DOE shipments, such as shipments undertaken by governmental employees or shipments involving special circumstances.

In most cases that do not involve national security, DOE utilizes commercial carriers that undertake DOE shipments under the same terms and conditions as commercial shipments. These shipments are subject to regulation by DOT, NRC and other entities as appropriate. As a matter of policy, however, all DOE shipments will be undertaken in accordance with the requirements and standards that apply to comparable commercial shipments, except where there is a determination that national security or another critical interest requires different action. This policy is set forth in DOE Orders 460.1B, *Packaging and Transportation Safety*, 460.2A, *Departmental Materials Transportation and Packaging Management*, and 470.4A, *Safeguards and Security Program*. In implementing this policy, DOE will cooperate with Federal, State, local and Tribal entities and utilize existing expertise and resources to the extent practicable. In all cases, DOE will achieve a level of protection that meets or exceeds the level of protection associated with comparable commercial shipments.

1.4 Shipments Covered by this Manual

This Manual covers the majority of DOE off-site radioactive material shipments but not all materials and modes. The practices apply to the DOE radioactive material/waste shipments that represent the greatest percentage of radioactivity placed in the nation's transportation system by DOE. 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 NNPP and highway shipments of classified materials made by OST. Truck shipments of TRU waste are also covered.

The Carlsbad Field Office (CBFO) has reached agreement with the 30 states and 10 tribes from which or through which it ships TRU waste. These shipping protocols are institutionalized in five documents, as follows:

- Memorandum of Agreement between the Southern States Energy Board and the Department of Energy. Signed by the Southern State Energy Board Chairman and Secretary of Energy.
- Memorandum of Agreement between the Western Governors' Association and the Department of Energy. Signed by the Chairman of the Western Governors' Association and the Secretary of Energy.
- Regional Protocol for the Safe Transport of Transuranic Waste to the Waste Isolation Pilot Plant. (Southern States Energy Board)
- Waste Isolation Pilot Plant Transportation Safety Program Implementation Guide. (Western Governors' Association)
- Waste Isolation Pilot Plant Transportation Plan.

The last three of these are considered living documents and are changed from time-to-time by mutual agreement. They are detailed documents for the sections covered by this manual which apply to the TRU waste shipments.

All shipments to a repository under the Nuclear Waste Policy Act of 1982 (NWPA), as amended, are covered by this Manual. Shipments of commercial SNF, DOE SNF, commercial HLW and defense HLW to a repository at Yucca Mountain, Nevada are the responsibility of OCRWM. Prior to NWPA shipments of HLW and SNF, OCRWM will develop detailed operational plans in collaboration with OCRWM stakeholders. Although this Manual covers NWPA shipments, it does so without any detailed specificity since the operational plans have yet to be developed. When the detailed plans are developed, the Manual will be amended to reflect the commitments made in the plans. Shipments of Naval spent fuel are the responsibility of the NNPP.

This Manual does not apply to a number of unique items:

- shipments by barge or water vessel;
- air shipments of medical and research isotopes which are lightweight and handled by commercial air express service to ensure quick delivery because of their short half-lives;
- depleted uranium hexafluoride cylinders;
- large-quantity sources;
- classified materials moving by commercial carriers;
- fresh (new) nuclear fuel;
- non-hazardous materials;
- non-radioactive hazardous materials; and

- onsite transfers of radioactive material.

All of these shipments, however, are subject to applicable requirements and standards.

2.0 TRANSPORTATION PLANNING

2.1 Introduction

Transportation planning activities include characterization and classification of the material to be shipped, identification of programmatic needs and applicable requirements, selection and procurement of appropriate packaging, 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 will be provided through outreach activities conducted by the DOE organizations responsible for the materials to be transported. Each of these planning elements is addressed below.

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, and site advisory boards.

2.2. 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 accordance with applicable regulations and that the material is compatible with the packaging selected for shipment. 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.

Characterization and classification responsibilities for shipments to a repository under the NWPA are set forth in the Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste (10 CFR 961) for commercial sources of material and in MOUs between OCRWM and other DOE programs for DOE material.

2.3 Identification of Programmatic Needs and Applicable Requirements

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

2.4 Packaging Selection

Packaging selection depends on the DOT material classification and the chemical and physical characteristics of the material. Packaging requirements may also be specified by statute. The Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act and the NWPA both contain packaging certification requirements for WIPP and SNF/HLW repository shipments, respectively. The cognizant DOE organization 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 that has been properly trained on DOT, NRC and/or international packaging regulations.

For repository shipments of SNF and HLW, Section 180(a) of the NWPA requires that OCRWM only use packages that have been certified by the NRC for such purposes.

2.5 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, under certain circumstances where only a particular mode of transportation or a particular carrier within that mode can 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;
- record of past performance of the carrier; and
- review of the carrier's security measures and verification of the carrier's employee hiring and review process, including background checks and ongoing security training program.

2.5.1 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 SNF and HLW 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 organizations will consider these DOT study conclusions when selecting modes and will consult with appropriate State and Tribal officials to ensure their concerns are considered.

2.5.2 OCRWM SNF and HLW shipments to a repository at Yucca Mountain, Nevada. The primary shipping mode will be by rail and use of special rail service (specifically dedicated trains) is anticipated for most shipments.

2.6 Transportation Plans

2.6.1 Non-Classified Spent Nuclear Fuel, High-Level Waste, Tritium-Bearing Reactor Components, and Transuranic Waste Shipments.

The cognizant DOE organization will consult with State, Tribal, and carrier representatives when developing plans and will provide them, for comment, to those States and Tribes through whose jurisdictions the shipments are expected to be transported. Transuranic waste shipments will follow the WIPP Transportation Plan (DOE/CBFO 98-3103). If the carrier transportation plans are incorporated into the DOE plans as an appendix, States and Tribes will have an opportunity to review and comment on the plans.

Transportation plans describe operational strategy and delineate steps that will be taken in accordance with applicable 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 (as appropriate, DOE organizations consider input from States and Tribes on holidays or special events that may impact shipping schedules),
- estimated number of shipments,

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

- mode of transport and carriers to be used,
- packages to be used,
- preferred and/or alternative routes,
- shipment pre-notifications,
- safe parking arrangements,
- tracking systems,
- emergency preparedness and response,
- recovery and cleanup,
- security arrangements, and
- public information.

2.6.2 Low-Level Waste, Mixed Low-Level Waste, and Other Radioactive Material.

Transportation plans are not routinely written for shipments of these materials. The cognizant DOE program organization will determine if the shipping activities warrant the development of a written transportation plan. When a transportation plan is not developed, the DOE shipping organization may develop, in consultation with State and Tribal authorities, a detailed fact sheet to provide specific shipment information for a wide audience: public officials, media, state and local emergency response personnel, state and regional planners, etc.

2.7 **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 4. 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. The cognizant DOE program organization is responsible for coordinating stakeholder interactions.

2.7.1. Non-Classified Spent Nuclear Fuel, High-Level Waste, Transuranic Waste Shipments, and Tritium-Bearing Reactor Components. If the cognizant DOE organization

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 will 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. The cognizant DOE program organization will coordinate the draft information materials, where appropriate, with the affected State and Tribal agencies. 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.

As indicated in OCRWM's Strategic Plan for the Safe Transportation of Spent Nuclear Fuel and High-Level Radioactive Waste to Yucca Mountain (November 18, 2003), OCRWM will develop and implement a communications plan with States, Tribes, local governments, industry and other parties participating in transportation planning. Interested parties will be asked to provide comments on a draft of the OCRWM Communications Plan.

- 2.7.2 Other Non-Classified Shipments Of Low-Level Waste, Mixed Low-Level Waste, And Other Radioactive Materials. In many instances, the general information available on programmatic web sites (see Attachment 4) may be sufficient. For some unique shipping activities, more detailed communications planning may be desired. The responsible DOE organization will decide whether to develop a communications plan.
- 2.7.3 Classified National Security Shipments. All inquiries regarding classified national security shipments should be directed to OST in Albuquerque, New Mexico.

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

3.0 EMERGENCY PLANNING

3.1 Introduction

This section addresses DOE emergency planning activities with State and Tribal jurisdictions for the transportation of DOE radioactive material/wastes. 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 in preparing for response to a transportation incident involving DOE shipments of radioactive material. TEPP provides technical assistance to State and Tribal governments in obtaining a greater understanding of radiological risks, identifying planning deficiencies, updating plans, training first responders, and stimulating and testing the system for strengths and needed improvements through drills and exercises. 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. 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

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.

DOE emergency planning will be consistent with the National Incident Management System, the National Response Plan and other current federal emergency response programs.

A TEPP coordinator has been designated for each of the eight regional coordinating offices to serve as the interface with State and Tribal organizations for emergency planning for DOE transportation of radioactive material/wastes (see Figure 1). A current listing of TEPP coordinator names and phone numbers along with additional information on TEPP is available online at www.em.doe.gov/otem.

3.2.1 The regional TEPP coordinator will—

- Discuss emergency response roles, responsibilities, capabilities, notification procedures, and information needs with State and Tribal governments along transportation corridors used for DOE radioactive material/waste 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 radioactive material and performing needs assessments.
- Coordinate with site transportation programs to identify planned 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).

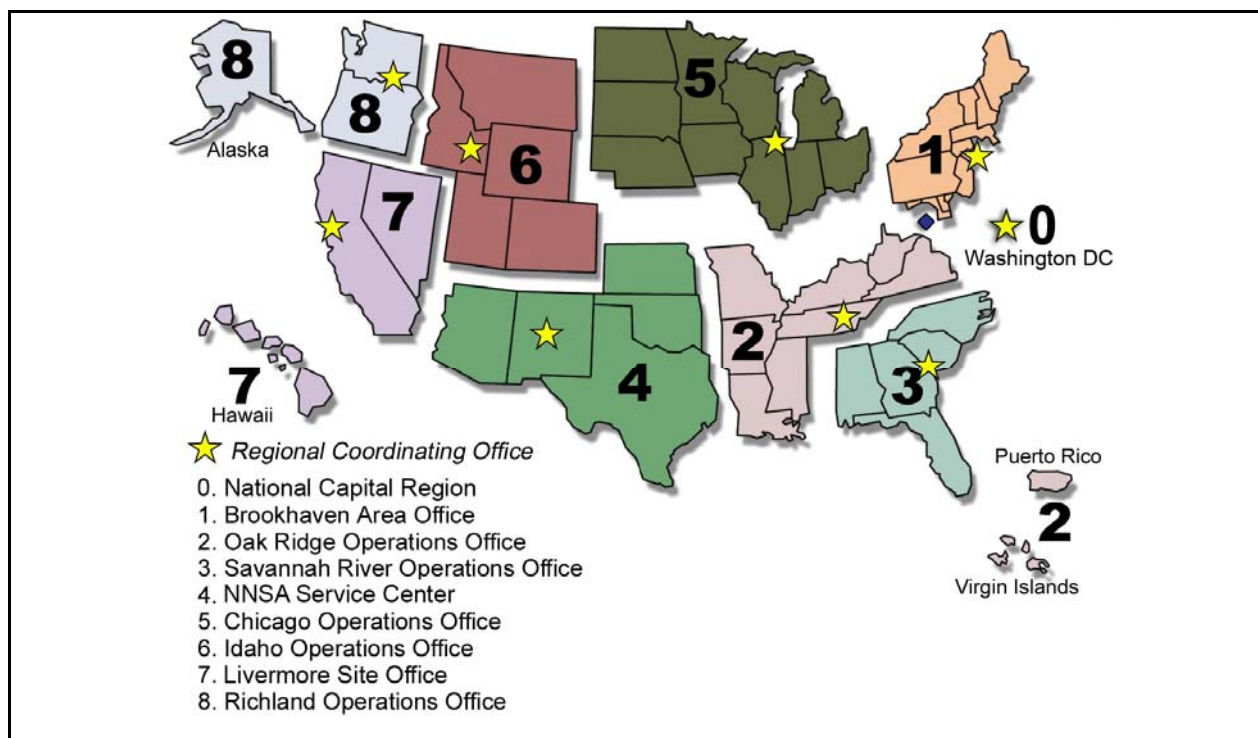


Figure 1 DOE Radiological Assistance Program Regions

3.2.3 Program-specific planning activities include the following.

- a. The OST Emergency Management Plan documents the emergency planning process for any type of operational emergency involving OST personnel and vehicles.
- b. OCRWM 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 are consistent with the plan and clearly define actions to be taken in the event of any emergency. States and Tribes will have an opportunity to comment on the plans.

3.3 Training

3.3.1 Transportation Emergency Preparedness Program.

TEPP developed the Modular Emergency Response Radiological Transportation Training (MERRTT) to address concerns from States, Tribes, and local jurisdictions about shipments of radioactive material by the U.S. Department of Energy. MERRTT provides fundamental knowledge for responding to transportation incidents involving radioactive material and builds on training in existing hazardous materials curricula. MERRTT satisfies the training requirements outlined in the WIPP Land Withdrawal Act, and is used to train responders along the WIPP corridor. The training includes a module on the OST shipments and is largely applicable to Naval spent fuel rail shipments.

MERRTT has a modular design, consisting of 18 concise, easy to understand modules and 4 hands-on practical exercises. This design allows a jurisdiction to integrate the modules into existing hazardous material training programs. The modular format allows instructors to tailor the training to specific emergency response audiences.

MERRTT is designed to provide instructor-led or self-paced instruction. The training objectives and sequence of the modules have been structured to align the modules with the hazardous material training competencies outlined in OSHA 29 CFR 1910.120(q) and the National Fire Protection Association standards.

3.3.2 Program-specific training activities include the following:

- a. Office of Secure Transportation conducts drills and exercises regularly. In-service tests are conducted annually with DOE response elements and with State law enforcement and response agencies. The OST invites States to participate in its annual in-service training security and emergency response joint training exercises.
- b. WIPP uses the TEPP/MERRTT to train responders along the WIPP corridors. In addition, WIPP uses the State, Tribal Education Program for training in matters

such as National Incident Management System, etc., and conducts training exercises along WIPP corridors.

- c. Office of Civilian Radioactive Waste Management. Section 180(c) of the NWPA provides for technical and financial assistance for training of local public safety officials to States and Tribes through whose jurisdictions DOE plans to transport SNF or HLW to the proposed Yucca Mountain repository. The training is to cover both safe routine transportation and emergency response procedures. A detailed discussion of the 180(c) training grant program can be found in DOE's proposed policy published in the Federal Register on July 23, 2007 at 72 FR 40139-01. DOE intends to revise and finalize the policy for issuing 180(c) training grants prior to the commencement of shipments.
- d. 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.

4.0 PROJECTED SHIPMENT PLANNING INFORMATION

4.1 Introduction

This section addresses the provision of information regarding projected shipments of DOE radioactive materials/wastes. The information to be provided and the timing of it will be determined by the responsible DOE organization to permit each Headquarters organization to determine, in concert with 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. The cognizant DOE organization, field office and shippers will establish an ongoing dialogue, consistent with security considerations, with State and Tribal agencies that demonstrate an interest in shipments traveling through their jurisdictions.

4.2.1 Non-Classified Shipments

- a. General information will be provided for shipment of—
 - spent nuclear fuel;
 - high-level waste;
 - high-volume shipments of LLW and MLLW;²
 - TRU waste; and
 - tritium-bearing reactor components.
- b. General information may include the following³ (as determined by the responsible DOE organization, in consultation with State and Tribal authorities):
 - when shipments are anticipated;
 - origin;
 - destination;
 - projected pass-through State and Tribal lands;

² For the purposes of this Manual, 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.

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

- 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); and
 - emergency response guidance.
- 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 organization, 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 organization 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 organization will determine the most appropriate method for providing and updating the information.
 - (2) DOE programs may use the Prospective Shipments Module for SNF, highway route-controlled quantity, and other campaigns, after the NEPA process is completed.

4.2.2 Classified National Security Shipments

- a. General information on both highway shipments of classified materials made by the OST and on Naval spent fuel shipments are discussed with State and Tribal officials.

- b. DOE works with contacts, designated by States and Tribes, with need for information about classified national security shipments.

5.0 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 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 highway route-controlled quantity shipments.
- (2) DOE organizations (along with the operating contractors) analyze proposed routes using transportation models such as the Transportation Routing Analysis Geographic Information System (TRAGIS).
- (3) States and Tribes may designate highway routes in accordance with the regulations set forth in 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 shipments subject to an NRC license (e.g., 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) For shipments not subject to an NRC license, DOE will be responsible for stakeholder interactions, final route approval, and other applicable safeguards and security requirements. DOE will meet or exceed the requirements prescribed by DOT and NRC for comparable commercial transportation.

b. Transuranic Waste Shipments

DOE Carlsbad Field Office 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 CBFO —

- 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, Tribal, and local review and comment on proposed routes;
- recognizes that States and Tribes may designate routes in accordance with 49 CFR 397.103;
- uses cooperative agreements with State Regional Groups to help facilitate interactions with States;
- allows for route modifications following a defined process involving State, Tribes, and local stakeholder input;
- minimizes the number of routes used for WIPP shipments; and
- specifies routes to be used as an enforceable provision in contracts with carriers.

If shipments are contemplated using protocols other than those agreed to for TRU waste shipments to WIPP, negotiations will be held with affected states and tribes prior to the commencement of shipments.

- c. Low-Level and Mixed Low-Level Waste. Carriers select routes in accordance with the provisions of 49 CFR 397.101(a), which state that except in circumstances when there is only one practicable highway route available, considering operating necessity and safety, the carrier:
- (1) ensures that the motor vehicle is operated on routes that minimize radiological risk;
 - (2) considers 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) tells the driver which route to take and that the motor vehicle contains Class 7 (radioactive) materials.
- d. Isotopes. The carriers act in accordance with the requirements set forth in 49 CFR 397.101.

5.2.2 Classified National Security Shipments

The provisions of 49 CFR 173.7(b) exempt national security shipments from the requirements set forth in 49 CFR 171 through 189. However, to the extent consistent with national security, 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, High-Level Waste, and Tritium-Bearing Reactor Components

- (1) The cognizant DOE organization will consult with and develop routing options with rail carriers and with States and Tribes. 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 organizations or operating contractors analyze proposed routes using transportation models (such as TRAGIS).
- (3) Cognizant DOE organizations consult 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) For shipments subject to an NRC license (e.g., 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) For shipments not subject to an NRC license, DOE will be responsible for stakeholder interactions, final route approval, and

other applicable safeguards and security requirements. DOE will meet or exceed the requirements prescribed by DOT and NRC for comparable commercial transportation.

b. Transuranic Waste Shipments

No rail shipments of TRU waste are currently planned. The protocol for rail shipments to WIPP will be developed if a decision is made to utilize rail. If shipments are contemplated using protocols other than those agreed to for TRU waste shipments to WIPP negotiations will be held with affected states and tribes prior to the commencement of 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 contacts as described in the Projected Shipment Planning Information section.

6.0 SECURITY

6.1 Introduction

This section generally addresses safeguards and security actions taken to protect DOE shipments of radioactive materials. Sensitive information regarding specific commodities or shipments is not discussed here.

Security and safety are the key considerations in transportation of radioactive materials. For decades, NRC, DOE, and DOT regulations and well-established industry best practices have specified detailed requirements for appropriate protection and security, which generally vary depending on the type and amount of material involved.

Following the terrorist attacks of September 11, 2001, and the subsequent global war on terror, officials at every level of government have reexamined established practices related to physical protection of all hazardous materials shipments, including radioactive material. NRC, DOT, and individual DOE organizations have established enhanced security requirements for radioactive material/waste shipments. These efforts are consistent with current international initiatives and Department of Homeland Security (DHS) activities to prevent not only threats to public safety from malicious acts (such as sabotage or diversion of material), but also inadvertent loss of control of radioactive material. Early in the shipment planning process, the responsible DOE organization will identify the security requirements applicable to the shipment.

Information dealing with the security of many radioactive shipments in transit can be sensitive. This information may require protection as safeguards information under NRC regulations or as Unclassified Controlled Nuclear Information (UCNI) or Official Use Only (OUO) under DOE regulations. Shipments of strategic materials such as highly enriched uranium are safeguarded as classified information. Unauthorized disclosure of any of the above levels of information is a violation of the Atomic Energy Act and other legal authorities.

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 cognizant DOE organizations and evaluated on an ongoing basis in coordination with Federal, State, Tribal, and carrier law enforcement/security organizations. These threat assessments assist in determining appropriate security for shipments. In addition, in certain situations, the requirements in 49 CFR 172.800 provide for development of a security plan to ensure —

- sufficient background to understand the nature of the threats against hazardous materials transportation;
- the means to identify the vulnerabilities to those threats; and
- an approach to address the vulnerabilities.

The plan will include an assessment of possible transportation security risks for shipments of hazardous material covered under this regulatory citation.

DOE program organizations may develop additional guidance for shipments in transit in the event the DHS Threat Advisory Level is elevated (e.g., when DHS elevates the threat level from Yellow to Orange).

6.2 Non-Classified Shipments

6.2.1 Spent Nuclear Fuel and High-Level Waste

- a. Security will be provided in compliance with NRC requirements in 10 CFR Part 73 for shipments subject to an NRC license. Other DOE shipments will be undertaken in a manner that meets or exceeds NRC security requirements. NRC has issued compensatory measures to enhance security for irradiated reactor fuel and special nuclear material of moderate and low strategic significance, as described in 10 CFR 73.37 and 10 CFR 73.67. DOE organizations will ensure that in-transit requirements are addressed, including developing security plans, implementing information and physical security access controls, training, escorts, inspections, tracking, communications, and employee background checks. Specific NRC requirements are considered Safeguards Information; DOE requirements may be handled as OUO or other protected categories of information.
- b. Liaison with Federal, State, and Tribal law enforcement/security officials will be provided by the DOE program organization.
- c. During transit, the shipment will be under constant surveillance by the drivers or escorts.
- d. Escorts may be provided by State, Tribal, or local jurisdictions, at their discretion.
- e. Transportation Tracking and Communications System (TRANSCOM) or the OCRWM equivalent system will be used to track shipments, as described in the Tracking Protocol.
- f. In addition to the above, the following practices apply to Foreign Research Reactor Fuel shipments:
 - (1) 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.
 - (2) Overland transport security is coordinated with State and Tribal law enforcement officials and the involved railroad and motor carriers.

6.2.2 Low-Level Waste, Mixed Low-Level Waste, Isotopes

- a. DOE organizations must ensure the development and implementation of a security plan if such a plan would be required for commercial shipments under 49 CFR 172.800. The security plan will include an assessment of possible transportation security risks and appropriate measures to address the assessed risks. Specific measures put in place by the plan may vary based on the level of threat at a given time. The security plan, together with the carrier's security plan, will include, at a minimum—
 - (1) personnel security;
 - (2) unauthorized access to the hazardous material;
 - (3) en route security from origin to destination.

6.2.3 Transuranic Waste Shipments:

- 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 by CBFO regarding security concerns as may be identified.
- e. If shipments are contemplated using protocols other than those agreed to for TRU waste shipments to WIPP negotiations will be held with affected States and Tribes prior to the commencement of shipments.

6.2.4 Tritium-Bearing Reactor Components

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

6.3 Classified National Security Shipments

6.3.1 Office of Secure Transportation Shipments must:

- a. Be accompanied by armed Federal agents trained to protect and defend shipments from any attack or following any accident;
- b. Use trailers to transport nuclear weapons that are specially designed vehicles that incorporate safeguards to prevent unauthorized removal of the cargo;
- c. Use the OST Transportation Emergency Communications Center (TECC) to monitor, track, and provide communication with every convoy on the road; and
- d. Brief state law enforcement officials through the OST State Liaison Program.

6.3.2 Naval Spent Fuel Shipments

- a. Shipments must be escorted full-time by armed, specially trained (communications, firearms, tactics, observation, use of deadly force) active duty Navy personnel who maintain 24-hour surveillance.
- b. Close liaison must be maintained with rail carrier police departments who coordinate with State and local law enforcement officials as necessary. Rail carrier police departments must be provided advance information for each shipment.
- c. OST TECC must monitor, track, and provide communication with every shipment as described in the Tracking section.
- d. State law enforcement officials must be briefed through the OST State Liaison Program.

7.0 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). Although DOE has processes and programs in place to monitor carrier performance and safety, it is ultimately the responsibility of the carrier to follow applicable regulations.

7.2 Non-Classified Shipments

DOT provides regulatory oversight of commercial carriers. Carriers used to transport highway route controlled quantities (HRCQ) of radioactive material in less-than-truckload (LTL) or truckload (TL) quantities, any TL quantities of radioactive material, and any TL quantities of hazardous waste, must be evaluated in accordance with the DOE "Motor Carrier Evaluation Program Plan and Program Procedures."

DOE organizations will ensure that drivers hold a current commercial driver's license (CDL) with a hazardous material endorsement and 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.

7.2.1 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. DOE will use highly qualified drivers and high quality equipment. 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.

7.2.2 Spent Nuclear Fuel Shipped Under the NWSA. 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 or current OCRWM equivalent tracking system 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 as described in 10 CFR 19.12(b).

7.2.3 Transuranic Waste Shipments

- a. The CBFO will ensure compliance with the WIPP transportation plan, which includes specific requirements for driver qualifications, driver performance requirements, driver training, carrier requirements, inspection requirements, and vehicle maintenance requirements.

- b. If shipments are contemplated using protocols other than those agreed to for TRU waste shipments to WIPP negotiations will be held with affected states and tribes prior to the commencement of shipments.

7.2.4 Low-Level and Mixed Low-Level Waste. LLW and MLLW shipments are made in accordance with the applicable requirements set forth in 49 CFR based on the type and level of hazard associated with the material.

7.2.5 Isotopes. Isotope shipments are made in accordance with applicable requirements set forth in 49 CFR.

7.3 Classified National Security Shipments

Drivers will be at least 21 years of age and hold a current CDL with hazardous material endorsement. Drivers will meet applicable requirements in 49 CFR and are also required to pass an annual recertification with a check ride. They will receive extensive driver training (3-week tractor/trailer driving class, off-road driving course, defensive driving courses) and follow the requirements of the DOT safety regulations. Drivers are covered by the Human Reliability Program. This program requires that training, security, and medical requirements are completed and verified annually by the Human Reliability Program administrator and certified by the Manager of OST. Also, drivers will be required to 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.

7.4 Rail Carrier Requirements

Rail carriers follow the Federal Railroad Administration (FRA) regulations and 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. Rail shipments will meet the applicable Association of American Railroads (AAR) standards and recommended practices.

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 conformity 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 carrier business arrangements, and provide another measure of assurance that regulatory requirements are met.

For NWPA shipments of SNF and HLW, 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 or the OCRWM equivalent system. Crews will also be trained for hazardous material handling in accordance with individual railroad operating rules and AAR standards.

8.0 SHIPMENT PRENOTIFICATION

8.1 Introduction

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

8.2.1 Spent Nuclear Fuel and High-Level Waste. DOE or its contractors will provide advance notification of non-classified shipments of SNF and HLW in accordance with applicable requirements as shown in Table 1. DOE will strive to ensure that affected jurisdictions are provided with general knowledge several weeks in advance of upcoming shipments. Section 180(b) of the NWSA requires OCRWM to abide by NRC regulations regarding advance notification of State and local governments prior to transportation of SNF or HLW to a NWSA-authorized facility.

8.2.2 Transuranic Waste Shipments. The CBFO provides notifications to corridor States and Tribes affected by TRU waste shipments.

- a. An annual projection of shipments by January 31.
- b. A six-month update of the annual projection by July 31.
- c. 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:
 - name, address, and telephone number of the shipper, carrier, and receiver;
 - point of origin of the shipment;
 - description of the shipment;
 - estimated date and time of departure from the point of origin.
- d. Eight-week rolling projections are—
 - (1) provided by CBFO using electronic means and
 - (2) updated when the schedule changes.
- e. Two hours prior to entry into each State and Tribal jurisdiction, notifications are provided by telephone from the WIPP Central Monitoring Room to designated State control center.

- f. If shipments are contemplated using protocols other than those agreed to for TRU waste shipments to WIPP negotiations will be held with affected states and tribes prior to the commencement of shipments.

8.2.3 Other DOE Shipments. No shipment-specific notifications, unless explicitly required, will be provided for shipments of—

- c. LLW and MLLW,
- d. isotopes, and
- e. tritium-bearing reactor components.

8.2.4 Additional Shipment Information Practices. DOE organizations may provide additional planning information and shipment pre-notification to State, Tribal, and local authorities.

8.3 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).

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

Type of Shipment	Non-Classified DOE SNF and HLW shipments not subject to NRC license	SNF shipments subject to NRC license, in excess of 100 g net weight and over 100 rems per hour at 3 feet	SNF shipments subject to NRC license, less than 100 g net weight or under 100 rems per hour at 3 feet and HLW subject to NRC regulation
Requirements	DOE M 460.2-1A	10 CFR 73.37	10 CFR 71.97
Who is notified	Governors or designees and designated Tribal points of contact	Governors or designees	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

9.0 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 Highway Contingencies

9.2.1 Non-Classified Shipments

- a. Spent Nuclear Fuel, High-Level Waste, Tritium-Bearing Reactor Components, and Transuranic Waste Shipments. Before dispatch, the shipper and the carrier will agree that travel conditions are considered to be acceptable. Current weather conditions, weather forecasts, and projected road conditions at the point of origin and along the entire route will be considered before dispatching a shipment. The shipper and the carrier will consider any information provided by States or Tribes regarding weather and road conditions.

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 National Weather Service warnings of impending:

- winter storm,
- heavy snow,
- blizzard,
- blowing and drifting snow,
- freezing rain/drizzle,
- sleet or ice storm,
- dense fog advisory,
- tornado,
- severe thunderstorm,
- flash flood,

- tropical storm,
- high-wind,
- hurricane, and
- river flood.

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, or the OCRWM equivalent system. 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 or the OCRWM equivalent system.

- 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 OST Communications Center, TECC. 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 Rail Contingencies

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. 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.

10.0 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 is monitored along the transportation route.

10.2 Highway and Rail Modes

10.2.1 Non-Classified Shipments

- a. Spent Nuclear Fuel, High-Level Waste, Tritium-Bearing Reactor Components, and Transuranic Waste Shipments. 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 or a current OCRWM shipment tracking system with comparable or enhanced capabilities. The TRANSCOM or current equivalent OCRWM shipment tracking system users' manual will discuss backup procedures to be used in the event of operational problems with the system. The shipment tracking system access is limited to users authorized by the cognizant DOE organization and in coordination with the CBFO or OCRWM, as applicable. Access to information on a particular shipment is controlled by the cognizant DOE organization to provide timely information to eligible corridor States and Tribes.

For SNF shipments covered by the NRC, user designation and access to the tracking system 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 or the current equivalent OCRWM shipment tracking system will give information on the emergency to contacts described in the Emergency Notification protocol.

If shipments are contemplated using protocols other than those agreed to for TRU waste shipments to WIPP negotiations will be held with affected states and tribes prior to the commencement of shipments.

- b. Low-Level Waste, Mixed Low-Level Waste and Isotopes are not subject to DOE tracking systems. 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 OST maintains 24-hour-a-day tracking and monitoring through TECC. 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.

11.0 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 Highway Inspections

11.2.1 Non-Classified Shipments

- a. Spent Nuclear Fuel , High-Level Waste, Tritium-Bearing Reactor Components, and Transuranic Waste. The shipper and/or carrier will perform preshipment inspections to ensure conformity with regulatory standards. Prior to departure, shipments will also be made available for inspection by CVSA-certified State inspectors unless other arrangements have been made with the State. As required by DOT, inspections will be conducted in accordance with the CVSA⁴ Enhanced (Level VI) North American Standard Inspection Procedures. 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 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; however, not all en-route states would likely inspect every shipment.

Post-shipment inspections will be conducted by the receiver, and by States and Tribes at their discretion (but not to impact unloading operations), in accordance with applicable regulations. Any post-shipment inspection that reveals a regulatory non-conformity 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 conformity with regulatory standards. Inspections may be done at the discretion of the States and Tribes, in accordance with CVSA North American Standard Inspection (Level I) criteria, or in accordance with individual State requirements.

⁴ 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.

11.2.2 Classified National Security Shipments

DOE's fleet of vehicles, operated by the OST, transports classified shipments. All OST vehicles are required to undergo a complete maintenance inspection prior to transporting national security shipments. The vehicle safety inspection standards used by the OST meet or exceed those contained in the CVSA Level VI inspection. The provisions of 49 CFR 173.7(b) exclude national security shipments from coverage by requirements set forth in 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 OST voluntarily follows those requirements that are compatible with security and technical requirements.

11.3 **Classified and Non-Classified Rail Inspections**

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 conformity with applicable Federal and State regulations, AAR rules, and industry standards. 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 conformity 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 conformity with applicable Hazardous Materials Regulations concerning placarding, shipping papers, crew notification, train placement, and securement requirements. 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. A shipment cannot proceed if it does not meet applicable requirements.

Inspections may be performed en route at suitable, scheduled stopping locations (e.g., rail yards, crew change points, refueling locations) by the FRA and State agencies through the FRA State participation program. Tribes may also participate in inspections through the State participation program, by agreement with the affected State.

The receiver will conduct post-shipment inspections in accordance with applicable regulations. The receiving state may conduct an inspection at the receiving site. Any post-shipment inspection that reveals a regulatory non-conformity 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

No rail shipments of TRU Waste are currently planned. If shipments are contemplated using protocols other than those agreed to for TRU waste shipments to WIPP

negotiations will be held with affected states and tribes prior to the commencement of shipments.

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.

12.0 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. State, Tribal, and local law enforcement personnel have the authority to direct shipments to specific parking areas.

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. Safe parking areas will be selected prior to the initiation of the shipment in consultation with the States and Tribes through which the shipments pass. 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 or alternate tracking system.

WIPP shipping protocols provide detailed agreements between the CBFO and states and tribes on graduated approach to safe parking, listing the most favorable locations and locations to be avoided when seeking safe parking.

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,
- required security (e.g., lighting), and
- 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—

- heavily 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.

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

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 the requirements of the DOT safety 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.

c. Isotopes

Safe parking locations will be determined by the carrier following normal operating practices, including the applicable requirements set forth in 49 CFR.

12.2.2 Classified National Security Shipments

The OST has in effect a safe havens agreement with the Department of Defense (DoD) and 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 OST will notify a State for assistance in locating safe parking if DOE and DoD facilities are unavailable; however, the OST 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 railcars. 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.

13.0 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 Emergency 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 are closed or facilities are 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. For example, an event that does not meet any of the above criteria but might generate an unusual level of public and/or media attention would typically warrant notification. 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; or
- 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:

- designated State and/or Tribal 24-hour points of contact (where the event occurs);
- the cognizant DOE Radiological Assistance Program Regional Response Coordinator (RRC), which may notify additional State/Tribal contacts within their respective regions (e.g., adjacent States and Tribes); and
- appropriate DOE organizations, including the DOE receiving site and the DOE Headquarters Watch Office.

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

13.3.3 For TRU waste shipments, in addition to the notifications identified in Section 13.3.2, 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 OCRWM shipments, OCRWM will notify the NRC. These notifications will be in addition to the notifications identified in Section 13.3.2.

13.3.5 The DOE Headquarters Watch Office will notify DOE field offices and Headquarters organizations 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 the notification process, the type of information to be provided as it becomes available should include:

- identity of the caller and call-back telephone number;
- location, date, and time of the event;
- 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;
- 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 may access the list of points of contact through the Internet (www.em.doe.gov/otem/program.html). The database is reviewed twice a year and the DOE Regional TEPP Coordinators must provide interim changes throughout the year.

For OST classified shipments, the OST 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 OST TECC control center.

13.6 Non-Emergency Events

In addition to emergency notifications discussed in this section, specific DOE organizations, 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.

14.0 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 DOE Assistance

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. The establishment of the incident command system will be in accordance with the plan, protocols, and procedures of the State, Tribe, or local jurisdiction and in accordance with the National Incident Management System. If the incident involves an OST classified shipment, the OST will establish a unified command to work closely with State/local incident command.

14.3 Emergency Response

14.3.1 When an emergency occurs, the cognizant DOE organization or shipper will:

- a. Make emergency notifications 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 centers, 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; and
- 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 RRC. 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 RRC 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 Incident Commander.
 - (3) For TRU Waste shipments, the shipper may call upon the Incident/Accident Response Team, which will—
 - (a) provide technical expertise in determining the status of the packages 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 (cognizant program office and the Office of Emergency Response within NNSA), the cognizant DOE field office, and the cognizant RRC in the affected region to designate a Federal On-scene Coordinator/Commander and/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 Nuclear/Radiological Incident Annex (radiological response), the National Response Plan.
- 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. Determine if a DOE Public Information Officer (PIO) needs to be sent to the incident site and coordinate with the DOE Office of Congressional and Intergovernmental Affairs (CI) as necessary. The public information officer would report to the incident commander and serve as the DOE public information liaison between the scene and appropriate DOE offices. The DOE PIO will assist the incident commander or his/her public information officer in public information and media activities with the local, State, and Tribal authorities.

- j. If a Joint Information Center (JIC) is established by the on-scene commander, the DOE PIO will report to the JIC and support public information efforts.
- k. The DOE PIO 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.
- l. The cognizant DOE organization, in coordination with the DOE shipper and the Office of Public Affairs, will issue statements or news releases about the incident as deemed appropriate, in a timely manner, appropriate to the severity of the event. DOE organizations should attempt to review news releases or statements that reference State, Tribal, or local actions with the appropriate authority before release. Likewise, DOE organizations should attempt to review news releases or statements from State, Tribal, or local authorities that describe the DOE shipment or DOE actions before release.
- m. 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 PIO arrives. Public information will be under the control of the Senior Energy Official on-scene until relieved. All public information releases will be coordinated with the DOE/NNSA CI; 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.

14.3.2 In accordance with DOT requirements, a commercial 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.

During an emergency, the DOE shipper will work with the carrier to maximize effectiveness of the carrier's response.

14.3.3 The cognizant DOE RRC will:

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

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

15.0 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 in accordance with hazardous waste regulations.

15.2 Highway

All commercial 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 for nuclear damage resulting from a nuclear incident would be provided under provisions of the Price-Anderson Amendments Act (Public Law 100-408). Additionally, the Nuclear/Radiological Incident Annex describes incident management activities related to nuclear/radiological incidents.

15.2.1 Non-Classified Shipments

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

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 NWP, DOE will require the carrier of spent nuclear fuel to follow 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.

Commercial carriers will act in accordance with 49 CFR 387.7.

15.2.2 Classified National Security Shipments

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

15.3 Rail

For spent nuclear fuel, high-level waste, inter-site TRU waste, 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 for nuclear damage from a nuclear incident would be provided under provisions of the Price-Anderson Amendment Act.

CONTRACTOR REQUIREMENTS DOCUMENT
DOE M 460.2-1A, *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 act in accordance 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 must 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 be undertaken in accordance 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 (SNF), high-level waste (HLW), tritium-bearing reactor components, and transuranic (TRU) waste shipments and submit it to the appropriate field element. (TRU waste shipments shall follow the WIPP Transportation Plan (DOE/CBFO 98-3103)). Transportation plans describe operational strategy and delineate steps that will be taken to meet applicable regulatory and DOE requirements. Specific contents of transportation plans are determined by the program office and/or operations office, but should include organizational roles and responsibilities, material to be shipped, projected shipping dates, estimated number of shipments, mode of transport and carriers to be used, packages to be used, preferred and/or alternative routes, shipment pre-notifications required, safe parking arrangements, tracking systems that will be used, emergency preparedness and response plans, recovery and cleanup strategy, security and escort arrangements, and a public information plan.

At the direction of the responsible program office or field element, the contractor must prepare a transportation plan for low-level and mixed low-level, or other radioactive shipments. The contractor must also assist in preparing public information materials such as fact sheets, briefing packages, press releases, etc.
 - b. Routing. For nonclassified shipments (by highway and rail) of spent nuclear fuel, high-level waste, and tritium-bearing reactor components, the contractor must perform an analysis of proposed routes using transportation models such as Transportation Routing Analysis Geographic Information System.
 - c. Security. The contractor must ensure that a security plan is developed and includes an assessment of possible transportation security risks for radioactive

shipments. The plan must contain sufficient background to understand the nature of threats against the radioactive shipment, the means to identify the vulnerabilities to those threats; and an approach to address the vulnerabilities.

- (1) For shipments of SNF and HLW, security will be provided in accordance with the requirements set forth in 10 CFR 73. The contractor must ensure that in-transit requirements are addressed, including developing security plans, implementing physical security access controls, training, escorts, inspections, tracking, communications, and employee background checks. Transport security must be coordinated with State and Tribal law enforcement officials and the involved railroad and motor carriers.
 - (2) For shipments of low-level waste, mixed low-level waste, and other radioactive shipments, the contractor will develop a security plan when required by 49 CFR 172.800.
- d. 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 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.
- e. Shipment Prenotification. Before shipping SNF or HLW 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. For low-level or mixed-low level waste, or other radioactive shipments, the contractor must provide notifications to affected States based on negotiated agreements.
- f. Transportation Operational Contingencies. For SNF, HLW, tritium-bearing reactor components, and transuranic waste shipments, the contractor must concur with the carrier that travel conditions are considered acceptable before dispatch and consider information provided by States or Tribes regarding weather or road conditions. In the event of any substantial unanticipated delay in transit (greater than 2 hours), the contractor must notify the affected States and Tribes of the event through the DOE Transportation Tracking and Communications System (TRANSCOM).
- g. 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 (unless other arrangements have been made).
- h. Inspections. The contractor must ensure preshipment inspections are done by the shipper and/or carrier to ensure that shipments meet the regulatory standards. For highway shipments of spent nuclear fuel, high-level waste, tritium-bearing reactor components, and transuranic waste, 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.
- i. 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 SNF, HLW, tritium-bearing reactor components, and transuranic waste, 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 (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. Waste that contains both source, special nuclear, or by-product material subject to the *Atomic Energy Act of 1954*, as amended, and a hazardous component subject to the

Resource Conservation and Recovery Act. [Adapted from: *Federal Facility Compliance Act of 1992*]

Prospective Shipments Module. A document which provides 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 containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in the table in §173.436 or values derived according to the instructions in §173.433. (See 49 CFR 173.403)

Radioactive Waste. Material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, for which no further use is intended.

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. Nuclear reactor fuel previously used as part of a fuel assembly to sustain nuclear fission in a self-supporting chain reaction in excess of 100 grams in net weight, exclusive of cladding or other structural or packaging material and has a dose rate exceeding 100 rems per hour at a distance of 3 feet from any accessible surface without intervening shielding.

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. (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 that, together with its radioactive contents limited to A1 or A2 as appropriate, meets the requirements of 49 CFR 173.410 and 173.412 and is designed to retain the integrity of containment and shielding required by 49 CFR 173.403 under normal conditions of transport as demonstrated by the tests set for in 49 CFR 173.465 or 173.466. They are typically constructed of steel, wood, or fiberboard, and generally have an inner containment vessel made of glass, plastic, or metal surrounded with packing material made of polyethylene, rubber, or vermiculite. Examples of material typically shipped in Type A Packages include nuclear medicines (radiopharmaceuticals), radioactive waste, and radioactive sources used in industrial applications.

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. (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. (10 CFR 1017.3)

ACRONYMS

ANSI	American National Standards Institute
AAR	Association of American Railroads
CBFO	Carlsbad Field Office
CDL	commercial driver's license
CFR	Code of Federal Regulations
CI	Office of Congressional and Intergovernmental Affairs
CVSA	Commercial Vehicle Safety Alliance
DHS	U.S. Department of Homeland Security
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
FRA	Federal Railroad Administration
HLW	high-level waste
JIC	Joint Information Command
LLW	low-level waste
MERRTT	Modular Emergency Response Radiological Transportation Training
MLLW	mixed low-level waste
NEPA	National Environmental Policy Act
NRC	Nuclear Regulatory Commission
NNPP	Naval Nuclear Propulsion Program
NNSA	National Nuclear Security Administration
NWPA	Nuclear Waste Policy Act of 1982, as amended
OCRWM	Office of Civilian Radioactive Waste Management
OST	Office of Secure Transportation
OUO	Official Use Only
PIO	Public Information Officer
RAP	Radiological Assistance Program
RRC	Regional Response Coordinator
SNF	spent nuclear fuel
TEC/WG	Transportation External Coordination Working Group
TECC	Transportation Emergency Communications Center
TEPP	Transportation Emergency Preparedness Program
TL	truckload
TRAGIS	Transportation Routing Analysis Geographic Information System
TRANSCOM	Transportation Tracking and Communications System
TRU	transuranic
UCNI	Unclassified Controlled Nuclear Information
WIPP	Waste Isolation Pilot Plant

SUMMARY OF RESOURCES

In fulfilling its diverse civilian and defense missions, the DOE transports various types of radioactive materials and wastes around the country. Types of radiological shipments include materials and isotopes for medical, industrial, and research uses; weapons and weapons-related materials; radioactive waste; plutonium residues and oxides; highly enriched uranium; spent nuclear fuel; and new (unirradiated or unused) nuclear fuel. Each DOE organization has additional information available on the internet. Key sites include:

Office of Environmental Management: In 1989, the Department of Energy created the Office of Environmental Management (EM) to mitigate the risks and hazards posed by the legacy of nuclear weapons production and research. Although the nation continues to maintain an arsenal of nuclear weapons, as well as some production capability, the United States has embarked on new missions. The most ambitious and far ranging of these missions is dealing with the environmental legacy of the Cold War. Like most industrial and manufacturing operations, the nuclear complex has generated waste, pollution, and contamination. However, many problems posed by its operations are unique. They include unprecedented amounts of contaminated waste, water, and soil, and a vast number of contaminated structures that will remain radioactive for thousands of years. <http://www.em.doe.gov/pages/emhome.aspx>

- Office of Transportation. <http://www.em.doe.gov/Pages/Transportation.aspx> From this site, you can follow the links to:
 - Transportation Emergency Preparedness Program (<http://www.em.doe.gov/TEPPPages/TEPPHome.aspx>) From this web site, you can access the 24-hour points of contact, and other related TEPP information.
 - Fact Sheets and publications covering transportation, packaging and regulations for shipping radioactive materials/wastes.
 - Transportation Routing Analysis Geographic Information System (TRAGIS) is a routing analysis tool combining graphical interfaces with an extensive highway, rail, and waterway database. TRAGIS can be used to calculate detailed routes based on user-specified parameters, and replace the legacy HIGHWAY and INTERLINE routing models. <https://tragis.ornl.gov/tragis.htm>
 - RADTRAN is the national and international standard for transportation risk assessment for radioactive materials. RADTRAN combines user-determined demographic, routing, transportation, packaging, and materials data with meteorological data (partly user-determined) and health physics data to calculate expected radiological consequences of incident-free radioactive materials transportation and associated accident risks. <https://radtran.sandia.gov/>
- The Waste Isolation Pilot Plant, or WIPP, is the world's first underground repository licensed to safely and permanently dispose of transuranic radioactive waste left from the

research and production of nuclear weapons. WIPP began operations on March 26, 1999.
<http://www.wipp.energy.gov/>

- **TRANSCOM2000** is the Department of Energy (DOE) Tracking and Communications System used to monitor the progress of various unclassified “high visibility” shipments, such as spent nuclear fuel, high-level and transuranic radioactive waste. With a demonstrated 99.8% reliability this nationwide 24-hour per day tracking system combines satellite and ground-based communications to monitor the progress of DOE truck, rail, barge, and ocean vessel shipments in near real time. TRANSCOM2000 has been used to monitor over 7,500 DOE high visibility shipments since its deployment in September 2001. The TRANSCOM2000 system is administered by the DOE Office of Environmental Management. The TRANSCOM2000 Communications Center is located in Carlsbad, New Mexico. For additional information contact TRANSCOM2000 Federal Program Manager at (505) 234-7372 or visit the website at:
<http://tcc.transcom.energy.gov/>
- Office of Civilian Radioactive Waste Management is responsible for developing and managing a federal system for disposing of spent nuclear fuel from commercial nuclear reactors and high-level radioactive waste from national defense activities.
<http://www.ocrwm.doe.gov/about/index.shtml> From this site, you can access information on:
 - Transportation Exhibit
 - Transportation Strategic Plan (PDF)
 - Safe Passage: An Overview of Plans for the Railroad to Yucca Mountain
 - Transportation of Spent Nuclear Fuel and High-Level Radioactive Waste to Yucca Mountain, Frequently Asked Questions—This brochure provides information about transportation of radioactive waste to the proposed repository at Yucca Mountain, for permanent disposal. Topics covered include basics on radioactive waste, transportation safety and security, the transportation system infrastructure and emergency planning and response.
 - Transportation External Coordination Working Group
<http://tecworkinggroup.org/>