

U.S. Department of Energy Orders Self-Study Program

DOE O 460.1B

PACKAGING AND TRANSPORTATION SAFETY

DOE O 460.2

DEPARTMENTAL MATERIALS TRANSPORTATION AND
PACKAGING MANAGEMENT



**NATIONAL NUCLEAR SECURITY ADMINISTRATION
SERVICE CENTER**

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

DOE O 460.1B
PACKAGING AND TRANSPORTATION SAFETY
DOE O 460.2
DEPARTMENTAL MATERIALS TRANSPORTATION AND
PACKAGING MANAGEMENT
FAMILIAR LEVEL

OBJECTIVES

Given the familiar level of this module and the resources, you will be able to perform the following:

1. State the objectives of implementing U.S. Department of Energy (DOE) O 460.1B.
2. Discuss the DOE/National Nuclear Security Administration (NNSA) exemption process in DOE O 460.1B.
3. State the special requirements for radioactive material packagings prescribed by DOE O 460.1B for:
 - strong, tight containers and industrial packagings
 - Type A radioactive material packagings,
 - Type B or fissile radioactive material packagings, and
 - plutonium packagings.
4. State the onsite safety requirements specified by DOE O 460.1B.
5. Describe the training requirements for those who transport or provide transportation of hazardous materials and waste.
6. State the objectives of implementing DOE O 460.2.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

7. List the elements that must be included in a transportation plan.
8. 8. List the categories of shipments that must be tracked using the DOE Transportation Tracking and Communications System (TRANSCOM).
9. List the types of shipments that are excluded from DOE O 460.2.
10. State the responsibilities assigned by DOE O 460.2 to the following:
 - Assistant Secretary for Environmental Management (EM-1)
 - Program Officers
 - Assistant Secretary for Environment, Safety, and Health (EH-1)
 - Heads of Field Elements
11. State the requirements for the receipt of hazardous material.
12. Identify who must be notified before shipping spent fuel or high-level waste and describe how the notifications should be made.
13. Discuss the actions taken if a delivery conveyance is contaminated.
14. Discuss the Transportation Emergency Preparedness Plan (TEPP).

RESOURCES

DOE Order 460.1B, Packaging and Transportation Safety, 4/4/03.

DOE Order 460.2 Chg1, Departmental Materials Transportation and Packaging Management, Change 1, 10/26/95.

DOE Guide 460.1-1, Implementation Guide for Use with DOE O 460.1A, 6/5/97.

DOE Guide 460.2-1, Implementation Guide for Use with DOE O 460.2, 11/15/96.

DOE Manual 460.2-1, Radioactive Materials Transportation Practices Manual for Use with DOE O 460.2, 9/23/02.

10 CFR 71, Packaging and Transportation of Radioactive Material.

49 USC Chapter 51, Transportation of Hazardous Material.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

49 CFR 173, Shippers – General Regulations for Shipment and Packagings.
49 CFR 107, Hazardous Materials Program Procedures.
49 CFR 171-180, Research and Special Programs Administrator, Department of
Transportation.

Change No: 1
DOE O 460.1B & O 460.2
Level: Familiar
Date: 11/9/04

Note: If you think that you can complete the practice at the end of this level without working through the instructional material and/or the examples, complete the practice now. The course manager will check your work. You will need to complete the practice in this level successfully before taking the criterion test.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

INTRODUCTION

The familiar level of this module is divided into two sections. The objectives, requirements and responsibilities of DOE O 460.1B and DOE O 460.2 will be discussed in the first and second sections, respectively. Several examples and practices throughout the module are provided to help familiarize you with the material. The practices will also help prepare you for the criterion test.

Before continuing, you should obtain a copy of the Orders and implementation guides and manuals for this module. Copies of the Orders are available on the internet at <http://www.directives.doe.gov> or through the course manager. You should also be familiar with the Federal Regulations although it is not necessary to copy all of the CFRs listed as resources. Spend some time reviewing the documents so that you are familiar with the sections each contains. You will need to refer to these documents to complete the examples, practice, and criterion test.

SECTION 1, DOE O 460.1B, PACKAGING AND TRANSPORTATION SAFETY

OBJECTIVES

To establish safety requirements for the proper packaging and transportation of DOE off-site shipments and onsite transfers of hazardous materials and modal transport.

APPLICABILITY

Except for the exclusions identified in the Order, the requirements apply to DOE/NNSA elements and contractors. Contractor requirements are provided in attachment 1 of the Order.

REQUIREMENTS

In this section, we will discuss some of the requirements included in this Order and the implementation guide. Requirements related to the following elements will be discussed.

- off-site hazardous and radioactive materials packaging and transportation safety
- on-site safety requirements
- motor carrier safety requirements
- training

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

Off-site Hazardous Materials Packaging and Transportation Safety

DOE O 460.1B requires each person who offers for transportation or transports a package of hazardous materials to comply with the Hazardous Materials Regulations (49 CFR 171-180) under the Department of Transportation (DOT) and applicable tribal state and local regulations. The contractor requirements document (CRD) defines the responsibilities of the contractor for compliance with DOT regulations for off-site shipments or with DOE/NNSA.

DOE/NNSA may grant temporary or permanent exemptions to its directives provided such exemptions are not prohibited by law and do not present an undue risk to public health and safety, the environment, or facility workers.

Completed exemption packaging requests are to be submitted to the Site Office Manager, NNSA. Exemption requests shall include the following information:

- citation of the regulation to be exempted
- proposed mode(s) of transportation
- detailed description of the proposed exemption
- schedule of events
- statement to outline the basis for the exemption
- description of the material

The process to expedite an emergency exemption, modifications to the exemption and appeals are provided in 49 CFR 107, Hazardous Materials Program Procedures. Exemption requests from the DOE for off-site shipments shall be submitted in accordance with 49 CFR 107. Additional details on the exemption process are provided in DOE G 460.1-1.

Quality Assurance

Each person who participates in the design, fabrication, procurement, use, or maintenance of hazardous materials packaging shall have an approved quality assurance program, that meets the requirements of 10 CFR 71 for Type B and fissile radioactive material packaging. All other radioactive and hazardous materials should meet the requirements of DOE O 414.1B. To support the quality assurance program the following is required:

- reporting any instance in which there is significant reduction in the effectiveness of any approved Type B, or fissile, packaging during use;

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

- providing details of any defects with safety significance in Type B, or fissile, packaging after first use, with the means employed to repair the defects and prevent their recurrence; or
- reporting instances in which the conditions of approval in the certificate of compliance were not observed in making a shipment.

Special Requirements for Radioactive Material Packaging

Strong, tight containers or industrial packaging shall be provided for the transport of low specific activity (LSA) materials as defined in 49 CFR 173.427. Additional requirements for Type A and Type B radioactive material packagings are provided in 49 CFR 173.415 and 49 CFR 173.416-417, respectively.

Type A Radioactive Material Packagings

Material can be transported in packagings authorized by 49 CFR 173.415 or Type B packagings.

Type B Radioactive or Fissile Material Packagings

Packaging may be used that is certified by the Assistant Secretary for Environmental Management or a Secretarial Officer/Deputy Administrator, NNSA, pursuant to 49 CFR 173.7(d) or as authorized by 49 CFR 173.416 – 417. For quantities exceeding A_1 or A_2 or fissile quantity of radioactive materials, the packaging must be certified. Applications for package certification must include a safety analysis report for packaging (SARP). DOE certificates are issued for a specified period of time. Additional information on the SARP preparation process is provided in DOE G 460.1-1.

Plutonium Packagings

The Assistant Secretary for Environmental Management or another Secretarial Officer/Deputy Administrator, NNSA or the NRC have the authority for packagings of the following:

- transportation of plutonium in excess of 20 Curies per package and
- air transportation of Type B quantities of plutonium.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

Transport by Air

Plutonium in any form can be transported by air under the following conditions as specified in 10 CFR 71, Subpart G:

- The plutonium is contained in a medical device designed for individual human application;
- The plutonium is contained in a material in which the specific activity is less than or equal to the activity concentration values for plutonium specified in appendix A, table A-2, of this part, and in which the radioactivity is essentially uniformly distributed;
- The plutonium is shipped in a single package containing no more than an A₂ quantity of plutonium in any isotope or form, and is shipped in accordance with 71.5; or
- The plutonium is shipped in a package specifically authorized for the shipment of plutonium by air in the Certificate of Compliance for that package issued by the U.S. Nuclear Regulatory Commission.

Onsite Safety Requirements

Onsite hazardous materials transfers shall comply with 49 CFR 171 – 180 or the site- or facility-specific office approved, transportation safety document (TSD) that describes the methodology and compliance process to meet equivalent safety for any deviation from the Hazardous Materials Regulations. For multiple-tenant DOE sites, safety documents for several contractor organizations may be combined into a single document. DOE-operated sites may approve their own TSDs. TSDs should contain the following information:

- identification of responsibilities, lines of authority, and program approval procedures;
- definition of minimum safe packaging requirements including necessary design, fabrication, and quality assurance elements, using appropriate codes and standards;
- description of transportation systems and operational controls utilized to restrict personnel and public access and minimize the probability and consequence of credible accidents;
- process description;
- analysis of each deviation from the Hazardous Materials Regulations;

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

- site description, including maps identifying boundaries, railways, and roadways, which clearly delineates offsite and onsite areas, and procedures for clearing and establishing access control for any area having occasional public access;
- provisions for effective emergency response and recovery under credible accident conditions; and
- the process for accomplishing non-routine packaging and transportation activities.

Motor Carrier Safety Requirements

Each contractor who operates a government-owned or commercial motor vehicle offsite shall comply with Federal Motor Carrier Safety Regulations (49 CFR Parts 350-399) and applicable tribal, state, and local regulations not otherwise preempted by DOT.

Training

Each person who offers for transportation or transports or transfers hazardous materials, substances, and wastes shall

- develop and implement a training program and procedures for the safe packaging, transfer, and transportation of hazardous materials, substances, and wastes;
- assure that all personnel who support and/or perform packaging, transfer, and transportation operations are appropriately trained and qualified; and
- maintain auditable training records in accord with approved DOE or site-specific records schedules.

RESPONSIBILITIES

The responsibilities listed in the Order are for the Office of Environmental Management, Secretarial Officers/Deputy Administrators, NNSA and Site Office Managers, NNSA. The Office of Environmental Management and Secretarial Offices/Deputy Administrators, NNSA share several responsibilities. A complete list of the responsibilities is provided in DOE O 460.1B. The Site Office Managers, NNSA have the following responsibilities:

- Review and approve, in writing, onsite TSDs and transportation and package quality assurance programs.
- Review and process SARPs through the Secretarial Officer/Deputy Administrator, NNSA, responsible for the facilities or activities applying for package certification.

Change No: 1
DOE O 460.1B & O 460.2
Level: Familiar
Date: 11/9/04

- Support development of programs to share packaging and transportation safety successes and problems.
- Obtain waivers from tribal, state and local transportation laws, rules and regulations, as needed to meet safety requirements.

Note: You do not have to do example 1 on the following pages, but it is a good time to check your skill and knowledge of the information covered. You may do the example 1 or go to section 2.

Change No: 1
DOE O 460.1B & O 460.2
Level: Familiar
Date: 11/9/04

4. Describe the training requirements for those who transport or provide transportation of hazardous materials and waste.

Note: When you are finished, compare your answers to those contained in the example 1 self-check. When you are satisfied with your answers, go to section 2.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

EXAMPLE 1 SELF-CHECK

1. State in your words what the DOE hopes to achieve by implementing DOE O 460.1B.
To establish safety requirements for the proper packaging and transportation of DOE/NNSA offsite shipments and onsite transfers of hazardous materials and modal transport.
2. List the conditions under which an exemption can be requested and the regulation describing the DOE/NNSA exemption procedures.
 - The proposed exemption:
 - is not prohibited by law
 - does not present an undue risk to public health and safety, the environment, or workers
 - The regulation is 10 CFR 107, Hazardous Materials Program Procedures.
 -
3. State the basic requirements for onsite safety specified in this Order.
Onsite hazardous materials transfers shall comply with 49 CFR Parts 171-180 or the site- or facility-specific office approved TSD that describes the methodology and compliance process to meet equivalent safety for any deviation from the Hazardous Materials Regulations. For multiple-tenant DOE/NNSA sites, safety documents for several contractor organizations may be combined into a single document. DOE-operated sites may approve their own TSDs.
4. Describe the training requirements for those who transport or provide transportation of hazardous materials and waste.
Each person who offers for transportation or transports or transfers hazardous materials, substances, and wastes shall
 - develop and implement a training program and procedures for the safe packaging, transfer, and transportation of hazardous materials, substances, and wastes;
 - assure that all personnel who support and/or perform packaging, transfer, and transportation operations are appropriately trained and qualified; and

Change No: 1
DOE O 460.1B & O 460.2
Level: Familiar
Date: 11/9/04

- maintain auditable training records in accord with approved DOE or site-specific records schedules.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

SECTION 2, DOE O 460.2, DEPARTMENTAL MATERIALS TRANSPORTATION AND PACKAGING MANAGEMENT

This section will address the objectives, requirements, and responsibilities contained in DOE O 460.2.

OBJECTIVES

To establish DOE policies and requirements to supplement applicable laws, rules, regulations, and other DOE Orders for materials transportation and packaging operations.

APPLICABILITY

This Order applies to DOE Elements performing or managing the transportation and packaging at offsite materials to be shipped to or from a DOE facility. The CRD in attachment 1 of the Order provides the requirements for contractors and subcontractors involved in transportation and packaging operations.

REQUIREMENTS

This section includes a summary of the major requirements in DOE O 460.2 and the non-mandatory requirements in DOE G 460.2-1, Implementation Guide for Use with DOE O 460.2. DOE M 460.2-1, Radioactive Material Transportation Practices Manual for Use with DOE O 460.2, provides additional guidance to supplement the Order. The following components of materials transportation and packaging management will be discussed.

- Transportation plan
- DOE TRANSCOM
- Shipment procedures
- Receipt of hazardous material
- Emergency planning

Transportation and packaging operations will be assessed at least once every 3 years for each DOE contractor facility.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

Transportation Plan

DOE field elements shall ensure that a transportation plan consists of the following:

- information describing material type
- shipping dates
- estimated number and weight of shipments
- mode of transport
- carrier proposed route
- packaging description
- cargo security arrangements

The plan should be submitted to the Office of Environmental Management (EM) with information on shipments of spent nuclear fuel, high-level waste, and high-visibility shipments and campaigns as determined by the cognizant Program Officer. All DOE sites and contractors preparing a transportation plan shall use the Prospective Shipments Module of the Transportation Information Network in the development of their plan.

Transportation Tracking and Communication System

DOE field elements shall ensure that DOE TRANSCOM shall be used for tracking and monitoring the following categories of shipments according to the TRANSCOM operations system manuals:

- Spent nuclear fuel
- High-level waste
- High-visibility shipments and campaigns as determined by the cognizant Secretarial Officers

Authorized users; such as DOE shipping/receiving facilities, emergency operations centers, states, tribal jurisdictions, and governmental agencies may access the system maintained at the TRANSCOM control center and receive shipment location information and other data.

Anyone requesting use of TRANSCOM to monitor a materials shipment should apply, in writing, to EM-76 for authorization. When a shipment qualifies for TRANSCOM services, the requester will receive notification from EM-76. Anyone who wishes to become an

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

authorized user and wants to obtain information directly from TRANSCOM must be approved by EM-76 and be trained to use the system.

The document, *Guidelines to Ensure Proper Tracking and Communications for DOE Shipments Requiring the Use of the TRANSCOM System*, identifies measures to enhance safe, effective transport of shipments and facilitate communication of DOE transportation activities to appropriate stakeholders. This document is provided to authorized TRANSCOM users.

Shipment Procedures

All hazardous materials shipments shall be properly packaged, marked, and labeled to meet requirements of normal transport.

To the maximum extent practicable, the Automated Transportation Management System (ATMS) shall be used to perform transportation tasks. For detailed information on, and access to, the ATMS, refer to the Transportation Operations Manual, Functional Requirements for the ATMS Document.

- All commercial bills of lading, air bills, and other commercial documents covering shipments made by or to DOE on DOE's behalf shall provide consignment of the shipments to, or from, DOE in care of the department's contractor, or from the department's contractor for DOE.

DOE field elements shall forward requests for military air transportation service to EM-1. Requests shall include a certification by the Program Officer or the or field office that such transportation is in the national interest and that commercial air transportation is not readily obtainable or capable of meeting program requirements.

The originator of any shipment should provide the designated contractor with documents that indicate the following:

- material description
- how it is packaged
- number of packages
- destination and recipient
- a statement of any urgency
- any special additional information

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

For freight payment purposes, proper classification of DOE materials for each shipment shall be described on the bill of lading, waste manifest, or other shipping documents as specified in the governing freight classification, carrier's tariff, or rate tender. Broad descriptions that are not provided in tariffs should not be used. Accuracy and completeness are essential.

The mode and the carrier should be selected to meet the requirements of each shipment and to provide safe, expeditious, and economical delivery to destination. Only carriers with satisfactory ratings under the Motor Carrier Evaluation Program should be considered for highway route controlled quantities of radioactive materials in less-than-truckload or truckload (TL) quantities, any TL quantities of radioactive material, or hazardous waste in any quantity.

Consolidation of shipments should be considered whenever such arrangements result in transportation or administrative economies. In determining if separate shipments may be advantageously consolidated, consideration should be given to

- established stop-off privileges for partial loading or unloading at intermediate locations;
- inclusion of small lots in the same car or trailer with carload or truckload quantities;
- possibly using freight forwarder services; and
- environment, safety, and health implications.

Opportunities for consolidation between the various field organizations should be considered.

Procedures for Notification of States and Tribes (Spent Fuel or High-Level Waste Shipments)

Before shipping spent fuel or high-level waste within or through a state or tribal jurisdiction, DOE shall send a return receipt registered letter to the state governor, and if necessary, the designated tribal point of contact, postmarked at least 7 days before a shipment.

Alternatively, DOE may send a notification 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 list of mailing addresses of governors has been provided to the

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

manager of each site office. Updates of this list are published each year in the June 30 issue of the Federal Register, which is available through the Internet.

Contractors who are unable to obtain the latest Federal Register listing should contact the Office of Transportation, Emergency Management, and Analytical Services (EM-76).

Information is also available from EM-76 on tribal contacts for notification purposes.

Written notification should include the following information:

- name, address, and telephone number of shipper, carrier, and receiver;
- description of the shipment as specified by the DOT in 49 CFR, Parts 172.202 and 172.203;
- a listing of routes to be used within the state or through tribal jurisdictions;
- estimated date and time of departure from point of origin;
- estimated date and time of entry into the governor's state and/or into tribal lands; and
- estimated date and time of departure from the governor's state and/or tribal jurisdiction.

DOE shall ensure that the state or tribe is notified by telephone of schedule changes that differ more than 6 hours from the information furnished in the written notification. A record shall be retained in the shipping records file that includes the name of the person(s) contacted and the date and time of the contact.

Consignee Notifications

The following notifications are required.

- For each shipment of fissile or more than Type A quantities of radioactive material, and for gas poisonous by inhalation, the shipper shall notify the consignee of the dates of the shipment, the expected date of arrival, and any special loading or unloading instructions.
- The DOE consignee shall notify the shipper by the end of the first working day after the estimated arrival date if the shipment has not been received.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

Receipt of Hazardous Materials Shipments.

DOE field elements shall ensure that all packages are inspected promptly upon receipt for damage or other evidence of possible leakage to ensure that any potential public exposure to hazardous materials will be identified and appropriate action can be taken and to expedite processing of loss and damage claims. All shipments of materials received should be inspected, if practicable, before the delivering conveyance departs.

When the DOE consignee picks up the shipment from the carrier's terminal facility the packages should be picked up as expeditiously as possible and checked for damage and leakage. In every case, visible damage should be photographed immediately. Visible damage must be noted on the carrier's delivery receipt before signing for receipt of goods.

All visible damage should be reported to the delivering carrier by telephone or facsimile transmission the same day. All goods must be inspected for concealed damage and the carrier notified within fifteen (15) days of receipt to ensure the carrier retains the burden of proof for claim settlements. Radioactive material shipments shall also be inspected for external surface contamination.

If a delivery conveyance is contaminated, the transport vehicle shall be detained and the delivering carrier immediately notified so that other potentially contaminated vehicles can be surveyed.

Emergency Planning

The DOE TEPP provides tools to state and tribal authorities to assist them in preparing for response to a transportation incident involving radioactive material. The goal of the TEPP is to establish consistent policies and implementing procedures, build public and institutional confidence, and demonstrate the ability to respond effectively. A TEPP coordinator is 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 non-classified radioactive material.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

RESPONSIBILITIES

The responsibilities associated with this Order are summarized below. A complete list of the responsibilities is available in DOE O 460.2, section 5.

Assistant Secretary for Environmental Management (EM-1)

- Establishes policy and guidance for DOE materials transportation and packaging management and assists DOE elements and contractors on related matters.
- Represents DOE in matters dealing with transportation and packaging operations with other federal entities.
- Coordinates DOE review of, participation in, and comment on international, federal, state, local, and tribal transportation and packaging operations regulations.
- Develops and submits petitions for rule-making actions concerning transportation and packaging operations-related matters.
- Develops, implements, and maintains computerized systems to support transportation and packaging management.
- Develops and provides initial and recurrent training on domestic and international transportation and packaging regulations, carrier and carrier association rules, and implementing DOE Orders.
- Reviews supporting documentation for explosives classification and files the applications with DOT for registration.
- Conducts technical assessments of DOE field elements.
- Prepares and maintains the DOE's annual Packaging Management Plan and Transportation and Packaging Research and Development Plan.
- Conducts formal needs assessments involving DOE field elements and contractors to identify and prioritize emerging transportation and packaging needs.

Additionally, the Assistant Secretary for Environmental Management establishes and manages a transportation logistics program that includes:

- the oversight of the DOE Motor Carrier Evaluation Program (MCEP);
- the negotiation of DOE freight rates and rules;
- the maintenance of centralized files for MCEP reports, freight rate tenders, and contracts; and

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

- interfaces with other federal and commercial entities on such matters as bill-of-lading audits, requests for military transportation services or equipment, and availability of commercial transport equipment to meet programmatic requirements.

Program Officers (POs)

- Ensure that DOE field elements and contractors under their purview, involved in performing or managing transportation and packaging, fully implement and comply with the requirements of this Order.
- Coordinate program-related transportation plans, proposed transportation computerized systems, transportation systems studies, and packaging development activities; training requirements, reports, and analyses with EM-1 to ensure consistency of policy and avoid duplication of efforts.
- Designate an individual(s) cognizant of program plans and requirements to serve as the point of contact for transportation and packaging interface(s) and integration of transportation and packaging activities into program planning.
- Conduct program reviews of transportation and packaging development activities under their purview and participate in the development of the department's Packaging Management and Transportation Research and Development Plans and Technical Review Board to ensure program needs are being addressed.

Assistant Secretary for Environment, Safety and Health (EH-1)

- Establishes policy and guidance for environmental protection, safety, and health with regard to DOE materials transportation and packaging.
- Through the Office of Oversight, conducts independent oversight of environmental protection, safety, health, and safeguards and security matters.

Heads of Field Elements

- Ensure that all DOE field elements and contractors under their purview involved in performing or managing transportation and packaging fully implement and comply with the requirements of this Order.

Change No: 1
DOE O 460.1B & O 460.2
Level: Familiar
Date: 11/9/04

- Obtain waivers from State, tribal, and local transportation operational requirements, as needed to meet programmatic requirements, and provide copies of all such requests and waivers to EM-1.
- Issue Price-Anderson indemnity agreement certificates to carriers, upon their request, or notify the requesting carriers and the referring organization, as applicable, that the shipment is not covered by an indemnity agreement.
- Negotiate with carriers, or authorize cost-type contractors to negotiate with carriers, concerning rates, classification ratings, services, and related transportation matters when their own DOE field element will be affected.
- Advise other field elements, EM-1, and cognizant DOE POs of significant freight rate changes, new or changing state, tribal, or local laws, rules, or regulations.
- Issue government bills of lading and authorize employees of cost-type contractors to issue government bills of lading within prescribed limitations.
- Conduct technical assessments of site transportation and packaging programs at least every 3 years.
- Determine whether to request a contracting officer to incorporate the requirements of the contractor's requirements document (CRD) into new or existing contracts or whether the requirements of the canceled Orders should remain effective as incorporated into existing contracts in order to provide adequate protection. Heads of field elements shall also determine when implementation of the requirements of the CRD is sufficient to provide adequate protection and may request the contracting officer to modify the contract to delete the requirements of the canceled Orders.

Note: You do not have to do example 2 on the following page, but it is a good time to check your skill and knowledge of the information covered. You may do the example 2 or go directly to the practice.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

EXAMPLE 2

1. List the categories of shipments that must be monitored and tracked via TRANSCOM.
2. State the actions that should be taken if a delivery conveyance is contaminated.
3. Identify the position that is responsible for conducting technical assessments of site transportation and packaging programs.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

4. Identify the position that is responsible for maintaining centralized files for the Motor Carrier Evaluation Program.

5. State the goal of the TEPP.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

EXAMPLE 2 SELF-CHECK

1. List the categories of shipments that must be monitored and tracked via TRANSCOM.
 - Spent nuclear fuel
 - High-level waste
 - High-visibility shipments and campaigns as determined by the cognizant Secretarial Officers.

2. State the actions that should be taken if a delivery conveyance is contaminated. If a delivery conveyance is contaminated, the transport vehicle shall be detained and the delivering carrier immediately notified.

3. Identify the position that is responsible for conducting technical assessments of site transportation and packaging programs.
Heads of field elements

4. Identify the position that is responsible for maintaining centralized files for the Motor Carrier Evaluation Program.
Assistant Secretary for Environmental Management

5. State the goal of the TEPP.
The goal of the TEPP is to establish consistent policies and implementing procedures, build public and institutional confidence, and demonstrate the ability to respond effectively.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: Familiar Date: 11/9/04 |
|--|

6. State three regulations related to transportation services and rates.

7. State the requirements for motor carrier safety.

8. State the requirements for plutonium packaging.

Change No: 1
DOE O 460.1B &
O 460.2
Level: General
Date: 11/9/04

**DOE O 460.1B
PACKAGING AND TRANSPORTATION SAFETY
DOE O 460.2
DEPARTMENTAL MATERIALS TRANSPORTATION AND PACKAGING
MANAGEMENT
GENERAL LEVEL**

OBJECTIVES

Given the familiar level of this module, a scenario, and an analysis, you will be able to perform the following:

1. List the key elements you would look for in the contractor's action plan to correct the situation described in the scenario; and
2. State which requirements, sections, or elements of DOE Orders 460.1B and 460.2 apply to the situation described in the scenario.

Note: If you think that you can complete the practice at the end of this level without working through the instructional material and/or the examples, complete the practice now. The course manager will check your work. You will need to complete the practice in this level successfully before taking the criterion test.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: General Date: 11/9/04 |
|--|

RESOURCES

DOE Order 460.1B, Packaging and Transportation Safety, 4/4/03.

DOE Order 460.2 Chg1, Departmental Materials Transportation and Packaging Management, Change 1, 10/26/95.

DOE Guide 460.1-1, Implementation Guide for Use with DOE O 460.1A, 6/5/97.

DOE Guide 460.2-1, Implementation Guide for Use with DOE O 460.2, 11/15/96.

DOE Manual 460.2-1, Radioactive Materials Transportation Practices Manual for Use with DOE O 460.2, 9/23/02.

10 CFR 71, Packaging and Transportation of Radioactive Material.

49 CFR 173, Shippers – General Regulations for Shipment and Packagings.

49 CFR 107, Hazardous Materials Program Procedures.

49 CFR 171-180, Research and Special Programs Administrator, Department of Transportation.

49 USC Chapter 51, Transportation of Hazardous Material.

Change No: 1
DOE O 460.1B &
O 460.2
Level: General
Date: 11/9/04

INTRODUCTION

The familiar level of this module introduced DOE Orders 460.1B and 460.2 and the associated supplemental guides and manuals. Several responsibilities and requirements from the Orders and the implementation guides were discussed. In the general level of this module, students are presented with a scenario that depicts a work situation related to the Orders. The example scenario includes a situation, the actions taken to remedy the situation, and the requirements related to the situation. Students will be asked to review the contractor's actions and decide if they are correct. Students will also be asked to decide if the correct requirements were cited in each situation. Please refer to the Orders, implementation guides and the other resources as necessary to make your analysis and answer the questions. You are not required to complete the example. However, doing so will help prepare you for the criterion test.

Note: You do not have to do the example on the following page, but it is a good time to check your skill and knowledge of the information covered. You may do the example or go on to the practice.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: General Date: 11/9/04 |
|--|

EXAMPLE SCENARIO

The following is an incident involving transportation of explosives.

Sandia National Laboratories (SNL) inadvertently shipped explosives in an explosive shipping pipe labeled empty through SNL's non-explosive shipping process to Mound Lab in Dayton, Ohio. This was part of a large shipment of pipes, all presumed empty, that had been sent to Mound on February 1, 1995. On March 13, 1995, Mound personnel opened the pipes in preparation for shipping explosive material and components to SNL and found eight explosive test units (approximately 100 milligrams explosive each) in pipes labeled empty. These test units may have originated in Area II from Department 2654 or they may have arrived at SNL in shipping pipes labeled empty. Department 2654 staff had tested similar units in April 1994; it was believed that all untested units had been returned to the program sponsor in May-June, 1994, through the proper SNL shipping channels.

Facility management initiated the following corrective actions:

- Develop procedures to inspect received empty hazardous material containers within two days of receipt.
- Request that explosive material container shippers send containers to Mound with no material inside.
- Facility personnel will treat empty hazardous material container shipments as potentially occupied until proven otherwise.
- Procedures will be developed to address the receipt of such shipments.
- Although a training program for the safe packaging transfer and transportation of hazardous materials does not exist, Sandia personnel were provided training.

The requirements related to this scenario are:

- DOE field elements shall ensure that shipments are inspected upon receipt for damage or loss, and evidence of leakage. [DOE O 460.2, paragraph 4e(1)]
- Before transporting new explosive substances and articles, including devices, made by DOE or under its direction or supervision, the DOE field element shall test them and obtain a classification approval from the appropriate site office. The DOE field element shall provide a copy of the approval and supporting documentation to EM-1 for

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: General Date: 11/9/04 |
|--|

registration with DOT. EM-1 will then register the explosive with the DOT. [DOE O 460.2, paragraph 4i]

- All hazardous materials shipments shall be properly packaged, marked, and labeled to meet requirements of normal transport. (DOE G 460.2-1, paragraph 3.1.1)

Take some time to review the example scenario and the actions the contractor took to correct the situation. Then decide if the contractor's actions were complete and correct. Finally, determine if the requirements, sections, or elements of DOE O 460.1B and O 460.2 that were cited in this scenario are correct.

Write your answers below and then compare your answer to the one contained in the example self-check.

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: General Date: 11/9/04 |
|--|

EXAMPLE SELF-CHECK

Your answer does not have to match the following exactly. You may have added more corrective actions or cited other requirements from the Order that apply. To be considered correct, your answer must include, at least, the following.

- The contractor's actions were incomplete.
- A training program and procedures for transfer and transport of hazardous materials must be developed and implemented..
- The second requirement, DOE O 460.2, paragraph 4i is not appropriate. The pipe was labeled empty. Therefore there would be no reason to test any explosive substances.
- The other two requirements cited were correct.
- The following DOE citation is missing: Develop and implement a training program and procedures for the safe packaging, transfer and transportation of hazardous materials, substances, and wastes. [DOE O 460.1B, paragraph 4.g(1)]

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: General Date: 11/9/04 |
|--|

PRACTICE

This practice is required if your proficiency is to be verified at the general level. The practice will prepare you for the criterion test. You will need to refer to the Orders and the implementation guide to answer the questions in the practice correctly. The practice and criterion test will also challenge additional analytical skills that you have acquired in other formal and on-the-job training.

Please review the scenario and answer the following questions.

1. Was the situation handled correctly? If not, what should have been done?
2. Was the list of requirements, sections, and elements complete and correct? If not, state the correct or omitted requirements.

SCENARIO

During a DOE review of the inspection and packaging procedure used to prepare the model DU (type 20-WC-2A) overpack container, a concern was raised that the existing facility procedure did not include an adequate visual inspection for corrosion of the wooden overpack body threaded rods. It was determined that the only means of completing this inspection would require a total disassembly of the container internal and external package.

The packages were completely disassembled and a visual inspection completed. It was discovered that the wooden cask protective jacket would not allow a complete removal of the threaded rods for visual inspection. It was also noted that the wooden protective jacket had cracks and significant separation of the plywood body discs in the lower area of the package. In one case the plywood separated completely when the package was disassembled. This damage is not permitted for use of this type of overpack container. The damaged areas had not previously been visible without complete disassembly of the package. A review of the supporting documents and previous usage was conducted. The documentation on hand was for a 20-WC-2 overpack configuration and it was assumed to be acceptable as a specification 20-WC-2A overpack, since they were recently used by other DOE laboratories in this capacity.

The review indicated that there were no provisions for use of a 20-WC-2A overpack in the Code

| |
|--|
| Change No: 1 DOE O 460.1B & O 460.2 Level: General Date: 11/9/04 |
|--|

of Federal Regulations, Title 49 (49 CFR). The CFR specifications were for a 20-WC-2 only and did not address a 20-WC-2A overpack. It was discovered that the 20-WC-2A designation was intended to refer to a cask/overpack combination licensed under Competent Authority Certification for a Type B (U) Radioactive Materials Package Design Certificate USA/9098/D (U) and was not applicable for iridium shipments.

Eleven domestic shipments had been completed using these 20-WC-2A overpacks. The previous use of these overpacks constituted a shipping violation since they do not meet DOT specifications for a 20-WC-2 overpack.

An investigation of the incident revealed the following.

The documentation necessary to ensure that the over packs were satisfactory for their intended use could not be located. The hazardous material shipper had relied upon the assurance of other DOE laboratories, and the previous use of these containers by that laboratory, as a confirmation that these containers were satisfactory for shipment of iridium radioisotope material. The other laboratory had provided some documentation to substantiate this conclusion. However, a more thorough review of the documents could not substantiate the claim that the overpacks were approved as specification jackets.

The shipping containers had been provided by another laboratory. There were no procedures on hand for maintenance of the overpacks. The defects identified when the containers were disassembled could have been identified at an earlier date had an active maintenance program and procedure been in place. External visual examination of the overpacks had been completed as part of the loading procedure. However, the lack of a requirement to disassemble the overpacks precluded finding hidden material defects.

Management involvement, including clear determination of the responsibilities of various elements of the contractor organization to maintain containers, establish current document files, and meet other container requirements, had not been established.

Corrective actions taken by the contractor.

- Complete a review of all supporting documents for the licensing and use of radioisotope

Change No: 1
DOE O 460.1B &
O 460.2
Level: General
Date: 11/9/04

shipping containers.

- Establish a controlled document file for the maintenance of supporting documentation.

The requirements related to this scenario are:

- Each person who offers for transportation or transports a package of hazardous materials shall comply with the requirements of the Hazardous Materials Regulations (Title 49 CFR Parts 171-180) and applicable tribal, state, and local regulations not otherwise preempted by the U.S. DOT. [DOE O 460.1B, Section 4, paragraph a.(1)]

Write your answers to questions 1 and 2 below and then bring the completed practice to the course manager for review.

Note: The course manager will check your practice and verify your success at the general level. When you have successfully completed this practice, the course manager will give you the criterion test.