U.S. Department of Energy
Washington, DC

ORDER

DRAFT
DOE O 460.1D

Approved XX-XX-2016

SUBJECT: HAZARDOUS MATERIALS PACKAGING AND TRANSPORTATION SAFETY

1. PURPOSE. This Order of the Department of Energy (DOE), including the National Nuclear Security Administration (NNSA), establishes safety requirements for the proper packaging and transportation of offsite shipments and onsite transfers of radioactive and other hazardous materials, and for modal transportation.

2. CANCELLATION. DOE Order 460.1C, *Packaging and Transportation Safety*, dated 5-14-2010. Cancellation of a directive does not, by itself, modify or otherwise affect any contractual or regulatory obligation to comply with the directive. Contractor Requirements Documents (CRDs) that have been incorporated into a contract remain in effect throughout the term of the contract unless and until the contract or regulatory commitment is modified to either eliminate requirements that are no longer applicable or substitute a new set of requirements.

3. APPLICABILITY.

   a. Departmental Applicability. Except for the equivalencies/exemptions in paragraph 3.c., this Order applies to all Departmental elements which are involved in activities associated with the packaging and transportation of offsite shipments and onsite transfers of radioactive and other hazardous materials and modal transport.

      The Administrator of the National Nuclear Security Administration (NNSA) must assure that NNSA employees comply with their responsibilities under this directive. Nothing in this directive 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. Departmental Contractors. Except for the equivalencies/exemptions in paragraph 3.c., the Contractor Requirements Document (CRD) sets forth requirements of this Order that will apply to contracts that include the CRD.

      The CRD must be included in contracts that involve activities associated with the packaging and transportation of radioactive and other hazardous materials. The Heads of Operations Offices or Field Office/Site Office Managers identified in paragraph 5.c. are responsible for notifying the contracting officer of the contracts which are affected. Once notified, the contracting officer is responsible for incorporating the CRD into each affected contract via the laws, regulations, and DOE directives clause of the contract, or via negotiation and modification, as appropriate.

c. Exemptions/Equivalencies

An exemption from the requirements of this Order may be granted for DOE or NNSA packaging and transportation activities to the extent that an aspect is not regulated by the U.S. Nuclear Regulatory Commission (NRC), an Agreement State, or U.S. Department of Transportation (DOT), provided the proposed exemption:

- Is not prohibited by law;
- Does not present an undue risk to public health and safety, the environment, or workers; and
- Will achieve an equivalent level of safety to the requirements in this Order from which the activity is being exempted.

All applications for DOE or NNSA exemptions must contain information in accordance with 49 CFR 107.105(c) and (d).

DOE elements must submit their exemption applications through the Head of the responsible Operations Office or Field Office/Site Office Manager to the DOE Certifying Official (DOE CO) for final approval or disapproval. Central Technical Authority (CTA), ~~(~~or designee~~,)~~ concurrence is required for exemptions to this Order for DOE nuclear facilities in accordance with the DOE Order 410.1, *Central Technical Authority Responsibilities Regarding Nuclear safety Requirements*.

NNSA elements must submit their exemption applications through the Head of the responsible Operations Office or Field Office/Site Office Manager to the NNSA Certifying Official (NNSA CO) for final approval or disapproval. NNSA CTA (or designee) concurrence is required for exemptions to this Order for NNSA nuclear facilities.

All exemption decisions must be set forth in writing, including the reasons for granting or denying the exemption and, if granted, the basis for determining that the exempted activity is not prohibited by law; does not present an undue risk to public health and safety, the environment, or workers; and will achieve an equivalent level of safety to the requirements in this Order from which the activity is being exempted.

(1) Exemption. Operations conducted under DOE Order 461.1C, *Packaging and Transportation for Offsite Shipment of Materials of National Security Interest*, dated XX-XX-2015.

(2) Exemption. Operations conducted under DOE Order 461.2, *Onsite Packaging and Transfer of Materials of National Security Interest*, dated 11-01-2010.

(3) Exemption. Operations conducted under DOE Manual 441.1-1, *Nuclear Material Packaging Manual*, dated 11-18-2010.

(4) Exemption. Operations conducted under DOE Order 440.1C, *Aviation Management And Safety*, dated 06-05-2011.

(5) Exemption. Operations conducted under DOE Order 452. 2E, *Nuclear Explosive Safety*, dated 01-26-2015

(6) Equivalency. In accordance with the responsibilities and authorities assigned by Executive Order 12344, codified at 50 USC sections 2406 and 2511 and to ensure consistency through the joint Navy/DOE Naval Nuclear Propulsion Program, the Deputy Administrator for Naval Reactors (Director) will implement and oversee requirements and practices pertaining to this Directive for activities under the Director's cognizance, as deemed appropriate

4. REQUIREMENTS. The Department has broad authority under the Atomic Energy Act of 1954 (AEA), as amended, to regulate all aspects of activities involving radioactive materials that are undertaken by the Department or on its behalf, including the transportation of radioactive materials. In most cases that do not involve national security or other critical interests, the Department utilizes commercial carriers that undertake its shipments subject to regulation by DOT and NRC as appropriate. However, the Department exercises its AEA authority to regulate certain Departmental shipments, including shipments by government employees, and onsite transfers. In all cases, the Department's packaging and transportation activities must be conducted in a manner that achieves an equivalent level of safety to that required by DOT and NRC for comparable commercial shipments.

a. Offsite Safety.

(1) Packaging and Transportation Safety. Each Departmental element subject to this Order must perform packaging and transportation activities in accordance with the Department of Transportation (DOT) requirements of the Hazardous Materials Regulations (HMR) (49 CFR Parts 171-180).

(2) Requirements for Radioactive Material Packagings.

(a) Use of Type B or Fissile Materials Certified Packagings. Each Departmental element, when using a Type B or fissile material packaging with contents authorized by the Certificate of Compliance (CoC), as certified by the DOE CO, NNSA CO or the NRC, must:

1 Meet the conditions specified in the CoC for the packaging issued by the DOE CO, NNSA CO or NRC and

2 Prior to first use, register in writing with the DOE CO or the NNSA CO, as appropriate. For packagings certified by the NRC and for which neither DOE nor NNSA is the

certificate holder, DOE elements must register with the DOE CO, and NNSA elements must register with the NNSA CO.

(b) Use of DOT International Atomic Energy Agency (IAEA) Certified Packagings. For an import or an export shipment pursuant to 49 CFR 173.471, 173.472 or 173.473, each Departmental element must use a radioactive material package design certified by the U.S. Competent Authority (DOT) where:

1 The DOE or NNSA has been registered with the DOT as a user.

2 The element has the required documentation for the use and maintenance of the packaging and makes the shipments in accordance with the terms of the certificate issued by the DOT.

3 Prior to first use, DOE elements have registered in writing with the DOE CO, and NNSA elements have registered in writing with the NNSA CO.

(c) Application for NRC Certified Type B or Fissile Material Packagings, NRC Special Package Authorizations, or DOT-IAEA Special Form Certificate of Competent Authority (CoCA).

1 For a new NRC packaging certificate, or a NRC special package authorization (in accordance with 10 CFR 71.41(d)), or DOT-IAEA CoCA, DOE elements must file a request for a new certificate with the DOE CO, and NNSA elements must file a request for a new certificate with the NNSA CO.

2 When DOE or NNSA is the holder of a packaging certificate or special package authorization issued by the NRC or a DOT-IAEA CoCA, each Departmental element must file a request for revisions to or renewal of an existing NRC certificate or special package authorization or DOT-IAEA CoCA with the DOE CO or NNSA CO, as appropriate. Requests for renewal must be submitted to the DOE CO or NNSA CO at least 120 days prior to the expiration date.

3 In all cases the DOE CO or NNSA CO will review and forward, if appropriate, the request to the NRC or DOT, as applicable.

(d) Application for Departmental Type B or Fissile Materials Certified Packagings.

1 For a new Departmental Type B or fissile material packaging certificate, or a revision, renewal, or amendment to an existing certificate, Departmental elements must submit an application to the DOE CO or the NNSA CO, as appropriate to meet mission needs. The DOE CO and NNSA CO will ensure the applicant provides sufficient detail regarding the content and design to allow adequate evaluation to ensure compliance with requirements, ensure DOE and NNSA proposed contents are adequately addressed, and avoid issuing duplicate certificates.

2 The application must be supported by a Safety Analysis Report for Packaging (SARP). The SARP must adequately describe the proposed package in sufficient detail to identify the package accurately in accordance with 10 CFR 71.33 and provide a sufficient basis for evaluation of the package in accordance with 10 CFR 71.35. The application must also be supported by any other documentation needed to demonstrate the package meets the requirements of 10 CFR Part 71, Subparts D, E, F, G, and H, and any other applicable standards for certification.

(e) Preferred Use of Departmental Certified Packagings. Departmental elements must use Type B and fissile material packagings certified by the DOE CO or NNSA CO whenever possible, except as otherwise required by applicable law or regulations. In situations where an existing packaging is certified by the NRC and a Departmental element seeks to transport in that packaging Departmental contents other than those for which the NRC has certified the packaging, Departmental elements must submit an application for a new certificate to the DOE CO or the NNSA CO, as appropriate to meet mission needs.

(f) Expiration of Departmental Packaging Certificates.

1 CoCs issued by the DOE CO or NNSA CO are valid for 5 years and must be renewed, if still needed.

2 The Departmental element that is the holder of a DOE CoC must submit a request for renewal to the DOE CO at least 90 days prior to the certificate expiration date.

3 The Departmental element that is the holder of a NNSA CoC must submit a request for renewal to the NNSA CO at least 90 days prior to the certificate expiration date.

4 Certificates for which renewal applications have been submitted by the time frames specified in (f)2 and (f)3 above will not expire until the appropriate CO has reviewed and issued a decision on the renewal application.

(3) Quality Assurance.

(a) Each Departmental element that uses and/or performs design, testing, fabrication, procurement, inspection, operations or maintenance functions for Type B and fissile materials packagings must have and maintain a quality assurance (QA) program in accordance with 10 CFR Part 71, Subpart H that is approved by the NRC or approved by the DOE CO for DOE elements or by the NNSA CO for NNSA elements.

(b) Each Departmental element that uses and/or performs functions for all other radioactive and hazardous materials packagings must have, maintain and perform those operations under a DOE Order 414.1D compliant QA program approved by the responsible Head of Operations Office or Field Office/Site Office Manager.

(c) Fabrication, testing, use, or modification of a Type B or fissile material packaging certified by the DOE CO or the NNSA CO must not be initiated until the element's QA program is approved by the DOE CO for DOE elements or NNSA CO for NNSA elements. Departmental elements must notify the appropriate CO, in writing, 45 days in advance of starting fabrication of the first packaging under a Departmental CoC, to be used for the shipment of radioactive material which has either a decay heat load in excess of 5 kW; or a maximum normal operating pressure in excess of 103 kPa (15 lbf/in^2) gauge.

(d) QA programs approved by the DOE CO or NNSA CO are valid for 5 years and must be renewed, if still needed. The element must request renewal at least 30 days prior to the expiration date. QA programs for which renewal requests have been submitted by the time frames specified above will not expire until the appropriate CO has reviewed and issued a decision on the renewal request. Any revision, except spelling corrections and non-substantive changes to punctuation or editorial items, to a QA program approved by the DOE CO or NNSA CO must be

submitted to the DOE CO or NNSA CO, as appropriate, for approval.

(e) Deviations from the requirements of this Order must be reported as specified by DOE Order 232.2, Admin Chg 1, *Occurrence Reporting and Processing of Operations Information*.

(f) Deviations in the following areas must also be reported through the responsible Head of Operations Office or Field Office/Site Office Manager to the DOE CO for DOE elements and to the NNSA CO for NNSA elements within 30 days:

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

2 any discovery of any defects with safety significance in Type B or fissile material packaging after first use, with details of the means employed to mitigate the effects of the defects, and

3 any instances in which the conditions of approval in the CoC were not observed in making a shipment.

(g) Prior written approval is needed from the DOE CO or NNSA CO, as appropriate, for any corrective actions planned as a result of a deviation described in paragraphs 4.a.(3)(f) 1 and 2, including the means to be employed to repair any defects and actions to be taken to reduce the probability of similar events occurring in the future.

(4) International Shipments. For use of the International Civil Aviation Organization's (ICAO) *Technical Instructions,* International Maritime Organization's (IMO) *International Maritime Dangerous Goods (IMDG) Code*, Transport Canada's *Transportation of Dangerous Goods Regulations*, and/or IAEA's *Regulations for the Safe Transport of Radioactive Material (SSR-6)* for domestic segments of international transportation, the requirements of 49 CFR 171.22 to 171.26 must be followed.

b. Onsite Safety. Onsite transfer of hazardous materials, substances, and wastes must be conducted in accordance with the following:

(1) 49 CFR Parts 171-180 and the relevant federal regulations governing each mode of transportation, or

(2) A Transportation Safety Document (TSD) approved by the Head of Operations Office or Field Office/Site Office Manager, as appropriate.

(a) The TSD must describe the methodology and compliance process to meet equivalent safety for any deviation from 49 CFR Parts 171-180 and 49 CFR Parts 350-399.

(b) For onsite transfers subject to 10 CFR Part 830, Subpart B (transportation activities involving nuclear facility Hazard Category 2 or 3 quantities), the TSD must comply with the requirements of 10 CFR 830.204 for the preparation of a Documented Safety Analysis, and the requirements of 10 CFR 830.205 for the preparation of Technical Safety Requirements, to identify the conditions, safe boundaries, and hazard controls necessary to protect workers, the public, and the environment from adverse consequences.

(c) For multiple-tenant DOE/NNSA sites, transportation safety documents for several contractor organizations may be combined into a single TSD.

(3) QA requirements in Order 414.1D, *Quality Assurance*, and 10 CFR Part 830, as appropriate.

c. Motor Vehicle Safety Requirements. All transportation of hazardous materials by motor vehicle must be conducted in accordance with the requirements in 49 CFR Parts 40 and 350-399.

d. Pipeline Safety Requirements. All transportation of hazardous materials by pipeline must be conducted in accordance with 49 CFR Parts 190-193, 195, and 199.

e. Railroad Safety Requirements. All transportation of hazardous materials by rail must be conducted in accordance with 49 CFR Parts 200-268.

f. Special Permits.

(1) Any offsite hazardous materials packaging or transportation that is regulated by DOT and is not prepared in accordance with the HMR must be prepared in accordance with an applicable DOT Special Permit.

(2) DOE elements must submit contractor applications for a new DOT Special Permit or renewal of or an amendment to an existing Special Permit to the DOE CO for review, processing, and submission to DOT. NNSA elements must submit contractor applications for a new DOT special permit or renewal or an amendment to existing Special Permit to the NNSA CO for review, processing, and submission to DOT. Applications must be prepared in accordance with 49 CFR 107.105, 107.107 and 107.109, as appropriate.

g. Training. Each Departmental element that offers for transportation, transports or transfers hazardous materials, substances and wastes must:

(1) Ensure that all personnel who support and/or perform packaging, transfer and transportation operations are appropriately trained and qualified; and

(2) Maintain auditable training records in accordance with approved DOE or NNSA or site-specific records schedule.

h. Lessons Learned. Departmental elements will share packaging and transportation safety successes, problems, causal analysis and corrective actions with other Departmental elements through the use of the Department's lessons learned program under the Operating Experience Program.

5. RESPONSIBILITIES.

a. DOE Certifying Official (DOE CO).

(1) Administers the DOE program for certification of fissile material and Type B packages.

(a) Provides guidance for the preparation of SARPs. For guidance go to https://rampac.energy.gov/home/doe-certification-review-docket/sarp-requirements

(b) Reviews SARPs submitted in support of DOE CoC applications, and any other supporting documentation, to determine whether the proposed packaging meets the requirements specified in 10 CFR Part 71, Subparts E, F, G, & H, and any other applicable standards for certification prior to approval.

(c) Issues DOE CoCs to certify DOE Type B and/or fissile material packagings. The DOE CoC and supporting DOE CO approved documents provide the written approval of the packaging designs and authorize the use of the packagings for offsite shipment.

(d) Reviews and recertifies DOE packagings by issuing CoC revisions in writing.

(e) Curtails and suspends the use of specific DOE CO certified packagings, if warranted.

(2) Coordinates DOE elements input and works jointly with NNSA CO to establish and maintain packaging standards for the transportation of hazardous materials, substances and wastes.

(3) Supports the development, adoption and use of voluntary consensus standards through topical committees within the Department's Technical Standards Program.

(4) Reviews and processes DOE contractor applications for new DOT Special Permits or renewal of or an amendment to an existing Special Permit and submits the applications to DOT.

(5) Reviews and grants or denies requests for exemptions to DOE elements from the requirements of this Order, with concurrence from the CTA as appropriate.

(6) Reviews DOE element requests and supporting documents for DOT-IAEA certificates of competent authority (CoCAs) for special form radioactive materials certification, and/or competent authority certificates (CACs) for Type B and fissile material package certification, and for NRC CoCs and submits requests and supporting documents to the DOT or NRC, as applicable.

(7) Provides technical assistance and training for packaging and transportation safety matters.

(8) Provides the Departmental point of coordination and works jointly with NNSA CO to ensure consistency in the Departmental review, participation in, and comments on international, Federal, State, local, and tribal regulations and other matters relating to packaging and transportation safety.

(9) Develops Departmental policy and guidance in consultation with the NNSA CO and other Departmental elements for transportation and packaging safety of hazardous materials, substances and wastes, and assists DOE elements and contractors on related matters.

(10) Audits DOE elements utilizing DOE, NNSA, or NRC issued CoCs and DOT issued CoCAs and/or CACs as necessary for compliance with the packaging QA program and the requirements of 10 CFR Part 71, Subpart H.

(11) Reviews and approves packaging QA programs of DOE elements and contractors for Type B and fissile materials packagings in accordance with 10 CFR Part 71, Subpart H and ensures that related functions are performed in accordance with the approved QA program. Approves corrective actions, including the means to be employed to repair any defects and actions to be taken to reduce the probability of similar events occurring in the future, in response to reports of deviations.

(12) Ensures maintenance of DOE package certification and QA program records related to reviews, approvals, and requests to the DOE CO (e.g.,

DOE, NRC, and DOT certificates, DOE Exemptions, DOT Special Permits).

(13) Supports the sharing of packaging and transportation safety successes, problems, and corrective actions with other DOE elements and the field through the use of the Department's lessons learned program within the Operating Experience Program.

b. NNSA Certifying Official (NNSA CO).

(1) Administers the NNSA program for NNSA certification of fissile material and Type B packagings.

(a) Provides guidance for the preparation SARPs.

(b) Reviews SARPs submitted in support of NNSA CoC applications, and any other supporting documentation, to determine if the packaging meets the regulatory requirements specified in 10 CFR Part 71, Subparts E, F, G, & H, and any other applicable standards for certification prior to approval.

(c) Issues NNSA CoCs to certify NNSA Type B and/or fissile material packagings. The NNSA CoC and supporting NNSA CO approved documents provide the written approval of the packaging designs and authorizes the use of the packaging for offsite shipment.

(d) Reviews and recertifies NNSA packagings by issuing CoC revisions in writing.

(e) Curtails and suspends the use of specific NNSA packagings, if warranted.

(2) Coordinates NNSA elements input and works jointly with DOE CO to establish and maintain packaging standards for the transportation of hazardous materials, substances and wastes.

(3) Supports the development, adoption and use of voluntary consensus standards through a topical committee within the Department's Technical Standards Program.

(4) Reviews and processes NNSA contractor applications for new DOT Special Permits or renewal of or an amendment to an existing Special Permit and submits the applications to DOT.

(5) Reviews and grants or denies requests for exemptions to NNSA elements from the requirements of this Order, with concurrence from the NNSA CTA as appropriate.

(6) Reviews NNSA element requests and supporting documents for DOT-IAEA CoCAs for special form radioactive materials certification or CACs for Type B and fissile material packaging certification and NRC CoCs and submits requests to the DOT or NRC, as applicable.

(7) Provides technical assistance and training for packaging and transportation safety matters.

(8) Provides the NNSA point of coordination and works jointly with DOE CO to ensure consistency in the Departmental review of, participation in, and comments on international, Federal, State, local, and tribal regulations and other matters relating to packaging and transportation safety.

(9) Develops supplemental policy and guidance for NNSA transportation and packaging safety of hazardous materials, substances and wastes, and assists NNSA elements and contractors on related matters.

(10) Audits NNSA elements utilizing DOE, NRC and NNSA issued CoCs and DOT issued CoCAs and/or CACs for compliance with the packaging QA program and the requirements of 10 CFR Part 71, Subpart H.

(11) Reviews and approves packaging QA programs of NNSA elements and contractors for Type B and fissile materials packagings in accordance with 10 CFR Part 71, Subpart H and ensures that related functions are performed in accordance with the approved QA program. Approves corrective actions, including the means to be employed to repair any defects and actions to be taken to reduce the probability of similar events occurring in the future, in response to reports of deviations.

(12) Ensures maintenance of NNSA package certification and QA program records related to reviews, approvals, and requests to the NNSA CO (e.g., NNSA, NRC, and DOT certificates, NNSA Exemptions, DOT Special Permits).

(13) Supports the sharing of packaging and transportation safety successes, problems, root cause analysis and corrective actions with other NNSA elements and the field through the use of the Department's lessons learned program within the Operating Experience Program.

c. Heads of Operations Offices or Field Office/Site Office Managers.

(1) Implement the requirements of this Order and ensure that contractors under their purview fully implement and comply with the requirements of the CRD in this Order.

(2) Review and approve, in writing, onsite TSDs.

(3) Review and submit to the DOE CO for DOE elements and contractors or to the NNSA CO for NNSA elements and contractors requests for exemptions, DOT-IAEA CoCAs or CACs, DOT Special Permits and renewals, and NRC CoCs.

(4) Review and submit SARPs to the DOE CO or NNSA CO, as appropriate to meet mission needs.

(5) Notify the contracting officer of which site/facility management contracts are affected by this order and ensure that the contracting officer incorporates the CRD into the contract.

(6) Support the sharing of packaging and transportation safety successes, problems, root cause analysis and corrective actions with other DOE and NNSA elements as part of the Department's lessons learned program within the Operating Experience Program.

(7) Obtain waivers from tribal, State, and local transportation laws, rules, and regulations, as needed to meet safety requirements. Provide copies of all such requests and waivers to the responsible Secretarial Officer/Deputy Administrator and the DOE CO or NNSA CO.

(8) Review and process packaging QA programs for Type B and fissile materials packagings for conformance with 10 CFR Part 71, Subpart H and submit to the DOE CO, for DOE elements and contractors, or the NNSA CO, for NNSA elements and contractors, for approval.

(9) Review and approve QA programs, developed to satisfy the requirements of DOE Order 414.1D, Quality Assurance, that address transportation and packaging for radioactive and hazardous materials, other than certified Type B and fissile materials packagings.

(10) Report to the DOE CO or NNSA CO, as appropriate, within 30 days of any instance of significant reduction in the effectiveness of any approved Type B or fissile material packaging during use; any discovery of a defect with safety significance in Type B or fissile material packaging after first use, with details of the means employed to mitigate the effects of the defects; or any instances where the conditions of approval in the CoC were not observed in making a shipment. If the deviation is related to a NRC-certified packaging, then transmit the report to NRC in accordance with 10 CFR 71.95 and provide copies to the DOE CO or NNSA CO. Submit for approval a description of any corrective actions planned, including means to be employed to repair any defects and actions to be taken to reduce the probability of similar events occurring in the future, for any instance of a significant reduction in the effectiveness of the packaging during use, or the discovery of any defect with safety significance in the packaging after first use. Ensure

that reporting is performed in accordance with DOE Order 232.2, Admin Chg 1, *Occurrence Reporting and Processing of Operations Information*.

(11) Conduct oversight of hazardous materials packaging and transportation activities, including contractor/subcontractor procurement, use and maintenance of industrial packaging (IP), Type A and Type B packagings of radioactive and fissile material for compliance with appropriate regulatory requirements and DOE Orders pursuant to DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*.

d. Central Technical Authority (CTA) or designee. Concurs on exemptions to this Order for Departmental nuclear facilities in accordance with DOE Order 410.1, *Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements*.

6. REFERENCES.

a. 10 CFR Part 71, Packaging and Transportation of Radioactive Material, Nuclear Regulatory Commission.

b. 10 CFR Part 830, Nuclear Safety Management, Department of Energy.

c. 49 CFR Part 107, Hazardous Materials Program Procedures, Pipeline and Hazardous Materials Safety Administration, Department of Transportation.

d. 49 CFR Parts 171-180, Hazardous Materials Regulations, Pipeline and Hazardous Materials Safety Administration, Department of Transportation.

e. 49 CFR Parts 190-199, Pipeline Safety, Pipeline and Hazardous Materials Safety Administration, Department of Transportation.

f. 49 CFR Parts 200-268, Federal Railroad Administration, Department of Transportation.

g. 49 CFR Parts 40, 350-399, Federal Motor Carrier Safety Administration, Department of Transportation.

h. Title XXXII of P.L. 106-65, National Nuclear Security Administration Act, as amended, which established a separately organized agency within the Department of Energy.

i. DOE Order 210.2A, *DOE Corporate Operating Experience Program*, dated 4-8-11.

j. DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, dated 4-25-11.

k. DOE Order 232.2, Admin Chg 1, *Occurrence Reporting and Processing of Operations Information*, dated 03-12-14.

l. DOE Order 410.1, *Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements*, dated 08-28-07.

m. DOE Order 414.1D, Admin Chg 1, *Quality Assurance*, dated 4-25-11.

n. DOE Order 452.2E, *Nuclear Explosive Safety*, dated 1-26-2015.

o. DOE Order 461.1C, *Packaging and Transportation for Offsite Shipment of Materials of National Security Interest*, dated XX-XX-2015.

p. DOE Order 461.2, *Onsite Packaging and Transfer of Materials of National Security Interest*, dated 11-01-2010.

q. DOE-STD-1212-2012, *Explosives Safety*, dated 7-27-2015.

7. DEFINITIONS. See Attachment 2 for definitions applicable to this Order.

8. ACRONYMS. See Attachment 3 for acronyms used in this Order.

9. CONTACT. Questions concerning this Order should be addressed to the DOE Office of Packaging and Transportation at AskPat@em.doe.gov

BY ORDER OF THE SECRETARY OF ENERGY:

ELIZABETH SHERWOOD-RANDALL
Deputy Secretary

CONTRACTOR REQUIREMENTS DOCUMENT
DOE O 460.1D, *Hazardous Materials Packaging and Transportation Safety*

Regardless of the performer of the work, the contractor is responsible for complying 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 contractor's compliance with the requirements.

1. This CRD establishes requirements for DOE and NNSA contractors whose contracts implicitly or explicitly involve packaging or transportation of DOE and/or NNSA offsite shipments and onsite transfers of radioactive and other hazardous materials, and for modal transport. In addition to the requirements set forth in this CRD, contractors are responsible for complying with Attachments 2 and 3 to DOE Order 460.1D referenced in and made a part of this CRD and which provide program requirements and/or information applicable to contracts in which this CRD is inserted. To the extent the contractor is regulated by the Nuclear Regulatory Commission (NRC), a state under an agreement with the NRC (Agreement State), or Department of Transportation (DOT), nothing in this CRD relieves the contractor of having to comply with any applicable regulatory requirements.

2. The contractor must perform onsite hazardous materials transfers in accordance with 49 CFR Parts 100-180 and the relevant federal regulations governing each mode of transportation, or the site- or facility-specific Operations or Field Office/Site Office approved Transportation Safety Document (TSD) that describes the methodology and compliance process to meet equivalent safety for any deviation from the requirements of 49 CFR Parts 100-180 and 49 CFR Parts 350-399. For onsite transfers subject to 10 CFR Part 830, Subpart B (transportation activities involving nuclear facility Hazard Category 2 or 3 quantities), the TSD must comply with the requirements of 10 CFR 830.204 for the preparation of a Documented Safety Analysis, and the requirements of 10 CFR 830.205 for the preparation of Technical Safety Requirements to identify the conditions, safe boundaries, and hazard controls necessary to protect workers, the public, and the environment from adverse consequences.

3. The contractor must perform offsite packaging and transportation activities in accordance with 49 CFR Part 40; 49 CFR Parts 100-180 for transportation of hazardous materials generally; 49 CFR Parts 350-399 for transporting hazardous materials by motor vehicle; 49 CFR Parts 200-268 for rail operations; and 49 CFR Parts 190-193, 195, and 199 for transportation of hazardous materials by pipeline.

4. For specific radioactive material packagings for offsite shipments, the following apply:

    a. Each contractor, when using a Type B or fissile material packaging with contents authorized by the Certificate of Compliance (CoC), as certified by the DOE Certifying Official (DOE CO), NNSA Certifying Official (NNSA CO) or the U.S. Nuclear Regulatory Commission (NRC), must meet the conditions specified in the CoC for the packaging issued by the DOE CO, NNSA CO, or NRC. DOE

contractors must register in writing with the DOE CO and NNSA contractors must register in writing with the NNSA CO prior to first use. For packagings certified by the NRC and for which neither DOE nor NNSA is the certificate holder, DOE contractors must register with the DOE CO, and NNSA contractors must register with the NNSA CO. The DOE Radioactive Material Packaging (RAMPAC) website (https://rampac.energy.gov/) is provided as a source of information and guidance.

b. For an import or an export shipment pursuant to 49 CFR 173.471, 173.472 or 173.473, each contractor must use a radioactive material packaging certified by the U.S. Competent Authority (DOT) where the DOE or NNSA has been registered with the DOT as a user, and the contractor has the required documentation for the use and maintenance of the packaging and makes the shipments in accordance with the terms of the certificate issued by the DOT. DOE contractors must register in writing with the DOE CO and NNSA contractors must register in writing with NNSA CO prior to the first use.

c. For an application to NRC for a new Type B or fissile material packaging certificate; revision, renewal, or amendment to an existing NRC certificate where DOE or NNSA is the certificate holder; application to NRC for Special Package Authorization in accordance with 10 CFR 71.41(d); application for a DOT-International Atomic Energy Agency (IAEA) certificate of competent authority (CoCA); or application to DOT for a new Special Permit or renewal of or an amendment to existing Special Permit in accordance 49 CFR Part 107, Subpart B, the contractor must submit a request with the responsible Head of the Operations Office or the Field Office/Site Office Manager for processing through the DOE CO or NNSA CO, as appropriate. Requests for renewal must be submitted at least 120 days prior to the certificate expiration date for processing through the DOE CO or NNSA CO, as appropriate.

d. For a new Type B or fissile material packaging certificate from the DOE CO or NNSA CO, or a revision, renewal, or amendment to an existing certificate, each contractor must submit an application to the responsible Head of the Operations Office or the Field Office/Site Office Manager for processing through the DOE CO or NNSA CO, as appropriate to meet mission needs. The application must include a Safety Analysis Report for Packaging (SARP) which must adequately describe the proposed package in sufficient detail to identify the package accurately in accordance with 10 CFR 71.33 and provide a sufficient basis for evaluation of the package in accordance with 10 CFR 71.35. The application must also be supported by any other documentation needed to demonstrate that the packaging meets the requirements of 10 CFR Part 71, Subparts E, F, G, and H, and any other applicable standards for certification prior to use. Requests for renewal must be submitted at least 90 days prior to the certificate expiration date for processing through the DOE CO or NNSA CO, as appropriate to meet mission needs.

e. Contractors must use Type B and fissile material packagings certified by the DOE CO or NNSA CO whenever possible, except as otherwise required by applicable law or regulations. In situations where an existing packaging is certified by the NRC and the contractor seeks to transport in that packaging Departmental contents other than those for which the NRC has certified the packaging, DOE contractors must submit an application for a new certificate to the responsible Head of the Operations Office or the Field Office/Site Office Manager for processing through the DOE CO or NNSA CO, as appropriate to meet mission needs.

5. The contractor must report to the responsible Head of the Operations Office or the Field Office/Site Office Manager within 30 days of any instance of significant reduction in the effectiveness of any approved Type B or fissile material packaging during use; any discovery of any defects with safety significance in Type B or fissile material packaging after first use, with details of the means employed to mitigate the effects of the defects; or any instances where the conditions of approval in the CoC were not observed in making a shipment. The contractor must receive prior written approval from the DOE CO or NNSA CO, as appropriate, for any corrective actions planned for any instance of a significant reduction in the effectiveness of the packaging during use or the discovery of any defects with safety significance in the packaging after first use, including the means to be employed to repair any defects and actions to be taken to reduce the probability of similar events occurring in the future. Contractors must report to the NRC in accordance with 10 CFR 71.95 if using an NRC approved packaging and provide a copy of that notification to the responsible Head of the Operations Office or the Field Office/Site Office Manager. The contractor must prepare the report in accordance with the CRD to DOE Order 232.2, Admin Chg 1, *Occurrence Reporting and Processing of Operations Information*, or the successor Orders, as established in its contract.

6. The contractor, when participating in the design, testing, fabrication, procurement, inspection, use, operations or maintenance of hazardous materials packaging, must have and maintain a QA program approved by:

a. The NRC or the DOE CO or the NNSA CO, as appropriate, for certified Type B and fissile materials packagings satisfying the requirements of 10 CFR Part 71, Subpart H, Quality Assurance, or

b. The responsible Head of Operations Office or Field Office/Site Office Manager, as appropriate, for all other radioactive and hazardous materials packagings satisfying the requirements of the CRD to DOE Order 414.1D, or its successor, as found in its contract.

7. The contractor must submit a renewal request to the responsible Head of Operations Office or Field Office/Site Office Manager for processing through the appropriate CO for an expiring QA program that was approved by the DOE CO or NNSA CO at least 30 days prior to the expiration date, if still needed. QA programs for which renewal requests have been submitted within the appropriate timeframe will not expire until the appropriate CO has reviewed and issued a decision on the renewal request. Any revision, except spelling corrections and non-substantive changes to punctuation or editorial items, to a QA program approved by the DOE CO or NNSA CO must be submitted for approval.

8. For use of the International Civil Aviation Organization's (ICAO) *Technical Instructions*, the International Maritime Organization's (IMO) *International Maritime Dangerous Goods (IMDG) Code*, Transport Canada's *Transportation of Dangerous Goods Regulations*, and/or the IAEA's *Regulations for the Safe Transport of Radioactive Material (SSR-6)* for domestic segments of international transportation, the contractor must also meet the requirements of 49 CFR Part 171.22 to 171.26.

9. If the contractor is subject to the Hazardous Materials Regulations (HMR) and wishes to prepare and/or conduct an offsite shipment that is not in accordance with the HMR, then the contractor must apply for a DOT Special Permit. New applications for a Special Permit or renewal of or an amendment to an existing Special Permit must be submitted to the responsible Head of Operations Office or the Field Office/Site Office Manager for processing through the DOE CO or NNSA CO, as appropriate, to DOT. Applications must be prepared in accordance with 49 CFR 107.105, 107.107 and 107.109, as appropriate. Applications for Party Status to an existing Special Permit may be submitted directly to DOT. The contractor must provide a copy of the application to the responsible Head of Operations Office or Field Office/Site Office Manager and the DOE CO or NNSA CO, as appropriate.

10. If the contractor is not otherwise subject to the HMR and wishes to conduct activities that are not in accordance with the requirements of this CRD, then the contractor must apply for a DOE or NNSA exemption to the responsible Head of Operations Office or the Field Office/Site Office Manager for processing through the DOE CO or NNSA CO for final approval or disapproval. Applications for DOE or NNSA exemptions must contain information in accordance with 49 CFR 107.105(c) and (d).

11. The contractor must share packaging and transportation safety successes, problems, causal analysis and corrective actions with other Departmental elements through the use of the Department's lessons learned program under the Operating Experience Program.

12. The contractor, when preparing for and transporting, or transferring hazardous materials, substances and wastes, must ensure that all personnel who support and/or perform packaging, transfer and transportation operations are appropriately trained and qualified; and maintain auditable training records in accordance with approved DOE or NNSA or site-specific record retention requirements.

This Attachment provides information and/or requirements associated with DOE Order 460.1D as well as information and/or requirements applicable to contracts in which the associated CRD (Attachment 1 to DOE Order 460.1D) is inserted.

DEFINITIONS

1. Certificate of Compliance (CoC). The certificate issued by the NRC, the DOE Certifying Official (CO), or the NNSA CO which approves the design of a package/packaging for the transportation of radioactive material. CoCs are issued for packages (packaging and contents) that are evaluated, approved, and certified to meet the packaging standards specified in 10 CFR Part 71 or equivalent standards.

2. Department/Departmental. All elements, programs, offices, and organizational units of the Department of Energy, including the National Nuclear Security Administration.

3. DOE Elements. Programs, operations offices, field/site offices, and other organizational units of the Department of Energy, excluding those of the National Nuclear Security Administration.

4. Exemption. A waiver of the need to comply with specific requirements defined in this Order. An exemption to provisions of this Order is granted in writing by the DOE CO for DOE elements or the NNSA CO for NNSA elements.

5. Fissile Material. Uranium-233, uranium-235, plutonium-239, and plutonium-241, or any combination of these radionuclides. Fissile material means the fissile nuclides themselves, not material containing fissile nuclides. Unirradiated natural uranium and depleted uranium and natural uranium or depleted uranium that has been irradiated in thermal reactors only, are not included in this definition. Certain exclusions from fissile material controls are provided in 10 CFR 71.15.

6. Hazardous Materials. A substance or material that the Secretary of the Department of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (see 49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in 49 CFR Part 173.

7. Modal Transport. Transportation by any of the following methods: rail, highway, air, or water.

8. National Security. A category of activities or materials that may affect the security of the United States and its citizens.

9. NNSA Elements. Programs, operations offices, field/site offices, and other organizational units of the National Nuclear Security Administration.

10. Offsite. Any area within or outside the boundaries of a DOE site or facility to which the general public has free and uncontrolled access.

11. Onsite. Any area within the contiguous (i.e., touching, unbroken, continuous) boundaries of a DOE site or facility to which public access is controlled or restricted. Where a public road or railroad track traverses a contiguous DOE site or facility, the area may be temporarily considered and treated as onsite for the purposes of transportation only during such time that public access to the area is effectively restricted by signals, lights, gates, guards, or similar controls.

12. Onsite Transfer. An onsite transportation activity involving hazardous materials, which includes the package and transport conveyance (via highway or rail), that occurs within a DOE site or facility.

13. Package. Package means a packaging plus its authorized contents. For radioactive materials, package means the packaging together with its radioactive contents as presented for transport.

14. Packaging. Packaging means a receptacle and any other components or materials necessary for the receptacle to perform its containment function in conformance with the requirements of the DOT Hazardous Materials Regulations. For radioactive materials, packaging means the assembly of components necessary to ensure compliance with the packaging requirements in 49 CFR Part 173, Subpart I. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, service equipment for filling, emptying, venting and pressure relief, and devices for cooling or absorbing mechanical shocks. The conveyance, tie-down system, and auxiliary equipment may sometimes be designated as part of the packaging.

15. Quality Assurance. All those planned and systematic actions necessary to provide adequate confidence that a system or component will perform satisfactorily in service. Quality assurance includes quality control, which comprises those quality assurance actions related to control of the physical characteristics and quality of the material or component to predetermined requirements. Quality assurance requirements apply to design, fabrication, testing, modification, and use of a packaging.

16. 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 49 CFR 173.436 or values derived according to the instructions in 49 CFR 173.433.

17. Safety Analysis Report for Packaging (SARP). A safety document (application) prepared by a Departmental element or contractors that describes and evaluates the proposed packaging and contents to be reviewed by appropriate DOE elements or NNSA elements, and serves as the basis for DOE CO or NNSA CO issuing a Certificate of Compliance. A SARP contains nine chapters: Chapter 1 General Information, Chapter 2 Structural Evaluation, Chapter 3 Thermal Evaluation, Chapter 4 Containment, Chapter 5 Shielding Evaluation, Chapter 6 Criticality Evaluation, Chapter 7 Package Operations, Chapter 8 Acceptance Tests and Maintenance Programs, and Chapter 9 Quality Assurance.

18. Use/User. The use of certified Type B and fissile material package and packaging includes all package operations, acceptance testing, and maintenance in accordance with the requirements in Chapters 7 and 8 of the SARP and the CoC.

This Attachment provides information and/or requirements associated with DOE Order 460.1D as well as information and/or requirements applicable to contracts in which the associated CRD (Attachment 1 to DOE Order 460.1D) is inserted.

ACRONYMS

CAC	Competent Authority Certificate
CFR	Code of Federal Regulations
CoC	Certificate of Compliance
CoCA	Certificate of Competent Authority
CRD	Contractor Requirements Document
CTA	Central Technical Authority
DOE CO	Department of Energy Certifying Official
DOT	Department of Transportation
HMR	Hazardous Materials Regulations
IAEA	International Atomic Energy Agency
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
NNSA	National Nuclear Security Administration
NNSA CO	National Nuclear Security Administration Certifying Official
NRC	Nuclear Regulatory Commission
P.L.	Public Law
QA	Quality Assurance
SARP	Safety Analysis Report for Packaging
TSD	Transportation Safety Document