



Department of Energy
Washington, DC 20585

SEP 13 2016

MEMORANDUM FOR JAMES L. JOYCE
PROJECT MANAGER, AMWTP FUTURE MISSION TEAM
NATIONAL TRU PROGRAM OVERSIGHT OFFICE, EM-4.21

FROM: JOANNE LORENCE *Joanne Lorence*
HEADQUARTERS CERTIFYING OFFICIAL
DIRECTOR
OFFICE OF PACKAGING AND TRANSPORTATION

SUBJECT: DOE Certificate of Compliance for the Model TRUPACT-II

In response to your email request to Dr. James Shuler of my staff dated August 8, 2016, attached is Department of Energy (DOE) Certificate of Compliance (CoC) Number 9218, Revision 0 and its Package Certification Approval Record. DOE CoC 9218 is based on endorsement of the Nuclear Regulatory Commission (NRC) CoC 9218, Revision 22. DOE CoC 9218 authorizes use of the TRUPACT-II package for DOE site-to-site shipments, but is not authorized for DOE shipments to the Waste Isolation Pilot Plant (WIPP). Only the NRC CoC authorizes use of the TRUPACT-II for WIPP shipments.

This CoC is issued under the authority of 49 CFR 173.7(d) and is conditional upon fulfilling the applicable Operational and Quality requirements of 49 CFR Part 100-199 and 10 CFR Part 71, and the conditions specified in Item 5 of the CoC.

The expiration date of Revision 0 is August 31, 2019, and coincides with the expiration of NRC CoC 9218.

If you have any questions, please contact me or Dr. James M. Shuler of my staff at (301) 903-5513.

Attachments

cc: James Shuler, EM-4.24
James C. Rhoades, CFO





**CERTIFICATE OF COMPLIANCE
For Radioactive Materials Package**

1a. Certificate Number 9218	1b. Revision No. 0	1c. Package Identification No. USA/9218/B(U)F-96 (DOE)	1d. Page No. 1	1e. Total No. Pages 5
---------------------------------------	------------------------------	--	--------------------------	---------------------------------

2. PREAMBLE

- 2a. This certificate is issued under the authority of 49 CFR Part 173.7(d).
- 2b. The packaging and contents described in Item 5 below meet the safety standards set forth in subpart E, "Package Approval Standards" and subpart F, "Package, Special Form, and LSA III Tests" Title 10, Code of Federal Regulations, Part 71.
- 2c. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. This certificate is issued on the basis of a safety analysis report of the package design or application — (1) Prepared by (Name and Address): U.S. Department of Energy Carlsbad Field Office P.O. Box 3090 Carlsbad, NM 88221-2078	(2) Title and identification of report or application: TRUPACT-II Safety Analysis Report Revision 23	(3) Date: March 2013
--	--	-------------------------

4. CONDITIONS

This certificate is conditional upon fulfilling of the applicable Operational and Quality Assurance requirements of 49CFR parts 100 – 199 and 10CFR Part 71, and the conditions specified in Item 5 below.

5. Description of Packaging and Authorized Contents, Model Number, Transport Index, other Conditions, and References:

(a) Packaging

(1) Model Number: TRUPACT-II

(2) Description:

A stainless steel and polyurethane foam insulated shipping container designed to provide single containment for shipment of contact-handled transuranic waste. The packaging consists of an unvented, ¼-inch thick stainless steel inner containment vessel (ICV), positioned within an outer confinement assembly (OCA) consisting of an unvented ¼-inch thick stainless steel outer confinement vessel (OCV), a 10-inch thick layer of polyurethane foam and a ¼ to ⅜ inch thick outer stainless steel shell. The package is a right circular cylinder with outside dimensions of approximately 94 inches diameter and 122 inches height. The package weighs not more than 19,250 pounds when loaded with the maximum allowable contents of 7,265 pounds.

The OCA has a domed lid, which is secured to the OCA body with a locking ring. Although not part of the containment boundary, the OCV confinement seal is provided by an optional butyl rubber O-ring (bore seal). The OCV is equipped with a seal test port and a vent port.

6a. Date of Issuance: 9/13/2016	6b. Expiration Date: August 31, 2019
---------------------------------	--------------------------------------

FOR THE U.S. DEPARTMENT OF ENERGY

7a. Address (of DOE Issuing Office) U.S. Department of Energy Office of Packaging and Transportation, EM-33 1000 Independence Avenue, SW Washington, DC 20585	7b. Signature, Name, and Title (of DOE Approving Official) Joanne Lorence Headquarters Certifying Official Director Office of Packaging and Transportation
---	--

Certificate Number	Revision No.	Package Identification No.	Page No.	Total No. Pages
9218	0	USA/9218/B(U)F-96 (DOE)	2	5

The ICV is a right circular cylinder with domed ends. The outside dimensions of the ICV are approximately 73 inches diameter and 98 inches height. The ICV lid is secured to the ICV body (2) with a locking ring. The ICV containment seal is provided by a butyl rubber O-ring (bore seal). The ICV is equipped with a seal test port and vent port. Aluminum spacers are placed in the top and bottom domed ends of the ICV during shipping. The cavity available for the contents is a cylinder of approximately 73 inches diameter and 75 inches height.

(3) Drawings:

The packaging is constructed in accordance with Washington TRU Solutions, LLC, Drawing No. 2077-500 SNP, sheets 1-11, Rev. Y. The contents are positioned within the packaging in accordance with the Contact-Handled Transuranic Waste Authorized Methods for Payload Control (CH-TRAMPAC), Rev. 4, Section 2.9, *Payload Container/Assembly Configuration Specifications*. The standard pipe overpack is constructed and assembled in accordance with Washington TRU Solutions, LLC, Drawing No. 163-001, sheets 1-3, Rev. 7. The S100 pipe overpack is constructed and assembled in accordance with Washington TRU Solutions, LLC, Drawing No. 163-002, sheets 1 and 2, Rev. 5. The S200 pipe overpack is constructed and assembled in accordance with Washington TRU Solutions, LLC, Drawing No. 163-003, sheets 1 and 2, Rev. 4. The S300 pipe overpack is constructed and assembled in accordance with Washington TRU Solutions, LLC, Drawing No. 163-004, Rev. 2. The compacted puck drum spacers needed for the purpose of maintaining subcriticality in 55-, 85-, and 100-gallon drums are constructed and assembled in accordance with Washington TRU Solutions, LLC, Drawing No. 163-006, Rev. 1. The criticality control overpack is constructed and assembled in accordance with Washington TRU Solutions, LLC, Drawing No. 163-009, sheets 1 and 2, Rev. 0.

(b) Contents

(1) Type and form of material:

Dewatered, solid or solidified transuranic and tritium-contaminated materials and wastes. Materials must be packaged in one of the following payload containers: a 55-gallon drum, an 85-gallon drum, a 100-gallon drum, a standard waste box (SWB), a standard pipe overpack, an S100 pipe overpack, an S200 pipe overpack, an S300 pipe overpack, ten-drum overpack (TDOP) or criticality control overpack (CCO). The payload containers are described in CH-TRAMPAC, Rev. 4, Section 2.9, *Payload Container/Assembly Configuration Specifications*. Materials must be restricted to prohibit explosives, corrosives, nonradioactive pyrophorics and compressed gases. Within a payload container, radioactive pyrophorics must not exceed 1 percent by weight, and residual liquids must not exceed 1 percent by volume. Flammable organics and methane are limited along with hydrogen to ensure the absence of flammable gas mixtures in transuranic (TRU) waste payloads as described in Chapter 5.0 of CHTRAMPAC, Rev. 4. For payloads of content code LA 154 and SQ 154, the absence of flammable gas mixtures is ensured as described in Appendix 6.12 of the CH-TRU Payload Appendices, Rev. 3. For payload configurations with unvented heat-sealed bag layers, the absence of flammable gas mixtures is ensured as described in Appendix 6.13 of the CH-TRU Payload Appendices, Rev. 3. For Analytical Category payload containers containing puck drums, the absence of flammable gas mixtures is ensured as described in Appendix 6.14 of the CH-TRU Payload Appendices, Rev. 3.

Certificate Number	Revision No.	Package Identification No.	Page No.	Total No. Pages
9218	0	USA/9218/B(U)F-96 (DOE)	3	5

(2) Maximum quantity of material per package:

Contents not to exceed 7,265 pounds including shoring and secondary containers. The maximum gross weight for a payload container not to exceed the following:

- (i) 1,000 pounds per 55-gallon drum,
- (ii) 328 pounds per 6-inch standard pipe overpack,
- (iii) 547 pounds per 12-inch standard pipe overpack,
- (iv) 550 pounds per S100 pipe overpack,
- (v) 547 pounds per S200 pipe overpack,
- (vi) 547 pounds per S300 pipe overpack,
- (vii) 1,000 pounds per 85-gallon drum,
- (viii) 1,000 pounds per 100-gallon drum,
- (ix) 4,000 pounds per SWB,
- (x) 6,700 pounds per TDOP, or
- (xi) 350 pounds per CCO.

Maximum number of payload containers per package and authorized packaging configurations are as follows:

- (i) 14 55-gallon drums,
- (ii) 14 standard pipe overpacks,
- (iii) 14 S100 pipe overpacks,
- (iv) 14 S200 pipe overpacks,
- (v) 14 S300 pipe overpacks,
- (vi) 8 85-gallon drums,
- (vii) 6 100-gallon drums,
- (viii) 2 SWBs,
- (ix) 1 TDOP, or
- (x) 14 CCOs

Fissile material not to exceed the limits specified in CH-TRAMPAC, Rev. 4, Section 3.1, *Nuclear Criticality*. Fissile material in the CCCs shall not be machine compacted and shall not exceed 380 fissile gram equivalent of Pu-239 containing less than or equal to 1 percent by weight Be/BeO.

All payloads shall meet the activity limits specified in CH-TRAMPAC, Rev. 4, Section 3.3, *Activity Limits*. The payload is limited to 10^5 A₂ quantities.

Maximum decay heat per package not to exceed 40 watts. Decay heat per payload container not to exceed the values given in CH-TRAMPAC, Rev. 4, Table 5.2-1, *List of Approved Alpha-numeric Shipping Categories, Maximum Allowable Hydrogen Gas Generation Rates, and Maximum Allowable Wattages*, or calculated for approved shipping categories in accordance with

Certificate Number	Revision No.	Package Identification No.	Page No.	Total No. Pages
9218	0	USA/9218/B(U)F-96 (DOE)	4	5

the methodology specified in Section 5.2.3 of CH-TRAMPAC, Rev. 4. For content code LA 154 and SQ 154 payloads, decay heat per payload container not to exceed the values determined as specified in Appendix 6.12 of CH-TRU Payload Appendices, Rev. 3.

(c) Criticality Safety Index

The Criticality Safety Index is = 0.0

(d) Conditions

- (1) Physical form, chemical properties, chemical compatibility, configuration of waste containers and contents, isotopic inventory, fissile content, decay heat, weight, center of gravity, and radiation dose rate must be determined and limited in accordance with CH-TRAMPAC, Rev. 4.
- (2) Each payload container must be assigned to a shipping category in accordance with CH-TRAMPAC, Rev. 4, Section 5.1, *Payload Shipping Category*. For a payload assembly made up of payload containers with the same shipping categories, each payload container and payload assembly must not exceed the allowable wattage in accordance with CH-TRAMPAC, Rev. 4, Section 5.2.3, *Hydrogen Gas Generation Rate and Decay Heat Limits for Analytical Category*, or must be tested for gas generation in accordance with CH-TRAMPAC, Rev. 4, Section 5.2.5, *Unified Flammable Gas Test Procedure*. For a payload made up of payload containers with different (nonequivalent) shipping categories, the flammability index of each payload container must not exceed 50,000 in accordance with CH-TRAMPAC, Rev. 4, Section 6.2.4, *Mixing of Shipping Categories*, and Appendix 2.4 of the CH-TRU Payload Appendices, *Mixing of Shipping Categories and Determination of the Flammability Index*. For Analytical Category payload containers containing puck drums, the absence of flammable gas mixtures is ensured as described in Appendix 6.14 of the CH-TRU Payload Appendices, Rev. 3. Each content code LA 154 and SQ 154 payload container must be assigned to a shipping category in accordance with Appendix 6.12 of CH-TRU Payload Appendices. Content code LA 154 and SQ 154 payload containers may only be assembled with other payload containers belonging to content code LA 154 and SQ 154, respectively, or dunnage in accordance with Appendix 6.12 of CH-TRU Payload Appendices. For a payload of content code LA 154 or SQ 154 containers with different shipping categories, the flammability index of each payload container must not exceed 50,000 in accordance with Appendix 6.12 of CH-TRU Payload Appendices.
- (3) Payload containers within a package shall be selected in accordance with CH-TRAMPAC, Rev. 4, Section 6.0, *Payload Assembly Requirements*. Payload containers of content code LA 154 and SQ 154 shall be assembled in accordance with Appendix 6.12 of CH-TRU Payload Appendices, Rev. 3.
- (4) Each payload container must be vented in accordance with Section 2.5, *Filter Vents*, of the CHTRAMPAC, Rev. 4. Payload containers that were not equipped with filtered vents during storage must be aspirated in accordance with CH-TRAMPAC, Rev. 4, Section 5.3, *Venting and Aspiration*.
- (5) For close-proximity and controlled shipments meeting the conditions specified in Appendices 3.5 and 3.6, respectively, of CH-TRU Payload Appendices, shipping periods of 20 days and 10 days may be applicable. The shipping period for any mode of transport is not to exceed 60 days. For content code LA 154 and SQ 154 shipments, the shipping period as defined in Appendix 6.12 of the CH-TRU Payload Appendices is not to exceed 5 and 10 days, respectively.

Certificate Number	Revision No.	Package Identification No.	Page No.	Total No. Pages
9218	0	USA/9218/B(U)F-96 (DOE)	5	5

- (6) In addition to the requirements of Subpart G of 10 CFR Part 71:
- (i) Each package must be prepared for shipment and operated in accordance with the procedures described in Chapter 7.0, *Operating Procedures*, of the application, as supplemented. For content code LA 154 and SQ 154 payloads, each package must be prepared for shipment and operated in accordance with the procedures described in Chapter 7.0 of the application, as modified by Appendix 6.12 of CH-TRU Payload Appendices.
 - (ii) Each package must be tested and maintained in accordance with the procedures described in Chapter 8.0, *Acceptance Tests and Maintenance Program*, of the application, as supplemented.
 - (iii) All freestanding water must be removed from the inner containment vessel cavity and the outer confinement vessel cavity before shipment.
- (7) The package authorized by this certificate is hereby approved for use under the provisions of 49 CFR 173.7(d).
- (8) Only the Department of Energy (DOE) or persons working under contract to DOE shall consign the package for shipment.
- (9) Nuclear Regulatory Commission (NRC) or Agreement State licensees shall not consign a DOE certified package for shipment, but can transfer the material on-site to DOE or persons working under contract to DOE, for consignment of the package.
- (10) This certificate does not authorize consignment of the package for shipments to the Waste Isolation Pilot Plant (WIPP): only package certificates issued by the NRC authorize consignments of the package to WIPP.

(e) Supplements

None



EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

DOE Packaging Certification Program

PACKAGE CERTIFICATION APPROVAL RECORD

Certificate of Compliance Number 9218

Package Identification No. USA/9218/B(U)F-96 (DOE)

Model No. TRUPACT-II

Docket 16-34-9218

Department of Energy (DOE) Certificate of Compliance (CoC), Certificate Number 9218, Revision 0 (initial issue), Package Identification No. USA/9218/B(U)F-96 (DOE), for Model TRUPACT-II was issued to authorize use of the package for site-to-site shipments of DOE materials (e.g., DOE shipments to the Advanced Mixed Waste Treatment Project to process contact-handled transuranic waste.)

Revision 0 of DOE CoC 9218 is based on the DOE Packaging Certification Program's endorsement of the Nuclear Regulatory Commission (NRC) CoC 9218, Revision 22 and TRUPACT-II Safety Analysis, Revision 23, dated March 2013.

The expiration date for DOE Certificate Number 9218, Revision 0, is August 31, 2019, and coincides with the expiration of the NRC CoC.

This certificate constitutes authority for DOE to use the Model TRUPACT-II package for shipment of the authorized contents under 49 CFR 173.7(d); however, this certificate does not authorize use of the TRUPACT-II for DOE shipments to the Waste Isolation Pilot Plant (WIPP). Only the NRC CoC authorizes use of the TRUPACT-II for WIPP shipments.

Only DOE or persons working under contract to DOE shall consign the package for shipment. NRC or Agreement State licensees shall not consign a DOE certified package for shipment, but can transfer the material on-site to DOE or persons working under contract to DOE for consignment of the package.

Joanne Lorence
Headquarters Certifying Official
Director
Office of Packaging and Transportation

Date: 09/13/2016