
**Oak Ridge National Laboratory
Transportation and Packaging Management
Procedure**

**Radioactive Materials, Radioactive Waste, and Mixed Waste Shipments
TPM-R-1, Revision 4**

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August 30, 2005**

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Date Printed:

Verifier:

I. PURPOSE

To provide general instructions for the packaging and shipment of radioactive materials, radioactive waste, and mixed wastes to off-site locations. **R(4)**

II. APPLIES TO

This procedure applies to personnel in Transportation and Packaging Management (TPM) who ship radioactive materials, radioactive waste, and mixed wastes to off-site locations. **R(4)**

III. OTHER DOCUMENTS NEEDED

-) Air Waybill
-) Bill of Lading
-) Canada Customs Invoice for Shipments to Canada
-) Defense Program Packing List
-) Exclusive Use Instructions
-) Facsimile Invoice
-) Form 741, Department of Energy (DOE)/Nuclear Regulatory Commission (NRC)
-) Uniform Hazardous Waste Manifest
-) ORNL-28, Request for Shipment of Radioactive Materials (See Exhibit A) **R(4)**
-) Shipper's Declaration of Dangerous Goods
-) Shipper's Export Declaration
-) State Notification of Transportation of Radioactive Material
-) TPM-R-001, Radioactive Materials Shipper Order
-) TPM-R-002, Radioactive Shipments Radiation Protection Inspection
-) TPM-R-003, Radioactive Materials Packaging Certification
-) TPM-R-004, Transport Vehicle and Cask HP Monitoring Checklist
-) TPM-S-001, Shipping Paper/Transportation Checklist
-) ORNL-28-IBO, Request for Shipment of Radioactive Material **R(4)**

For Isotope Business Office (IBO) shipments, ORNL-28-IBO may be used instead of ORNL-28. **R(4)**

Unless otherwise indicated, the current revisions to the above forms and documents can be obtained from TPM.

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IV. RESPONSIBILITIES

A. Packaging Radioactive Materials, Radioactive Waste, and Mixed Waste Shipment R(4)

1. Packaging Operations

- a. Receives ORNL-28, `Request for Shipment of Radioactive Materials, and other applicable documents (i.e., Material Safety Data Sheet, UCN-2109) from shipment or campaign originator. R(4)

- b. **For ORNL shipments only**, forwards copy of ORNL-28, Request for Shipment of Radioactive Materials, to Isotopes Business Office (IBO) for license verification of the receiving facility. (IBO performs this verification for IBO shipments before sending ORNL-28-IBO to TPM Packaging Operations). R(4)

- c. Obtains the following information for each shipment as applicable:
 - (1) analytical data,
 - (2) Certificate of Competent Authority (CoCA),
 - (3) Certificate of Compliance (CoC),
 - (4) customer requested information (e.g., assay information, special handling instructions, etc.),
 - (5) data on non-rad constituents,
 - (6) Form 741 DOE/NRC for Nuclear Materials,
 - (7) packaging procedure or checklist,
 - (8) packaging schematic,
 - (9) Safety Analysis Report for Packaging (SARP),
 - (10) Special Form documentation,
 - (11) Type A test documentation,
 - (12) Lab Wastes Services (LWS) documentation for waste shipments. R(4)

- d. Determines if material is DOT radioactive. If not, forwards copy of ORNL-28 and calculation sheet to Transportation Operations and either sends package from RAMSPAC with non-DOT Rad "Insert" (See Exhibit B & C) placed inside or instructs requestor to transfer material to 7001. R(3)

Note: Calculation sheet to Transportation Operations is not required if total activity per consignment is <27 nCi or activity concentration is <2.7 pCi/gram. R(4)

- e. Classifies material for shipment and determines proper shipping name, labels, and required markings. R(4)

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Note: For mixed waste shipments, LWS will forward the ORNL-28 and the Hazardous Waste Manifest to TPM for verification of initial LWS classification. **R(4)**

- f. Verifies that **IBO** has completed license verification and relevant information has been added to ORNL-28-IBO by IBO.
- g. Selects appropriate packagings and loading instructions for material, or approves customer-selected packaging and loading instructions for materials.
- h. Ensures DOE approved shipments comply with documented approval letters. **R(4)**
- i. Completes TPM-R-001, Radioactive Materials Shipping Order, and TPM-R-003, Radioactive Materials Packaging Certification.
- j. **If** material is spent nuclear fuel (SNF) or other shipments defined by scope of DOE action items, **then** issues Tennessee Oversight Agreement (TOA) notification at least ten (10) working days prior to shipment or as soon as possible. **R(4)**

Note: Blanket notices are used for some shipments. **R(4)**

- k. **For ORNL shipments only, if** Form 741, DOE/NRC for nuclear materials is required, **then** contacts ORNL Nuclear Material Control & Accountability (NMC&A) for completion of Form 741, and ensures that a copy of Form 741 is forwarded with the package. **R(4)**
- l. Arranges Health Physics (HP) contamination survey of package, and obtains copy of TPM-R-002, Radioactive Shipments Health Physics Inspection or TPM-R-004, Transport Vehicle and Cask HP Monitoring Checklist and/or other site-specific HP forms, as applicable.
- m. Retains file copy of the document package for minimum of three (3) years.
- n. Coordinates delivery of packages to Building 7001, notifies Transportation Operations that package(s) is ready for shipment, and provides paperwork documentation to Transportation Operations.

B. Shipping Radioactive Materials, Radioactive Waste, and Mixed Waste **R(4)**

1. Transportation Operations

- a. Receives shipping documentation from Packaging Operations or LWS.

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- b. For SNF shipments, issues state notification letters-at least seven (7) calendar days prior to shipment. **R(4)**
 - c. Selects carrier through ATMS for all LTL shipments and selects truckload and dedicated shipments through carrier negotiations.
 - d. Prepares or obtains the following shipping forms as applicable:
 - (1) Air Waybill
 - (2) Bill of Lading
 - (3) Canada Customs Invoice for Shipments to Canada
 - (4) Exclusive Use Instructions
 - (5) Facsimile Invoice
 - (6) Hazardous Waste Manifest (prepared by LWS) **R(4)**
 - (7) Shipper's Declaration of Dangerous Goods
 - (8) Shipper's Export Declaration
 - (9) Any other appropriate forms required **R(4)**
 - e. Completes TPM-S-001, Shipping Paper/Transportation Checklist and, if applicable, the "Dangerous Goods Checklist for a Radioactive Shipment." **R(4)**
 - f. Obtains peer review of shipping papers and package.
 - g. Forwards copy of shipping papers, other than those materials listed on the Routine List, to the designated Compliance Reviewer. **R(4)**
- 2. Designated Compliance Reviewer**
- a. Performs regulatory compliance reviews, resolves discrepancies, stamps and/or signs shipping documents indicating approval, and notifies Transportation Specialist of approval.
- 3. Transportation Operations**
- a. Inspects shipment for DOT/RCRA/TSCA markings, labeling, and placarding requirements.
 - b. Ensures that inspections required for truckload carrier and Highway Route Control Quantity (HRCQ) shipments are performed.
 - c. Ensures Federal Motor Carrier Safety Regulations are met by carrier prior to departure.
 - d. Verifies shipping papers have been signed with designated technical contact noted and ensures that carrier is informed of security responsibilities and consigns shipment to carrier.

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- e. Faxes Emergency Response Guide (ERG) information with copy of shipping papers to the Laboratory Shift Superintendent (LSS) Office. **R(4)**

Note: LWS faxes copies of Hazardous Waste Manifest to LSS. **R(4)**
- f. For fissile, Type B, and HRCQ shipments, notifies consignee via fax notification of dates of shipment and expected arrival per 173.22(c) and requests confirmation. **R(3, 4)**
- g. Sends a copy of Bill of Lading or Air Waybill, Shipper's Declaration of Dangerous Goods, and Health Physics Survey Sheet to IBO. **R(4)**
- h. Notifies NMC&A via phone when nuclear material which requires a Form 741 is shipped. **R(4)**
- i. Sends copy of Hazardous Waste Manifest to Duratek Federal Services, 345 Hills Street, Richland, Washington 99354, Attn: ATMS Coordinator. **R(4)**
- j. Enters hazardous materials information other than Hazardous Waste Manifest information into ATMS.
- k. Retains copy of shipping papers/documentation for file.

V. RECORDS

Records are generated and maintained in accordance with established company records management practices and approved records inventory and disposition schedules.

Packaging Operations retains file copy of the document package for minimum of three (3) years.

Transportation Operations retains radioactive shipping paper documentation indefinitely. **R(4)**

VI. REFERENCES

1. Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Materials"
2. Title 40, Code of Federal Regulations, Parts 260-268, 302, "Protection of Environment"
3. Title 49, Code of Federal Regulations, Parts 106 – 180, "Hazardous Materials"
4. Dangerous Goods Regulations International Air Transportation Association

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**Exhibit A (Revision 4)
UCN-28 - Request for Shipment of Radioactive Material**

REQUEST FOR SHIPMENT OF RADIOACTIVE MATERIAL					
REQUESTER'S NAME		PHONE	BLDG./MAILSTOP	DIVISION	
SHIP TO		REQUESTED SHIPPING DATE	CHARGE NUMBER		
		SHIP BY <input type="checkbox"/> MOTOR <input type="checkbox"/> FASTEST WAY <input type="checkbox"/> NO PREFERENCE			
		<input type="checkbox"/> AIR <input type="checkbox"/> OTHER _____			
		PREFERRED CARRIER _____			
ATTENTION		SHIPPING CHARGES <input type="checkbox"/> PREPAID <input type="checkbox"/> COLLECT			
PHONE	FAX	GROSS WEIGHT OF PACKAGE(S), PER PACKAGE			
LIST EACH ISOTOPE WITH ACTIVITY AND/OR GRAMS. (LIST PER PACKAGE, ATTACH ADDITIONAL SHEETS, AS NEEDED).					
ISOTOPE	ACTIVITY	ISOTOPE WEIGHT (g)	ISOTOPE	ACTIVITY	ISOTOPE WEIGHT (g)
AUTHORITY (EXPORT LICENSE DESIGNATION IS MANDATORY FOR ALL INTERNATIONAL SHIPMENTS).			VALUE FOR CUSTOMS PURPOSES ONLY:		
PHYSICAL FORM <input type="checkbox"/> SOLID <input type="checkbox"/> LIQUID <input type="checkbox"/> GAS	CHEMICAL FORM	MATERIAL WEIGHT OR VOLUME	TOTAL NO. OF PACKAGES		
ASSAY DATE	HEAT LOAD (WATTS)	PURPOSE OF SHIPMENT	TEMPERATURE CONTROL REQUIRED? (IF YES, WHAT TEMP?) <input type="checkbox"/> YES _____ °C <input type="checkbox"/> NO		
ARE THE RADIOACTIVE MATERIAL(S) INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, OR MEDICAL DIAGNOSIS, OR TREATMENT?			<input type="checkbox"/> YES <input type="checkbox"/> NO		
EXTERNAL RAD READING(S) OF INTERNAL CONTAINER(S) (mR/hr)		HP TAG APPLIED (OR, FOR EMPTY PKGS., INTERNAL & EXTERNAL SURVEY COMPLETE)? <input type="checkbox"/> YES <input type="checkbox"/> NO			
URANIUM ENRICHMENT (%U235) IF APPLICABLE		AT WHICH SITE & BLDG. IS THE MATERIAL LOCATED?			
IS NRC 49 CFR 171 DOCUMENTATION REQUIRED FOR THIS SHIPMENT? (REQUESTER MUST CONTACT NRC TO GENERATE DOE/NRC FORM 741 OR TO CONCUR THAT NONE IS NEEDED.) <input type="checkbox"/> YES <input type="checkbox"/> NO					
LIST ANY ADDITIONAL HAZARDS (FLAMMABLES, CORROSIVES, EXPLOSIVES, OXIDIZERS, POISONS, COMBUSTIBLES, PEROXIDES, NITRATES, ACIDS USED AS PRESERVATIVE, OILS, PCRA WASTE CODES, ASBESTOS, PCBs, ETC.), STATE QUANTITIES, CONCENTRATION, pH, FLASH POINT, TEST RESULTS, ETC.					
DESCRIBE THE PACKAGING, INCLUDE ALL LEVELS OF CONTAINMENT AND RECORD SERIAL NUMBERS, TORQUE VALUES, BOTTLE SIZES, CONTAINER CERTIFICATION, SPECIAL FORM CERTIFICATION, CONTAINER WEIGHT, ETC., AS APPROPRIATE (OR ATTACH LOADING CHECK SHEET).					
ADDITIONAL INFORMATION					
REQUESTER SIGNATURE				DATE	
NAME (PRINTED)			BADGE	DIVISION	
*** ORNL Requesters - Submit license with this form, but do not write below. Non-ORNL Requesters - Complete below.***					
NRC LICENSE NUMBER OF CONSIGNEE		LICENSE VERIFIED BY		DATE	
ORNL-28 (7-2005)		<div style="display: inline-block; border: 1px solid black; padding: 2px 10px; background-color: #f0f0f0;">PRINT</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 10px; background-color: #f0f0f0; margin-left: 20px;">SAVE</div>		PAGE OF	

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Exhibit B

CAUTION

RADIOACTIVE MATERIAL

The contents in this package do not meet the U.S. Department of Transportation's definition for ***radioactive material*** for the purpose of shipping; however, the contents do meet the U. S. Department of Energy's definition for ***radioactive material***.

All handlers of this package should be aware that the inner contents are radioactive, and appropriate precautions should be taken prior to opening this package.

CAUTION

RADIOACTIVE MATERIAL

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Exhibit C

CAUTION

SUSPECT RADIOACTIVE MATERIAL

The contents in this package do not meet the U.S. Department of Transportation's definition for *radioactive material* for the purpose of shipping; however, the contents may meet the U.S. Department of Energy's definition for *radioactive material*.

All handlers of this package should be aware that the inner contents may be radioactive, and appropriate precautions should be taken prior to opening this package.

CAUTION

SUSPECT RADIOACTIVE MATERIAL

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