UNIT 8
OTHER REQUIREMENTS

U.S. Nuclear Regulatory Commission and Agreement States

"Transportation of Radioactive Materials"
NRC Course H-308

OBJECTIVES

- Identify the requirements prior to shipment.
- Identify security requirements for the transport of material.
- Identify the circumstances for required notifications.
- Identify the special shipment requirements for HRCQ.

SHIPPING PAPERS

- Required Items:
  - Description of hazardous material [(172.200(a)]
  - No code or abbreviation [172.201(a)(3)]
  - Additional information consistent with the required description. [172.201(a)(4)]
  - Emergency response number [172.201(d)]
    - Does not apply to LQ [172.604(c)]
- Retention [172.201(e) and 177.817(f)]
  - Hazardous waste – 3 yrs
  - All other hazardous materials -2 yrs

TRANSPORT DOCUMENTS

(SHIPPING PAPERS)

- Describes particulars of the consignment
- Consignor is responsible
- Requires specific information in a specified order format
- Concludes with the consignor's Declaration
- May require specific form be used

SHIPPER'S CERTIFICATION FOR RADIOACTIVE MATERIALS
Two completed and signed copies of this certification shall be handed to the carrier.
(Use block letters)

WARNING: Failure to comply in all respects with the applicable regulations of the Department of Transportation, 49-CFR, CAB 82 and, for international shipments, the IATA Restricted Articles Regulations may be a breach of the applicable law, subject to legal penalties. This certification shall in no circumstances be signed by an IATA Cargo Agent or a consolidator for international shipments.

This shipment is within the limitations prescribed for (mark one)
X passanger aircraft cargo-only aircraft

NATURE AND QUANTITY OF CONTENT					PACKAGE			
PROPER SHIPPING NAME	RADIONUCLIDE	GROUP	FORM	ACTIVITY		CATEGORY	TRANSPORT INDEX	TYPE
FOR US SHIPMENTS SEE SECTION 2 CAB 82 TABLE 6-0	NAME OR SYMBOL OF PRINCIPAL RADIOACTIVE CONTENT	GROUP NUMBER OF GROUPS I TO VII	CHEMICAL FORM AND PHYSICAL STATE: GAS, LIQUID, SOLID or SPECIAL FORM or SPECIAL ENCAPSULATION	NUMBER OF CURIES OR MILLICURIES	NUMBER OF PACKAGES	I-WHITE OR II-YELLOW OR III-YELLOW LABEL	FOR YELOW LABEL CATEGORIES ONLY	INDUSTRIAL OR TYPE A OR TYPE B

ADDITIONAL INFORMATION REQUIRED FOR FISSILE MATERIALS ONLY

EXEMPTED FROM THE ADDITIONAL REQUIREMENTS FOR FISSILE MATERIALS SPECIFIED IN / 1 OF PART 2 OF THE IATA RESTRICTED ARTICLES REGULATIONS NAMES PLUS QUANTITY IN GRAMS OR CONCENTRATION OR ENRICHMENT IN U235

NOT EXEMPTED FISSILE CLASS I FISSILE CLASS II FISSILE CLASS III

Additional certificates obtained by the Shipper when necessary N/A
Special Form Encapsulation Certificate(s)
Type B Packaging Certificate(s)
Certificates for Fissile Material
Certificate(s) for Large Radioactive Source
Government Approvals / Permits

Special Handling Information
NONE

I hereby certify that the contents of this consignment are fully and accurately described above by Proper Shipping Name and are classified, packed, marked, labeled and in proper condition for carriage by air according to applicable national governmental regulations, and for international shipments, the current IATA Restricted Articles Regulations.

Name and full address of Shipper	Name and title of person signing Certification
Date:	Signature of the Shipper (see WARNING above)

Air Waybill No:	Airport of Departure:	Airport of Destination

NRC Form 540 -"Low level Waste Manifest"
NRC Form 541 – "Low Level Waste Manifest Container and Waste Description "

DESCRIPTION OF RADIOACTIVE MATERIALS

- Required Information
  - Package type and count
  - Basic description
  - Quantity
  - Radionuclide(s)
  - Physical form (except A_1)
  - Chemical form (except A_1)
  - Activity per package
  - Label applied
  - Transport Index (Y-II & Y-III)
  - Emergency contact number
  - Certification Statement
  - Signature

- Case-by-Case Info
  - Fissile excepted
  - Criticality Safe Index
  - Exclusive use
  - Indication
  - Highway Route Controlled Quantity or "HRCQ"
  - Reportable Quantity
  - DOT Number
  - CoC Number

BASIC DESCRIPTION FOR CLASS 7 MATERIALS

- Mandatory for shipping paper description
- Two displays permitted domestically until 01 Jan 2013
  - Either…

UN Identification Number	Col 4, §172.101
Proper Shipping Name	Col 2, §172.101
Hazard Class/Division (Subsidiary Hazard)	Col 3, §172.101
-or –	
Proper Shipping Name	
Hazard Class/Division (Subsidiary Hazard)	
UN Identification Number	

Effective till January 1, 2013
§171.14(e)

49 CFR 172.202(a); 171.14(e)

RADIOACTIVE MATERIAL SHIPPING DESCRIPTIONS

Emergency Contact: 509-628-1020

1 box (DOT 7A) 65 lbs net

Radioactive material, Type A package,

Special Form; 7; UN3332; Am-241; 0.7 MBq; Radioactive White-I

Emergency Contact: 509-628-1020

1 metal cask 10,665 lbs gross

RQ UN 3328 Radioactive material, Type B(U) package, fissile; 7; Pu-239, Pu-241,; Am-241; solid, oxide; 6.3 TBq; Radioactive Yellow III; TI = 0.1; CSI = 25; USA/9353/B(U)F-85; Exclusive use shipment Radioactive Yellow III; HRCQ

EMERGENCY RESPONSE INFORMATION

MUST BE INCLUDED

- Telephone number (> LQ: 24 hr operation)
  - Immediate access
  - Information to mitigate accident situation
  - Available while in transport
  - Includes all access codes
  - Service organization authorized
- Information
  - Applicable for each hazmat
  - Cross referenced to hazmat
  - ERG helpful
  - Encompasses transport facilities also

49 CFR 172.201(d); 172 Subpart G

SHIPPING PAPER MAINTENANCE

IN THE CAB OF THE VEHICLE

- The shipping paper must be: [49 CFR 177.817(e)]
  - Within arms reach of the driver at all times while restrained in the lap belt
  - Visible and clearly distinguished
- The hazardous materials descriptions must be either:
  - On the top of the shipping documents
  - Clearly recognized by some means (e.g. tabs)
  - Separated from all other non-hazmat documents and clearly identified

TRANSPORT DOCUMENT

OTHER REQUIRED INFORMATION

- Statement regarding actions, if any, required to be taken by the carrier:
  - Supplementary requirements for loading, stowage, carriage, handling, and unloading
  - Special stowage provisions for the safe dissipation of heat or statement that no such requirements apply
  - Restriction on the mode of transport
  - Necessary routing instructions (HRCQ)
  - Emergency arrangements

HAZCOM REQUIREMENT EXCEPTIONS

EXCEPTED PACKAGE

- A shipping paper is required if excepted package materials meets the definition of a:
  - Hazardous substance
  - Hazardous waste
- HOWEVER…
  - Full Class 7 shipping description required except for limited quantities
  - Identity of hazardous substance may now be required

49 CFR 173.421 – 173.426; 173.428; 173.203

NRC REQUIRED NOTIFICATION

- Notify appropriate NRC Regional Office and carrier of delivery when:
  - Contamination exceeds transport limits
  - Radiation levels exceed transport limits
- Report to the appropriate NRC office within 60 days:
  - Any significant reduction in the effectiveness of any NRC approved package during its use
  - Details after the packagings first use:
    - Of any defects of safety significance to the packaging
    - Means to repair defects
    - Means to prevent recurrence
  - Instances in which the CoC was not observed

10 CFR 20.1906(d); 10 CFR 71.95

SPECIAL SHIPMENT REQUIREMENTS

HRCQ

- Transport on "preferred route" only
  - Interstate without State designated alternate route, or
  - State-designated route selected by State routing agency
  - Shortest route
  - Beltways used unless otherwise designated
  - Deviation authorized for:
    - Pick-up and delivery of material
    - Rest, fuel or emergency situation
  - Written route plan required
- Additional carrier requirements
  - Supplemental training (every 2 years)
  - Proof of supplemental training in immediate possession at all times
  - Route plan in immediate possession at all times

49 CFR 397.101; 397.103

SHIPMENT REQUIRING NOTIFICATION

IRRADIATED NUCLEAR FUEL & HRCQ

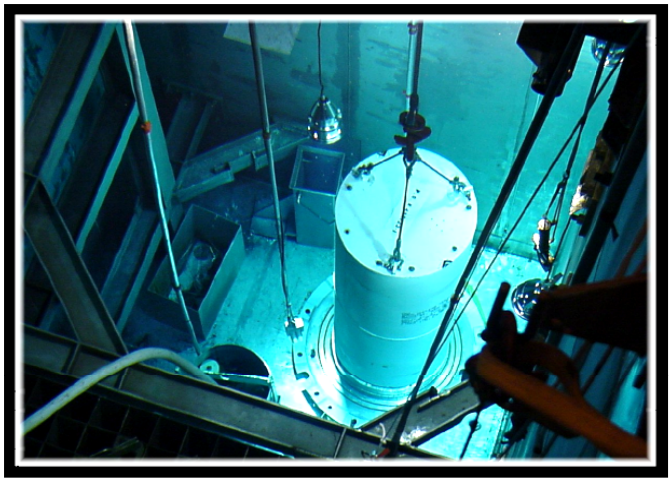
- Notification to states if:
  - In Type B package
  - Transported to or across State boundary
  - Destined to a disposal facility
- Notification
  - Sent to governor or designee
  - In writing
  - 3 year record retention
  - Within required timeline

Notification per 10 CFR 71.97 is required for shipments of irradiated reactor fuel subject To 10 CFR 73.37(f).

10 CFR 71.97

SPECIAL SHIPMENT REQUIREMENTS

IRRADIATED REACTOR FUEL



- Subject to 10 CFR 73.37 if:
  - NRC Licensee, and
  - > 100 grams of irradiated fuel, and
  - > 100 Rem/hr @ 1 meter from unshielded material
- If shipment not subject
  - Carrier report filed ≤ 90 days with FMCSA if shipment NOT subject to 10 CFR 73
- Advanced notification to NRC and States
- Safeguard and Security requirements must be met

10 CFR 397.101; 10 CFR 71.97; 10 CFR 73

SAFEGUARDS and SECURITY

DOT REQUIREMENTS

- Purpose
  - To enhance security of hazardous materials transported in commerce
- Major Aspects
  - Security plans
  - Training

49 CFR 172 Subpart I

DOT SECURITY PLAN

- Subpart I in Part 172
- Required for:
  - Persons subject to Subpart I of Part 172 (§172.800)
  - DOT registration
    - HRCQ radioactive materials
    - > 25 kg of 1.1, 1.2, or 1.3 material
    - > 1 L of PIH, Zone A material
    - Bulk packaging > 3,500 gallons or 468 ft^3
    - > 2,268 kg of one Class/Division requiring placards
    - Select agent/toxic regulated by CDC under 42 CFR 73
    - Shipments that require placards
- Required in place 9/25/03

ELEMENTS OF THE WRITTEN SECURITY PLAN

- Transportation Security Risk Assessment
  - Identify possible transportation security risks
  - Identify measures to reduce or eliminate risks
  - Must be maintained and readily available
  - Data and links available at DOT's website:
    - *http://hazmat.dot.gov/rmsef.htm*
- Personnel Security
  - Verify job application data
- Unauthorized Access
  - Process to ensure unauthorized personnel do not have access to hazardous materials or transport conveyances being prepared for transport.

49 CFR 172.802 Subpart I

ELEMENTS OF THE WRITTEN SECURITY PLAN (cont'd)

- En route security
  - Assessment of mode(s) of transportation to verify selection is most appropriate method for efficient and secure movement
  - System to verify carriers selected have an on-going transportation security program
  - System to verify the identity of the carrier and driver prior to release of hazardous materials for highway transport

ELEMENTS OF THE WRITTEN SECURITY PLAN (cont'd)

- En-route security (cont'd)
  - Identification of preferred and alternative routing including acceptable deviations
    - Minimize populated areas
    - Avoid tunnels and bridges
    - Transport without unnecessary delays or layovers
  - System for communicating with the vehicle or its operator
  - System for a customer to alert the shipper if receipt is delayed

HAZMAT SECURITY TRAINING REQUIREMENTS

- General Security Awareness
  - All hazmat employees affected
  - Trained at initial AND renewal date
- Security Plan Specific
  - Trained to specifics of the plan
  - Must include how to recognize a security threat
  - Must include how to respond to a security threat
  - Training must be completed within 90 days of plan completion
  - Other security training can count toward this requirement.

49 CFR 172 Subpart I

SAFEGUARDS and SECURITY
- SNM -

- Pu, U-233, U enriched and material artificially enriched
- Any other material the NRC determines
- Spent nuclear fuel and irradiated reactor fuel

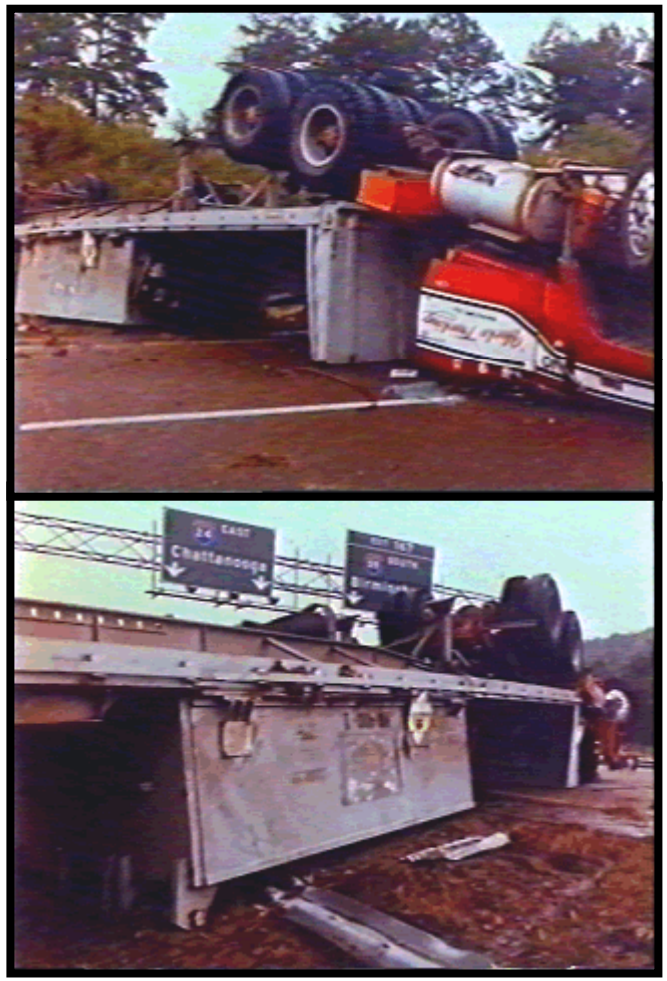
10 CFR 70; 10 CFR 73; 10 CFR 74

MORE SAFEGUARDS and SECURITY

- Security Measures
  - Federal and State notifications
    - NRC (and others)
      - Governor or designee
      - All states in path
  - Employee screening
  - Routing
  - Dedicated, special vehicles
  - Escort support (varied)
  - Threat assessment
  - Response plans
  - Constant communication
  - Chain of custody

10 CFR 70; 10 CFR 71.97; 10 CFR 73; 10 CFR 74

SOME SITUATIONS REQUIRE NOTIFICATION TO DOT



- ASAP, but always ≤ 12 hours
- As a direct result of the hazmat
  - Death
  - Hospitalization
  - General public evacuation ≥ 1hour
  - Facility or traffic artery closed for ≥ 1hour
  - Operational flight pattern of an aircraft is altered
- Class 7 incident
- Division 6.2 incident
- Bulk release of marine pollutant
- Other imminent situation

49 CFR 171.15

WRITTEN REPORTS OF INCIDENTS MUST BE FILED WITH DOT

- Applies to person in "physical possession in-transportation"
- Required when:
  - 171.15 (immediate) notification occurs
  - Unintentional release of hazmat or hazwaste
  - > 1,000 gal DOT spec cargo tank containing hazmat and suffers damage to containment requiring repair (even without a leak occurring)
  - Undeclared hazmat

49 CFR 171.15(b); 49 CFR 171.16

WRITTEN REPORTS OF INCIDENTS MUST BE FILED WITH DOT (cont'd)

- Must use DOT Form F5800.1 (01/2005)
- Submitted within 30 days
- Submitted to:
  - PHMSA
  - FAA Security Field Office nearest location of incident if transported by aircraft
  - Originator's files
- Updating of report within 1 year if:
  - Death from hazmat
  - Hazmat or package info differs
  - Damage, loss or related costs known or changes by ≥ $25,000 or ≥ 10%

U.S. Department of Transportation
Research and Special Programs Administration

Hazardous Materials Incident Report

Form Approval OMB No. 2137-0039

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 2137-0039. The filling out of this information is mandatory and will take 96 minutes to complete.

INSTRUCTIONS: Submit this report to the Information Systems Manager, U.S. Department of Transportation, Research and Special Programs Administration, Office of Hazardous Materials Safety, DHM-63, Washington, D.C. 20590-0001. If space provided for any item is inadequate, use a separate sheet of paper, identifying the entry number being completed. Copies of this form and instructions can be obtained from the Office of Hazardous Materials Website at http://hazmat.dot.gov. If you have any questions, you can contact the Hazardous Materials Information Center at 1-800-HMR-4922 (1-800-467-4922) or online at http://hazmat.dot.gov.

PART I - REPORT TYPE

1. This is to report: ☐ A) A hazardous material incident ☐ B) An undeclared shipment with no release ☐ C) A specification cargo tank 1,000 gallons or greater containing any hazardous materials that (1) received structural damage to the lading retention system or damage that requires repair to a system intended to protect the lading retention system and (2) did not have a release.
2. Indicate whether this is: ☐ An initial report ☐ A supplemental (follow up) report ☐ Additional Pages

PART II - GENERAL INCIDENT INFORMATION

3. Date of Incident: _____ 4. Time of Incident (use 24-hour time): _____
5. Enter National Response Center Report Number (if applicable): _____
6. If you submitted a report to another Federal DOT agency, enter the agency and report number: _____
7. Location of Incident: City: _____ County: _____ State: _____ ZIP Code (if known): _____
Street Address/Mile Marker/Yardname/Airport/Body of Water/River Mile _____
8. Mode of Transportation ☐ Air ☐ Highway ☐ Rail ☐ Water
9. Transportation Phase ☐ In Transit ☐ Loading ☐ Unloading ☐ In Transit Storage
10. Carrier/Reporter Name _____ Street _____ City _____ State _____ ZIP Code _____ Federal DOT ID Number _____ Hazmat Registration Number _____
11. Shipper/Offeror Name _____ Street _____ City _____ State _____ ZIP Code _____ Waybill/Shipping Paper _____ Hazmat Registration Number _____
12. Origin (if different from shipper address) Street _____ City _____ State _____ ZIP Code _____
13. Destination Street _____ City _____ State _____ ZIP Code _____
14. Proper Shipping Name of Hazardous Material: _____
15. Technical/Trade Name: _____
16. Hazardous Class/Division: _____ 17. Identification Number: _____ (E.g. UN2794, NA 2020) 18. Packing Group: _____ (If applicable) 19. Quantity Released: _____ (Include Measurement Units)
20. Was the material shipped as a hazardous waste? ☐ Yes ☐ No If yes, provide the EPA Manifest Number: _____
21. Is this a Toxic by Inhalation (TIH) material? ☐ Yes ☐ No If yes, provide the Hazard Zone: _____
22. Was the material shipped under an Exemption, Approval, or Competent Authority Certificate? ☐ Yes ☐ No
If yes, provide the Exemption, Approval, or CA number: _____
23. Was this an undeclared hazardous materials shipment? ☐ Yes ☐ No
At this point, the answer to Part I, Question 1 above determines which Part to complete next:
If you checked 1A or 1C, go to Part IV. If you checked 1B, and the mode of transportation is Air, go to Part V. If you checked 1B, and the mode of transportation is not Air, go to Part III.

Form DOT F 5800.1 (01-2004) Page 1 Reproduction of this form is permitted

Page 1 of 4

49 CFR 171.16

NRC REQUIRED NOTIFICATION

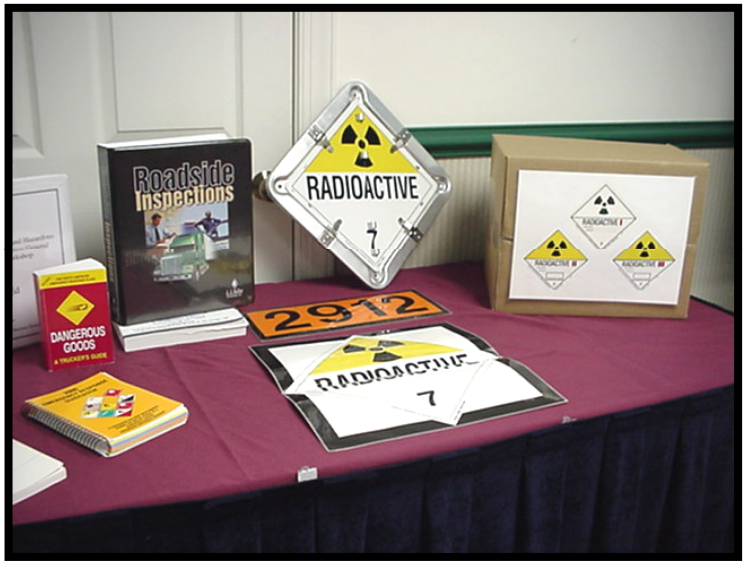
- Notify appropriate NRC Regional Office and carrier of delivery when:
  - Contamination exceeds transport limits
  - Radiation levels exceed transport limits
- Report to the appropriate NRC office within 60 days:
  - Any significant reduction in the effectiveness of any NRC approved package during its use
  - Details after the packagings first use:
    - Of any defects of safety significance to the packaging
    - Means to repair defects
    - Means to prevent recuurence
  - Instances in which the CoC was not observed

10 CFR 20.1906(d); 10 CFR 71.95

TRAINING REQUIREMENTS

- DOT -

- Applicability
  - All hazmat employees
- Scope
  - General awareness
  - Safety
  - Security
  - Function specific (QA too)
  - Driver
- Responsibility
  - Hazmat employer
- Requirements
  - Train & test to job function
  - Complete within 90 days
  - Retrain & retest ≤ 3 years
  - Remain current to changes

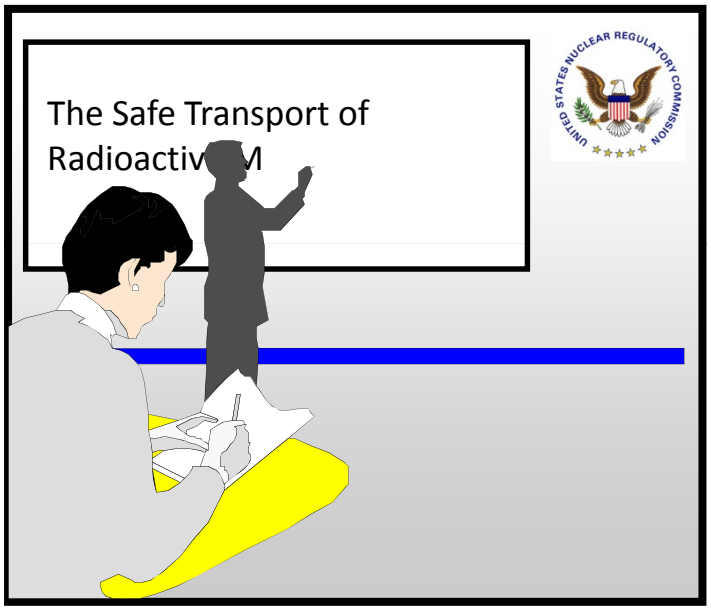


49 CFR 171.8; 172 Subpart H; 49 CFR 397.101

TRAINING REQUIREMENTS

- NRC -

- All licensees
  - Mandatory DOT training and testing
    - 10 CFR 71.5(a)(1)(vi)
  - Carriers of exclusive use conveyances
    - 10 CFR 71.4, *"Exclusive Use"*
  - Quality assurance program
    - 10 CFR 71.105(d)



SAFE TRANSPORT OF RADIOACTIVE MATERIALS

CARRIERS ROLE

- Provide incident free transport
- Required responsibilities
  - NRC license
  - Segregation of radioactive material Emergency Procedures
  - Quality Assurance
- Comply with consignor's instructions
  - Loading, storage, transport, handling, and unloading
  - Segregation from persons or other dangerous goods
  - Maintenance of exclusive use controls or special modal constraints

49 CFR 174-177; 49 CFR 383-399; 10 CFR 71.0; 71.5

PRACTICAL RESPONSIBILITIES

FOR CARRIERS OF RADIOACTIVE MATERIALS

- Carrier Personnel
  - Training requirements
  - Physical requirements
  - Security
  - Radiation Safety
- Acceptance of Consignment
  - Package condition
  - Hazard Communications
  - Documentation
- Load Securement
  - Blocking & bracing
  - Tie-downs

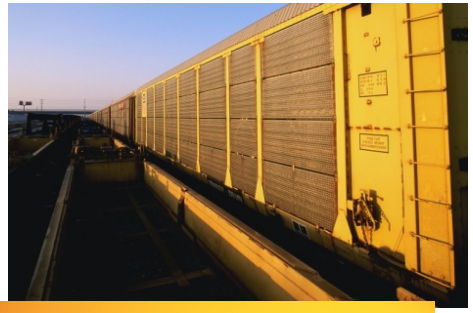
49 CFR 173.448(a); 174-177; 49 CFR 383-389; 10 CFR 71.0; 71.5

IN-TRANSIT DAMAGED OR LEAKING PACKAGE

- Restrict access to the package
- Assess extent of any contamination or resultant radiation levels of the:
  - Package
  - Conveyance
  - Adjacent areas
  - Other materials in conveyance (as needed)
- Comply with Competent Authority's directions for additional protection of persons, property, and environment

MODAL SPECIFIC REQUIREMENTS

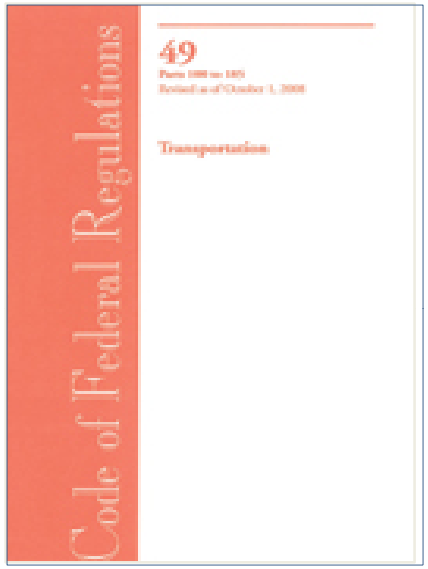
- Radioactive materials transport requirements incorporated into various modal regulations
  - Rail: 49 CFR 174.700
  - Aircraft: 49 CFR 175.705
  - Vessel: 49 CFR 176.700
  - Highway: 49 CFR 177.842

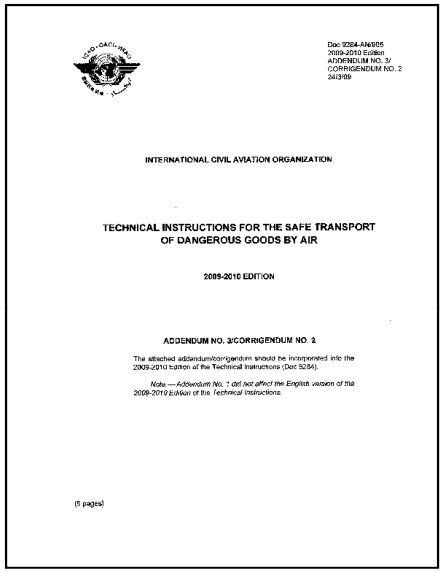


SPECIFIC MODAL RESTRICTIONS

TRANSPORT BY AIR

- Domestic
  - 49 CFR 100-185
  - ICAO TI
- International
- ICAO TI
  - ICAO TI
    - Revised bi-annually
    - Implemented by airlines through IATA DGR
  - 49 CFR §§ 171.22; 23; 24
  - 49 CFR 175





ICAO not really used
ICAO put into IATA

PROPOSED RULE

AMEND 10 CFR 71 and 73

- Applicability:
  - Licensees that ship irradiated reactor fuel or other radioactive wastes listed in 10 CFR 71.97.
  - Licencees to provide advance notice of certain waste shipments before crossing the border of Tribal reservations.
  - Notification to be made in writing [§71.97(c)]
- Implementation: effective 1 year after publication in the *Federal Register*.

Request for Comments on the Draft Proposed Rule (Dtd March 10, 2010)
Pre-decisional Draft Information: Advance Notification to Native American Tribes of Transportation of Certain Types of Nuclear Waste (RIN: 3150-AG41)

PROPOSED RULE

AMEND 10 CFR 71 and 73

- Advance notification provisions apply if the quantity of licensed material in a single package exceeds the *least* of the following:
  - 3000 times the A_1 value of the radionuclides as specified in Appendix A, Table A-1 of 10 CFR Part 71, for special form radioactive material;
  - 3000 times the A_2 value of the radionuclides as specified in Appendix A, Table A-1 of 10 CFR Part 71, for normal form radioactive material; or
  - 1000 Terabequerel (TBq) (27,000 curies).

PROPOSED AMENDMENTS

AMEND 10 CFR 71 and 73

- Definitions (§71.4 & §73.2): Indian Tribe and Tribal Official
- Amend §71.97: Advance notification of shipment of irradiated reactor fuel and nuclear waste.
- Amend §73.21: Protection of Safeguards Information: Performance Requirements.
- Amend §73.37: Requirements for physical protection of irradiated reactor fuel in transit.
- Amend §73.59: Relief from fingerprinting, identification and criminal history records checks and other elements of background checks for designated categories of individuals.