

# **United States Hazardous Materials Instructions for Rail**

**Jan. 20, 2022  
Update**

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The **United States Hazardous Materials Instructions for Rail** should be interpreted and used as general guidelines. For further information, appropriate regulations must be consulted.

The Association of American Railroads (AAR) and the AAR Hazardous Materials Committee are not responsible for any omissions or errors found in the **United States Hazardous Materials Instructions for Rail**.

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# INTRODUCTION

## 1. Purpose

One of the rail industry's primary focuses continues to be the safe transportation of hazardous materials. Rail employees interact regularly with employees of other railroads. If subscribing railroads implement and consistently apply a standard set of rules and regulations, we will significantly enhance both our employees' safety and the safety of the communities through which we operate. Those railroads involved in developing the **United States Hazardous Materials Instructions for Rail** therefore worked together to create these instructions for employees who transport hazardous materials.

**Note:** These general guidelines may be appropriately modified by an individual railroad to be consistent with its unique operating rules and practices.

## 2. Policy

To handle hazardous material shipments or incidents safely and efficiently, without delay, and in accord with local, state, and federal regulations, it is imperative that you familiarize yourself with the **United States Hazardous Materials Instructions for Rail**, in addition to other operating rules. These instructions provide guidance on how to perform your duties so that both you and the company will comply with Department of Transportation (DOT) regulations.

Employees who transport hazardous materials must also have a copy of the current **Emergency Response Guidebook** (ERG) readily accessible while on duty.

The company will provide appropriate training and testing to each employee who directly affects hazardous material transportation safety.

Always keep in mind that the company requires full compliance with the law. Compliance with the letter and spirit of our obligations is good corporate citizenship and is basic to achieving quality in all areas of our operations. Each employee has a duty to see that the railroad's actions are consistent with the highest legal and ethical standards.

## 3. Questions

For questions about the **United States Hazardous Materials Instructions for Rail**, contact your immediate supervisor and/or your railroad's Hazardous Materials / Dangerous Goods representative.

## 4. Print Date/Version

Effective: 10/18 /2021

## 5. Regulatory Updates, Additions and Corrections

Requests should be submitted via email to the Association of American Railroads' Hazardous Materials Committee for review. (BOE@aar.org) If approved, changes will occur in the next publication of the **United States Hazardous Materials Instructions for Rail**.

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## SECTION I. GENERAL INFORMATION

### 1. Definition of Hazardous Materials:

The U.S. Department of Transportation (DOT) and the International Air Transportation Association (IATA) define hazardous materials as articles or substances which are capable of posing a risk to health, safety, property, or the environment; are listed or classified in the regulations; and are transported in commerce.

**Table 1. Hazard Classes and Divisions**

<p><b><i>Numbered Hazard Classes and Divisions</i></b></p> <p><b>Explosives – <u>Class 1</u></b></p> <ul style="list-style-type: none"><li>1.1 – Explosive with mass explosion hazard</li><li>1.2 – Explosive with projection hazard</li><li>1.3 – Explosive with predominantly fire hazard</li><li>1.4 – Explosive with no significant blast hazard</li><li>1.5 – Very insensitive explosive; blasting agent</li><li>1.6 – Extremely insensitive detonating substance</li></ul> <p><b>Gases – <u>Class 2</u></b></p> <ul style="list-style-type: none"><li>2.1 – Flammable gas</li><li>2.2 – Nonflammable, nonpoisonous (nontoxic) compressed gas</li><li>2.3 – Gas poisonous (toxic) by inhalation</li></ul> <p><b>Flammable Liquids – <u>Class 3</u></b></p> <p><b>Combustible Liquids - <u>Worded Hazard Class</u></b></p> <ul style="list-style-type: none"><li>• Regulated in the US only</li></ul> <p><b>Flammable Solids and Reactive Solids/Liquids – <u>Class 4</u></b></p> <ul style="list-style-type: none"><li>4.1 – Flammable solid</li><li>4.2 – Spontaneously combustible material</li><li>4.3 – Dangerous when wet material</li></ul> <p><b>Oxidizers and Organic Peroxides – <u>Class 5</u></b></p> <ul style="list-style-type: none"><li>5.1 – Oxidizer</li><li>5.2 – Organic peroxide</li></ul> <p><b>Poisonous (Toxic) Materials and Infectious Substances – <u>Class 6</u></b></p> <ul style="list-style-type: none"><li>6.1 – Poisonous (toxic) material</li><li>6.2 – Infectious substance</li></ul> <p><b>Radioactive Materials – <u>Class 7</u></b></p> <p><b>Corrosive Materials – <u>Class 8</u></b></p> <p><b>Miscellaneous Hazardous Materials – <u>Class 9</u></b></p>
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## 2. General DOT Requirement

- a. No person may offer, accept, or transport a hazardous material in commerce unless that material is properly classed, described, packaged, marked, labeled, and placarded and is in proper condition for transportation according to DOT and International regulations.
- b. No person may transport a hazardous material in commerce unless the hazardous material is handled and transported according to DOT regulations.

## 3. Expediting Hazardous Material Shipments

Loaded hazardous material shipments and both loaded and residue/empty time-sensitive shipments (see Table 2) must be forwarded either:

- a. within 48 hours (excluding Saturdays, Sundays, and holidays) after accepting them at the shipper's facility or receiving them in any yard, intermediate (transfer) station, or interchange point  
**or**
- b. when only bi-weekly or weekly service is performed, on the first available train toward the destination.

**Exception:** The 48-hour requirement does not apply to shipments that are constructively placed or set out for repairs.

**Table 2. Time-Sensitive Shipments**

<p><b>20 Day</b></p> <ol style="list-style-type: none"><li>(1) Ethylene, refrigerated liquid – UN 1038</li><li>(2) Hydrogen, refrigerated liquid – UN 1966</li><li>(3) Chloroprene, stabilized – UN 1991</li><li>(4) Flammable Liquid, n.o.s. (Methyl Methacrylate Monomer, uninhibited) – UN 1993</li><li>(5) Hydrogen chloride, refrigerated liquid – UN 2186</li><li>(6) Vinyl Fluoride, stabilized – UN1860</li></ol> <p><b>30 Day</b></p> <ol style="list-style-type: none"><li>(1) Styrene monomer, stabilized – UN 2055</li></ol>
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## 4. Exceptions for U.S. Government Material

- a. Department of Energy (DOE) and Department of Defense (DOD) shipments made for the purpose of national security and accompanied by escorts (personnel specifically designated by or under the authority of DOD or DOE) are not subject to DOT regulations or these instructions.
- b. Escorts must travel in a separate transport vehicle from the rail car carrying the hazardous materials.
- c. The escorts must have, in their possession, a document certifying that the shipment is for the purpose of national security.

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## SECTION II. REQUIRED DOCUMENTATION

### 1. General Requirements

No person may accept a hazardous material for shipment by rail transportation or transport a hazardous material in a train unless a member of the crew has each of the following documents:

- a. acceptable shipping documents
- b. acceptable emergency response information
- c. a document showing the current position of the hazardous material shipment in the train.

**Notes:**

- 1) The purpose of this documentation is to provide railroad personnel and emergency response personnel with accurate information about the hazardous materials.

Therefore, keep all current hazardous material documents neat and orderly and ensure that they are available in case of an emergency or for inspection. Properly discard superseded documents to eliminate the possibility of confusing or inconsistent information.

- 2) Electronic documents are only acceptable with Railroads having authorization from DOT.

### 2. Acceptable Shipping Documents

Any one of the following documents is an acceptable shipping document for hazardous material shipments, as long as it includes the required shipping description entries (see item 6 of this section), is legible, is printed (manually or mechanically in English), and, for multiple pages, is consecutively numbered with the first page indicating total number of pages.

- a. **Railroad-produced documents** – for example, train consists, train lists, wheel reports, waybills, industry work orders, or other similar documents
- b. **Customer-produced documents** – for example, bills of lading or switch lists
- c. **A connecting carrier's documents**
- d. **A hand-printed document** (printed, not cursive letters) – for example, radio waybills
- e. **A hazardous waste manifest.**

### 3. Acceptable Emergency Response Information

The **Emergency Response Guidebook** (ERG) contains acceptable emergency response information. The ERG may be supplemented by emergency response information printed as part of the train list/consist or provided by the customer – for example, a Safety Data Sheet (SDS).

### 4. Document Indicating Position in Train

Before moving hazardous material shipments in a train, a member of the crew must have a document that shows the current position in the train of each hazardous material shipment (loaded and residue/empty).

When making pickups or setouts, update the document before proceeding. The train crew must update the document electronically, by handwriting on it or by appending, or attaching another document to it.

### 5. Checking for Shipping Documents

Make sure that a member of the crew has acceptable shipping documents, with the required entries, for each hazardous material when:

- a. accepting hazardous material shipments at a customer's facility, interchange point, or other location
- b. moving hazardous material shipments in a train

- c. delivering hazardous material shipments to a customer's facility, interchange point, or other setout point
- d. switching hazardous material shipments outside a yard.

**Note:** Shipping documents are not required to be in the switch crew's possession when moving hazardous material shipments within a yard or at a customer's facility.

**Exception:** Although they may remain placarded and marked, residue/empty packages of Class 9 that are not hazardous substances, hazardous wastes or marine pollutants do not require hazardous material shipping documents and emergency response information.

## 6. Reviewing Shipping Document Entries

Review the shipping description entries for each hazardous material on the shipping documents and make sure that the following entries (a-g under this item) are present. (Figure 1 shows two formats for displaying the shipping description entries.)

<p><b>Vertical Format</b></p> <p>GATX 12345 <sup>(a)</sup>  1 T/C <sup>(b)</sup>  UN1830 <sup>(c)</sup>  SULFURIC ACID <sup>(d)</sup>  8 <sup>(e)</sup>  PG II <sup>(f)</sup>  RQ (SULFURIC ACID) <sup>(h3)</sup>  EMERGENCY CONTACT: 800-424-9300 <sup>(g)</sup></p> <hr/> <p><b>Horizontal Format</b></p> <p>UTLX 12345 <sup>(a)</sup>  1 T/C <sup>(b)</sup> // UN1017 <sup>(c)</sup> // CHLORINE <sup>(d)</sup> // 2.3 (5.1, 8) <sup>(e)</sup> // RQ (CHLORINE) <sup>(h3)</sup> // POISON-INHALATION HAZARD <sup>(h6)</sup> // ZONE B <sup>(h7)</sup> // MARINE POLLUTANT (CHLORINE) <sup>(h4)</sup> // EMERGENCY CONTACT: 800-424-9300 <sup>(g)</sup></p> <hr/> <p>Items <sup>(a)</sup> through <sup>(g)</sup> are required entries, and items <sup>(c)</sup> through <sup>(f)</sup> are referred to as the basic description. Item <sup>(h)</sup> refers to additional entries that may appear.</p>
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**Figure 1. Shipping Descriptions Entries**

- a. Reporting marks (initials) and numbers

The shipping document for a rail car, freight container, transport vehicle, or portable tank must include the reporting mark and numbers when the reporting mark and numbers are displayed on the rail car, freight container, transport vehicle, or portable tank.

- b. Total Quantity Notation

- (1) For empty packagings, bulk packagings, or cylinders of Class 2 materials, some indication of the total quantity must be shown (certain abbreviations are acceptable). For example, "1 T/C" (1 tank car), "1C/L" (1 car load), or "10 CYL" (10 cylinders).
- (2) For **non-bulk packaging**, the total quantity is given by both:
  - (a) weight or volume (including the unit of measure); for example, "100 LBS", "55 GAL", "5 KG", or "208 L"; and
  - (b) number and type of packages; for example "12 DRUMS", "12 UN 1A1", "15 4G", or "2 UN 3H1JERRICAN".
- (3) For Class 1 materials, the quantity must be the net explosive mass.

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c. Identification Number

A 4-digit number preceded by “UN”, “NA” or “ID” assigned to a hazardous material.

d. Proper Shipping Name

- (1) The proper shipping name of the hazardous material may be one or more words, such as “CHLORINE” or “SULFURIC ACID.” The proper shipping name may include a number that indicates the concentration of the material.
- (2) When a N.O.S. (Not Otherwise Specified) shipping name appears, the technical name of the product may appear in parentheses immediately after the N.O.S. shipping name, such as “CORROSIVE LIQUID, N.O.S. (CAPRYL CHLORIDE).”
- (3) Residue/empty shipments in tank cars must include the phrase “RESIDUE: LAST CONTAINED . . .” in association with the basic description, including the proper shipping name.
- (4) For waste shipments, the word “WASTE” will precede or be part of the proper shipping name of the material.

e. Hazard Class/Division – Numeric or Worded

**Reference:** For further information on hazard classes/divisions, see the definitions in the Glossary and the list of hazard classes/divisions in Table 1.

- (1) For certain hazardous materials, the subsidiary hazard class(es)/division(s) will appear in parentheses after the primary hazard class/division. For example, Ethylene Oxide is listed as “2.3 (2.1)”, and Chlorine is listed as “2.3 (5.1, 8)”.
- (2) The hazard class need not be repeated for “COMBUSTIBLE LIQUID, N.O.S.” shipments.
- (3) Divisions 1.1, 1.2, 1.3, 1.4, 1.5, and 1.6 will show a compatibility group letter after the division (“1.1A”). The letter has no significance in rail transportation.

f. Packing Group

The packing group, *when required by regulation*, will appear on the shipping documents in Roman numerals (“I”, “II”, or “III”). The packing group may be preceded by the letters “PG” (“PG I”, “PG II”, or “PG III”).

**Exceptions:**

Classes / Divisions 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 4.1 (self-reactive liquids or solids, types B-F), 5.2, 6.2 and Class 7 do not require the packing group notation.

In addition, there are specific commodities in Classes / Divisions 3, 4.2, 4.3, 5.1, 8 and 9 that do not require the packing group notation. If the Packing Group is not required, the field will be blank.

g. Emergency Response Telephone Number

Shipping documents for hazardous materials must show a 24-hour emergency response telephone number, including the area code, for use in the event of an emergency involving the hazardous materials. For telephone numbers outside the United States, the international access code or the “+” (plus) sign, country code, and city code, as appropriate, must be included.

**Note:** In some cases, a shipper name or contract number may be shown before or after the emergency response telephone number.

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**Exceptions:** Emergency response telephone numbers are not required when the hazardous material is shown as “LIMITED QUANTITY”, “LTD QTY”, or its proper shipping name is:

- (1) battery powered - equipment or vehicle
- (2) carbon dioxide, solid or dry ice
- (3) castor - bean, meal, flake, or pomace
- (4) consumer commodity
- (5) engines, internal combustion
- (6) fish - meal or scrap, stabilized
- (7) fumigated unit
- (8) krill meal, PG III
- (9) refrigerating machine
- (10) vehicle, flammable gas powered or vehicle, flammable liquid powered
- (11) wheelchair, electric

h. Additional Entries

Some hazardous material shipping descriptions may contain one or more of these entries:

- (1) “RESIDUE: LAST CONTAINED ...” (for packages emptied to the maximum extent possible)
- (2) “HOT” notation added before a proper shipping name for elevated temperature materials
- (3) “RQ” for Reportable Quantity notation of a hazardous substance
- (4) “MARINE POLLUTANT” notation
- (5) “POISON” or “TOXIC” notation
- (6) “POISON (TOXIC)-INHALATION HAZARD (PIH or TIH)” or “INHALATION HAZARD (IH)” notation
- (7) Hazard Zone notation (“ZONE A,” “ZONE B,” “ZONE C,” or “ZONE D”)
- (8) “LIMITED QUANTITY” or “LTD QTY” notation
- (9) FRA Movement Approval ( “FRA 0109123”), DOT Special Permit ( “DOT- SP 9271”), Special Approval Number ( “SA 920403”), or Competent Authority Number ( “CA 9701001”)
- (10) DOT-113 notation (“DOT-113, DO NOT HUMP OR CUT OFF IN MOTION”)
- (11) Hazardous Materials Response Code (Hazmat STCC “48xxxxx” or “49xxxxx”)
- (12) certain shipments described using Canadian regulations may contain both an Emergency Response Assistance Plan number and its activation telephone number ( “ERAP-2-1008 (800-555-5555) // SPECIAL COMMODITY”)
- (13) box of asterisks with or without wording (not required by DOT, but may appear on railroad-produced documents)

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*****  
*           HAZMAT           *  
*****
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- (14) Shipper's Certification (Not required for residue shipments)
- (15) “OIL” notation
- (16) additional radioactive material entries
- (17) name and address of the place of business in Canada of the consignor
- (18) additional hazardous waste shipping description entries (see Section II, item 11, a)
- (19) EX number for air bag modules classified as Class 9. **Note:** Recycled air bag modules do not require the EX number entry, but must have the word “recycled” after the basic description.

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- (20) For International shipments, the notation "DANGEROUS GOODS IN EXCEPTED QUANTITIES" as appropriate
  - (21) "NON-ODORIZED" or "NOT-ODORIZED" notation for non-odorized liquefied petroleum gas

## 7. Handling Situations when Shipping Documents or Required Entries Are Not Available

When the appropriate shipping document is not present or when all required entries on the shipping document provided are not present:

- a. Do not move the car until the appropriate shipping document or the required entries on the shipping document are present.
- b. Take one of these three actions:
  - (1) Correct the existing document. Contact the customer or your supervisor, request the entries required to complete the shipping description, update the document electronically or legibly print those entries in the appropriate sequence (see Section II, item 6).

**or**
  - (2) Obtain the appropriate shipping document from the shipper, your supervisor, or other appropriate person.

**or**
  - (3) Use a radio waybill.
    - (a) Contact your supervisor or dispatcher and request the appropriate entries for a radio waybill (see Figure 2, Example of Radio Waybill).

The supervisor or dispatcher will provide the requested entries via radio or telephone to you.
    - (b) Complete the radio waybill using the information the supervisor or dispatcher provided.

**Note:** If a radio waybill form is not available, legibly print the required hazardous material information on a sheet of paper, including the car's initials and number (see Section II, item 6).
    - (c) Keep the radio waybill with the other shipping documents until either reaching the final destination or receiving another shipping document with the appropriate entries.
    - (d) For each radio waybill issued, add the car initial and number and its position on the position-in-train document.

## 8. Checking for Emergency Response Information

- a. When accepting and transporting hazardous material shipments, make sure a copy of the emergency response information for each shipment (see Section II, item 3) is available.
- b. If emergency response information is **not** available, do **not** accept or transport the car.

## 9. Checking for Position-in-Train Document

- a. When transporting hazardous material shipments in a train, make sure a member of the crew has a document indicating the current position in train of each hazardous material shipment.
- b. If the document indicating the current position in train of each hazardous material is **not** available:
  - (1) Update the documents already in your possession.

**or**
  - (2) Create a hand-printed list showing the position in train of each hazardous material shipment.

**Note:** The list must show the reporting marks and number for each hazardous material shipment in the train and its actual position in the train.

Hazardous Material Radio Waybill

NOTE: Print legibly

HAZARDOUS MATERIAL

- 1. Train Number \_\_\_\_\_
- 2. Number of Cars from Head End \_\_\_\_\_
- 3. Car Initial & No. \_\_\_\_\_
- 4. Total Quantity Notation (Circle One)  
Tank Car or Car Load or Residue: Last Contained or Other  
If Other, specify weight or volume \_\_\_\_\_
- 5. Number of Packages or Car(s) \_\_\_\_\_

\*\*\* Description of Articles \*\*\*

- 6. Identification No. (UN/NA) \_\_\_\_\_
- 7. Proper Shipping Name \_\_\_\_\_  
\_\_\_\_\_
- 8. Technical Name ( \_\_\_\_\_ )
- 9. Primary Hazard Class \_\_\_\_\_  
Subsidiary Hazard Class(es) ( \_\_\_\_\_ )
- 10. Packing Group (PG): I II III (Circle One)
- 11. Reportable Quantity (RQ): ( \_\_\_\_\_ )

\*\*\* Additional Information \*\*\*

- 12. Poison/Toxic Inhalation Hazard:  
Zone A, Zone B, Zone C, Zone D (Circle One)
- 13. Marine Pollutant ( \_\_\_\_\_ )
- 14. DOT Special Permit Number(s):  
\_\_\_\_\_
- 15. Additional Information \_\_\_\_\_  
\_\_\_\_\_
- 16. ERAP Plan No.: \_\_\_\_\_  
(Canadian Shipments Only)
- 17. ERAP Telephone No.: ( \_\_\_\_\_ ) - \_\_\_\_\_  
(Canadian Shipments Only)
- 18. Emergency Contact ( \_\_\_\_\_ ) - \_\_\_\_\_  
Contract Number or Shipper Name:

Completed:  
Date \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Time: \_\_\_\_ : \_\_\_\_  
MO DAY YR 24-HR MIN

Figure 2. Example of Radio Waybill

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## 10. Handling Shipping Documents Received from a Customer

When picking up a hazardous material shipment from the customer and the customer provides the original shipping documents:

- a. Check for appropriate hazardous material entries.
- b. For loaded shipments, make sure that the shipper's certification and signature (signature by hand or mechanical means) are on the shipping documents received from the customer.

## 11. Handling Hazardous Waste Shipping Documents and Manifests

- a. The shipping document for a hazardous waste shipment must have the following entries in addition to the the required term "waste" before or after the proper shipping name:
  - (1) proper shipping description
  - (2) name, address, and telephone number of the hazardous waste generator
  - (3) name and address of the hazardous waste disposal facility
  - (4) name of transporter
  - (5) waste manifest number
  - (6) special handling instructions.
- b. When accepting a hazardous waste shipment **with** railroad generated shipping documents for the shipment which contains the hazardous waste manifest entries [(a) above], pick up the car containing hazardous waste without a copy of the hazardous waste manifest.
- c. When accepting a hazardous waste shipment **without** railroad shipping documents for the shipment, check to see that the hazardous waste manifest contains both the hazardous materials shipping description entries (see Section II, item 6, a-g) and the hazardous waste manifest entries [(a) above].

If all entries are present on the hazardous waste manifest, pick up the car containing hazardous waste with the copy of the hazardous waste manifest.

## 12. Handling Requests for Shipping Documents or Emergency Response Information

When receiving a request for shipping documents or emergency response information from a railroad employee, regulatory enforcement officer, or emergency response personnel in an emergency:

- a. Immediately share any requested information document for the shipment.

(Provide an extra copy of the train list/consist, when available.)

**Note:** Retain any waybills and a copy of the train list/consist until you can deliver them to the first railroad manager on the scene.

**and**

- b. Immediately share a copy of the emergency response information provided with the shipment.

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## SECTION III. INSPECTION

### 1. General Requirements

- a. To determine that they are in acceptable condition for transportation, all loaded and residue/empty hazardous material shipments must be inspected at these points:
  - (1) before accepting them from the shipper
  - (2) when receiving them in interchange

**Note:** Run-through trains received in interchange may continue to the next inspection point before being inspected.
  - (3) when placing them in a train
  - (4) at other points where an inspection is required.
- b. Accept or transport only those hazardous material shipments that conform to these instructions.

### 2. Inspection Procedures

In addition to inspecting rail cars for compliance with train make-up, adequate buffer cars, shiftable loads and temperature control equipment (see Position-In-Train Chart, Instructions 1 through 5) as well as mechanical requirements, visually inspect each loaded or residue/empty hazardous material shipment (including flat cars transporting placarded or marked trailers or containers) and adjacent rail cars, **from ground level** (do not climb on or go under the car) and check for:

- leakage and/or visible product on the outside of the car
- required placards and markings, including stenciling, car certificates, and qualification dates (See section IV for details)
- closures are secure, including but not limited to bottom outlet caps, bottom outlet valve handles, protective housing covers and manway cover securement bolts
- signs of tampering, such as suspicious items or items that do not belong, the presence of an "Improvised Explosive Device" (IED), and other signs that the security of the car may have been compromised

**Note:** Where an indication of tampering or a foreign object is found, take the following actions:

- (1) Do not accept or move the rail car.
  - (2) Immediately move yourself and others to a safe location away from the rail car before using radios and cell phones to make notifications.
  - (3) For cars at a customer's facility, immediately contact local plant personnel. If local plant personnel are not available or cannot correct the issue, immediately contact the train dispatcher (follow your specific railroad instructions).
  - (4) For cars on interchange tracks or in the yard, immediately contact the yardmaster or train dispatcher (follow your specific railroad instructions).
- a. Inspecting All Car Types (from ground level)
    - (1) Without climbing on the car, make sure that the hazardous material shipment is not leaking. Look for leaking contents – drips, wetness, odor or material on the car or on the ground.

**Note:** If you find a hazardous material shipment leaking, or if there is hazardous material residue / spillage on the outside of the car (excluding Molten Sulfur), follow the instructions in item 3 of this section and in Section VIII (Emergency Response), item 5.
    - (2) Make sure placards and markings are appropriate for the shipment and displayed correctly (see Section IV, Placards and Markings)
    - (3) Before accepting a hazardous material shipment from the shipper, make sure that:
      - (a) all customer loading and unloading lines are disconnected
      - (b) derails, chocks, and blue flags are removed

- 
- (c) all platforms are raised or in the clear.
  - b. Inspecting Placarded/Marked Tank Cars (from ground level)

Check placarded tank cars or tank cars marked with an identification number to see that:

    - (1) Insure that it is not leaking.
      - (a) Look for wetness or accumulation of the material.
      - (b) Look for a vapor cloud.
      - (c) Listen for hissing sounds of the contents escaping.

**Note:** If you find a hazardous material shipment leaking, or if there is hazardous material residue / spillage on the outside of the car (excluding Molten Sulfur), follow the instructions in item 3 of this section and in Section VIII (Emergency Response), item 5.
    - (2) protective housing covers are closed
    - (3) manway cover swing bolts are up and in place
    - (4) all valves, valve handles and fittings appear to be closed and secure
    - (5) visible plugs or caps (including bottom outlet caps) or other fittings are securely in place

**Note:** When heater coil caps are provided, they must be applied.

    - (6) “Double shelf” couplers are present for all tank cars.
  - c. Inspecting Placarded/Marked Gondola Cars (from ground level)
    - (1) Look for loosely fastened gondola covers.
    - (2) Make sure the cover or tie downs do not foul any safety appliances.
  - d. Inspecting Placarded/Marked Hopper Cars (from ground level)

Check that discharge gates and discharge caps are closed and secured.
  - e. Inspecting Shipments Placarded EXPLOSIVES 1.1 or 1.2 (from ground level)
    - (1) In addition to the other inspection requirements in this section, for shipments placarded EXPLOSIVES 1.1 and 1.2:
      - (a) Look for indications of damage to the contents.
      - (b) Make sure that completed “car certificates” (see Figure 3, Car Certificates) are displayed on both sides of the rail car. Car certificates must be removed after the rail car, trailer, or container is unloaded.
    - (2) Do not accept or transport the car until all damage has been corrected and car certificates are in place.

_____ Railroad	
No 1 _____	Station _____ 20 _____
_____ hereby certify that I have this day personally examined Car Number _____ and that the car is in condition for service and complies with the FRA Freight Car Safety Standards (49 CFR Part 215) and with the requirements for freight cars used to transport explosives prescribed by the DOT Hazardous Materials Regulations (49 CFR Part 174)	
_____ Qualified Person Designated Under 49 CFR 215.11	
No 2 _____	Station _____ 20 _____
I have this day personally examined the above car and hereby certify that the explosives in or on this car, or in or on vehicles or in containers have been loaded and braced; that placards have been applied, according to the regulations prescribed by the Department of Transportation; and that the doors of cars so equipped fit or have been stripped so that sparks cannot enter.	
_____ Shipper or his authorized agent	
_____ Qualified Person Designated Under 49 CFR 215.11	
No 3 _____	Station _____ 20 _____
_____ I hereby certify that I have this day personally supervised the loading of the vehicles or containers on and their securement to the above car.	
_____ Shipper or railway employee inspecting loading and securement	
<i>Note 1: A shipper must decline to use a car not in proper condition.</i>	
<i>Note 2: All certificates, where applicable, must be signed.</i>	

**Figure 3. Car Certificates**

f. Inspecting Placarded/Marked Intermodal Shipments (from ground level)

In addition to completing other inspection requirements in this section:

- (1) Make sure that an intermodal tank container of hazardous material is not transported with a container above or below the tank.
- (2) Make sure that placards are fully visible when containers are loaded in a well car.
- (3) Make sure that an intermodal tank container of hazardous material has the Proper Shipping Name on both sides, is legible and visible when the container is loaded in a well car.
- (4) Make sure that intermodal tank containers are placed so that the bottom outlet valves are pointed toward the ends of the well or platform.

**3. Handling Defects**

When a hazardous material shipment does not appear to be properly prepared for transportation:

- a. Do not accept or pull the hazardous material shipment or allow it to continue in transportation.
- b. Notify the customer, train dispatcher, yardmaster, or your immediate supervisor, as appropriate, and explain the problem.

---

## SECTION IV. PLACARDS AND MARKINGS

### 1. General Requirement

Hazardous material shipments, whether loaded or containing a residue, must **not** be accepted for transportation or transported unless they are properly placarded and marked. Not all hazardous material shipments require placards.

### 2. Placard Requirements

Each bulk packaging, freight container, transport vehicle, or rail car containing hazardous material must be placarded on each side and each end in accordance with the instructions below.

**Note:** Unless the shipping documents indicate that the shipment is a Limited Quantity, most international shipments (including Canada and Mexico) of hazardous materials require placards.

**Placard** - a sign measuring at least 250 mm (9.8 in) by 250 mm (9.8 in) square-on-point, communicating a hazard by symbol, color, hazard class/division number and possibly text (see Figure 4 for pictures of placards). Text indicating the hazard is not required on placards other than the Class 7 and DANGEROUS placards; however, for shipments originating internationally, text may not appear on a Class 7 placard. The hazard class text does not have to be in English, except for the DANGEROUS placard, as long as the size, color, hazard class, and symbol are correct.

- a. Placards are required when transporting **any quantity** (bulk or non-bulk) of these hazard classes:
  - 1.1 Explosive with mass explosion hazard
  - 1.2 Explosive with projection hazard
  - 1.3 Explosive with predominantly fire hazard
  - 2.3 Gas poisonous (toxic) by inhalation
  - 4.3 Dangerous when wet material
  - 5.2 Organic peroxide, Type B, liquid or solid, temperature controlled
  - 6.1 Material poisonous (toxic) by inhalation
  - 7 Radioactive Yellow III label or exclusive use shipments of low specific activity (LSA) materials and surface contaminated objects.
- b. Placards are required when transporting total weight of 1001 lbs (454 kg) or more (bulk or non-bulk) of these hazard classes:

**Note:** Placards may be displayed for a total weight less than 1001 lbs of these materials, as long as they are appropriate for the shipment.

- 1.4 Explosive with no significant blast hazard
  - Note:** Placards are not required for Class 1.4S materials.
- 1.5 Very insensitive explosive; blasting agents
- 1.6 Extremely insensitive detonating substances
- 2.1 Flammable gas
- 2.2 Nonflammable, nonpoisonous (nontoxic) compressed gas
- 3 Flammable liquid
- 4.1 Flammable solid
- 4.2 Spontaneously combustible material
- 5.1 Oxidizer
- 5.2 Organic peroxide, other than "organic peroxide, Type B, liquid or solid, temperature controlled" in 2a above
- 6.1 Poisonous (toxic) material, (other than material poisonous (toxic) by inhalation)
  - Note:** For U.S. transportation of Class 6.1 PG III materials, a PG III placard may be used in place of a POISON (TOXIC) placard.
- 8 Corrosive material

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9 Miscellaneous hazardous material.

**Exception:** For U.S. transportation only, Class 9 placards are not required for non-bulk shipments. However, bulk shipments of Class 9 materials transported in the US one of the following is acceptable:

- 1) Class 9 placard with identification number
- 2) White square-on-point configuration containing the identification number
- 3) Orange panel containing the identification number.  
(see Section IV, item 4).

c. Placards are not required for:

- (1) Hazardous material shipments with less than 1001 lbs (454 kg) total weight, provided the hazard classes are included in item b above
- (2) Class 6.2 (Infectious Substances)
- (3) Class 9 (US/Canadian transportation) materials that display the identification number
- (4) Limited Quantity (LTD QTY) shipments when identified as such on shipping documents
- (5) Cryogenic atmospheric gases, other than Oxygen (Argon, Carbon Dioxide, Nitrogen)
- (6) Combustible liquids in non-bulk packaging (i.e., drums), usually found in intermodal shipments, unless the material is a hazardous substance or hazardous waste
- (7) Rail cars and intermodal tank containers of hazardous materials which have been cleaned and purged
- (8) Shipments listed as Radioactive White I and Radioactive Yellow II on shipping documents
- (9) Class 1.4S
- (10) Shipments of molten sulfur moving to or from Canada, provided the letters and numerals "UN2448", or the numerals "2448" and the words "MOLTEN SULFUR" (or "MOLTEN SULPHUR") appear on each side of the tank car.

d. Placards may be displayed for hazardous materials, even when not required, as long as the placard is appropriate for the contents of the shipment. If displayed, then all instructions for that placard apply.

e. Certain hazard classes require the display of the primary placard on a white square background, including (see Figure 4, Placard Chart): *(when required to be affixed to the rail car)*

- (1) Class 1.1 or 1.2 explosives
- (2) Class 2.3 or 6.1 poison/toxic inhalation hazard zone A material
- (3) Class 2.1 flammable gases loaded in DOT-113 tank cars, including tank cars containing only a residue of the material.

f. The DANGEROUS placard may be used instead of separate placards for each hazard class when a rail car, trailer, or container is loaded with non-bulk packages of two or more hazard classes from this section's item 2b.

**Note:** When 2205 lbs (1000 kg) or more of one hazard class is loaded at one loading facility, the placards for that hazard class as specified in item 2b of this section must also be applied.

g. Some shipments of hazardous materials require subsidiary placards that represent secondary hazards. Subsidiary placards must not display a 4-digit identification number, but will display the hazard class or division number.

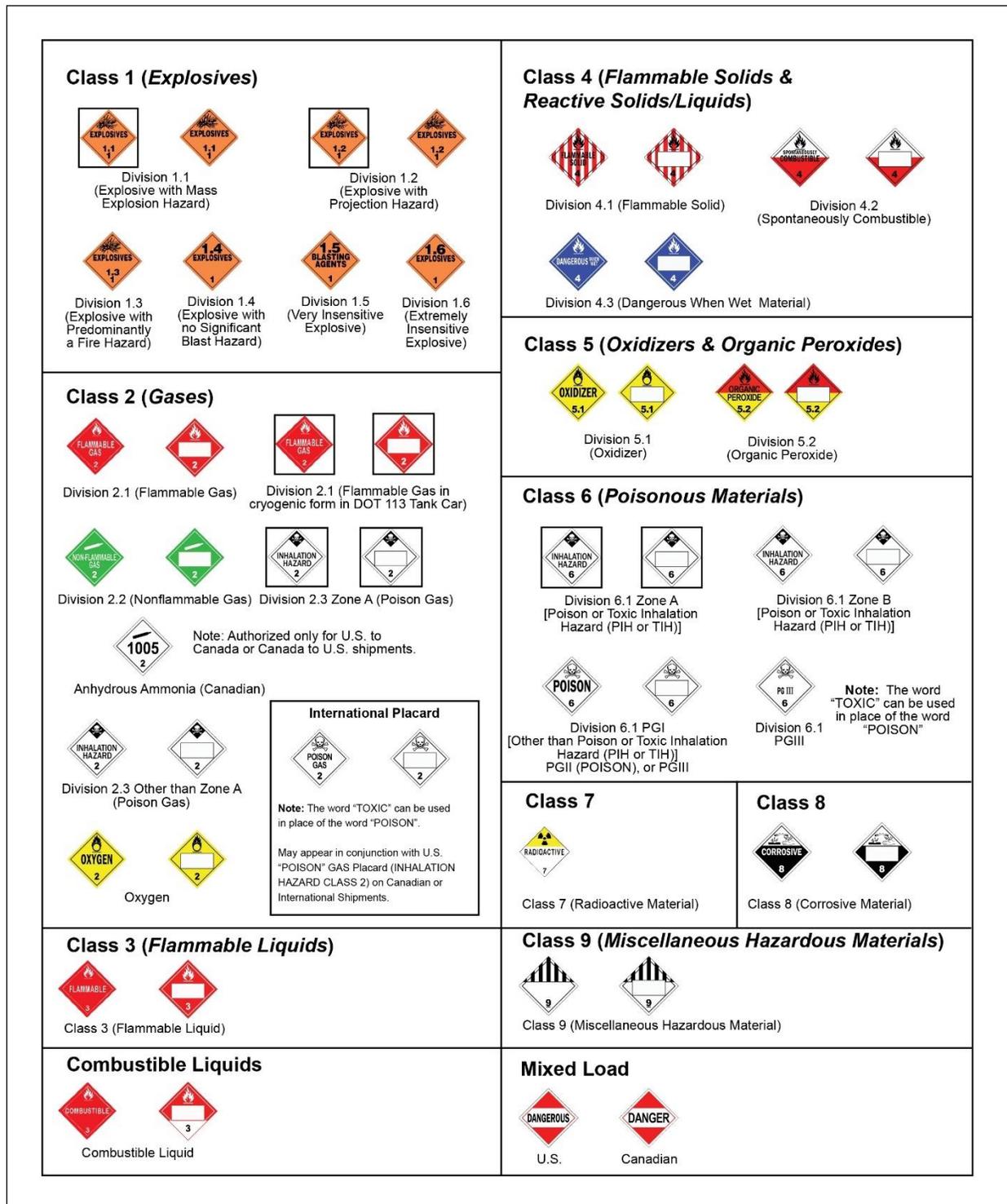
**Note:** Subsidiary placards must be displayed when the subsidiary hazard class is 2.3, 4.3, or 6.1 with the notation "POISON-INHALATION HAZARD" or "TOXIC-INHALATION HAZARD" present on the shipping documents.

h. For residue/empty hazardous materials shipments, the rail car, trailer, or container must remain placarded in the same manner as the loaded shipment, unless the packaging:

- 
- (1) has been cleaned of residue; or
  - (2) has been purged of vapor to remove any hazard; or
  - (3) has been refilled, with a material requiring different placards or no placards, to such an extent that any residue remaining in the packaging is no longer hazardous.
  - (4) contains a residue of an elevated temperature material. These shipments may remain placarded in the same manner as when it contained a greater quantity of the material even though the material no longer meets the definition for an elevated temperature material.
  - (5) contains a residue of a hazardous substance, Class 9, that does not meet the definition of another hazard class and is not a hazardous waste or marine pollutant. These shipments may remain marked, labeled, and/or placarded in the same manner as when it contained a greater quantity of the material even though the material no longer meets the definition for a hazardous substance.

### **3. Inspecting for Placards**

- a. Make sure that all required placards are:
  - (1) consistent with the shipping document information
  - (2) on both sides and both ends of the shipment
  - (3) matching on both sides and both ends of the shipment and when required the UN/NA numbers all match
  - (4) in placard holders or securely attached to the rail car, trailer, or container
  - (5) not damaged, faded - color should be similar to the color printed in this document (see Figure 4, Placard Chart), or obscured by dirt or car part
  - (6) oriented horizontally, so you can read them from left to right
  - (7) readily visible from the direction they face, except for placards on the ends of trailers and containers in or on a rail car.



**Figure 4. Placards for Hazardous Materials by Hazard Class**

Text indicating the hazard is not required on placards other than the Class 7 and DANGEROUS placards; however, for shipments originating internationally, text may not appear on a Class 7 placard. The hazard class text does not have to be in English, except for the DANGEROUS placard, as long as the size, color, hazard class, and symbol are correct.

- 
- b. When picking up a hazardous material shipment at the customer's facility or siding, and a placard is not correct, does not meet the standards above, or is missing:
    - (1) Notify the customer, train dispatcher, yardmaster, or your supervisor, as appropriate.
    - (2) Do not accept the hazardous material shipment until corrections have been made.
  - c. When a placard does not meet the standards above or is discovered missing en route, notify the train dispatcher, yardmaster, or your supervisor, as appropriate. Corrections must be made at the next inspection point.

#### 4. Marking Requirements and Inspecting for Markings

**Marking** - a descriptive commodity name, identification number, caution (such as inhalation hazard, elevated temperature material, marine pollutant, fumigant, non-odorized, sour crude oil), or tank car specification and qualification dates stencils displayed on hazardous material shipments.

Make sure the markings above are displayed on bulk packages as follows:

- a. Identification Number Markings
  - (1) Identification number markings must appear on both sides and both ends either on the placard or in close proximity to the placard, when a placard is required:
    - (a) Bulk packages of hazardous materials (including Class 9 when no placard is required)

**Note:** Identification number markings are not required on the ends of multi-compartmented tank cars transporting more than one hazardous material having different identification numbers.
    - (b) Rail cars, trailers, and containers when 8,820 lbs (4000 kg) or more of non-bulk packages of hazardous materials, with the same proper shipping name and identification number, are loaded at one location and the transport vehicle does not contain any other hazardous or non-hazardous materials.

**Exception:** For shipments of molten sulfur from Canada, the identification number marking must appear only on both sides of the tank car.
  - (2) Identification numbers can be displayed in one of three ways, as Figure 5 shows:

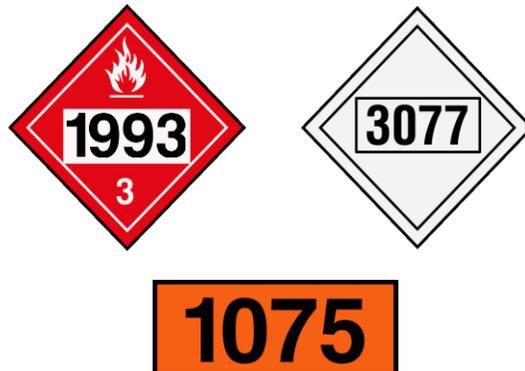


Figure 5. Identification Numbers

- 
- (3) Identification numbers must not be displayed on:
    - (a) EXPLOSIVES 1.1, 1.2, 1.3, 1.4, 1.5, or 1.6 placards
    - (b) RADIOACTIVE placards
    - (c) DANGEROUS placards
    - (d) Subsidiary placards
  - (4) Make sure the identification numbers appear as required above and agree with the shipping document entries.
  - (5) When picking up a hazardous material shipment at the customer's facility, a siding or an interchange point and the identification number is not correct, is not legible, or is missing:
    - (a) Notify the customer, train dispatcher, yardmaster, or your supervisor, as appropriate.
    - (b) Do not accept the hazardous material shipment until corrections have been made.
  - (6) When an identification number is not correct, is not legible, or is missing en route, notify the train dispatcher, yardmaster, or your supervisor, as appropriate. Corrections must be made at the next inspection point.

**Note:** Missing identification numbers must be replaced and may be entered on the appropriate placard, orange panel, or white square-on-point configuration by hand using a black indelible marker.

b. MARINE POLLUTANT Mark

- (1) For a material described on the shipping documents as a "MARINE POLLUTANT" and the shipment does not require a placard, make sure that the MARINE POLLUTANT mark (see Figure 6) appears on both sides and both ends of bulk packaging.



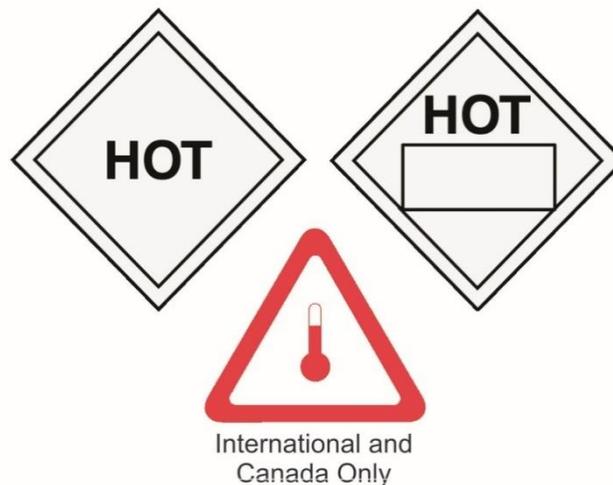
**Figure 6. MARINE POLLUTANT Mark**

**Note:** MARINE POLLUTANT marks are not required for DOMESTIC transportation when the bulk package displays a placard.

- (2) When picking up a hazardous material shipment at the customer's facility or siding or at an interchange point, and a required MARINE POLLUTANT mark is not legible or is missing:
  - (a) Notify the customer, train dispatcher, yardmaster, or your supervisor, as appropriate.
  - (b) Do not accept the hazardous material shipment until corrections have been made.
- (3) When a required MARINE POLLUTANT mark is not legible or is missing en route, notify the train dispatcher, yardmaster, or your supervisor, as appropriate. Corrections must be made at the next inspection point.

c. Elevated Temperature Material Mark

- (1) For a material described on the shipping documents with the words "HOT," "ELEVATED TEMPERATURE," or "MOLTEN" and transported in a bulk packaging, the elevated temperature material mark must be displayed on two opposing sides of the bulk packaging, in one of the following valid formats:
  - (a) the word HOT stenciled on the packaging itself
  - (b) the words MOLTEN SULFUR (or MOLTEN SULPHUR) or MOLTEN ALUMINUM (or MOLTEN ALUMINIUM), as appropriate, stenciled on the packaging itself
  - (c) the international elevated temperature material symbol (see Figure 7)
  - (d) the word HOT displayed on a plain white-square-on-point configuration having the same outside dimensions as a placard (see Figure 7).



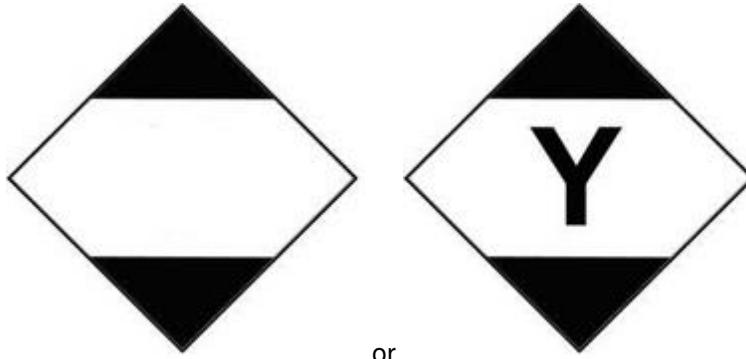
**Figure 7. Elevated Temperature Material Mark**

**Note:** Residue/empty shipments that last contained an elevated temperature material, such as asphalt, are not considered hazardous materials and do not require hazardous material shipping description entries on the shipping document. When the shipping document indicates empty, the shipment may be accepted and moved in rail transportation without the hazardous material shipping description entries, even though the elevated temperature material mark and identification number are displayed.

- (2) When picking up a hazardous material shipment at a customer's facility or siding or at an interchange point and an elevated temperature material mark is not legible or is missing:
  - (a) Notify the customer, train dispatcher, yardmaster, or your supervisor, as appropriate.
  - (b) Do not accept the hazardous material shipment until corrections have been made.
- (3) When an elevated temperature material mark is not legible or is missing en route, notify the train dispatcher, yardmaster, or your supervisor, as appropriate. Corrections must be made at the next inspection point.

d. LIMITED QUANTITIES Mark

- (1) For a material listed on the shipping documents as "LIMITED QUANTITY" or "LTD QTY", the LIMITED QUANTITIES mark (see Figure 8) must be displayed on at least one side or end of trailers/containers as explained below.



**Figure 8. LIMITED QUANTITIES Mark**

- (a) The LIMITED QUANTITIES mark is required:
    - (i) When the entire load of hazardous materials is limited quantities.
    - (ii) For a mix of non-hazardous materials and hazardous materials in limited quantity.
  - (b) The LIMITED QUANTITIES mark is not required when there are limited quantities and other hazardous materials NOT in limited quantities, but you would placard for the regular hazardous materials.
  - (2) A package displaying the LIMITED QUANTITIES mark is not subject to additional marking requirements for non-bulk packages (proper shipping name or identification number marking) unless it contains a hazardous substance or a hazardous waste.
- e. INHALATION HAZARD Mark
- (1) For a material described on the shipping documents as "POISON (TOXIC) – INHALATION HAZARD" or "INHALATION HAZARD," the words INHALATION HAZARD must appear (at least 3.9 inches in height for tank cars and at least 2 inches in height for intermodal tank containers) on both sides of the rail car, trailer, or container, near the placards.  
**Note:** When the words INHALATION HAZARD appear on the placards, the INHALATION HAZARD mark is not required on the bulk packaging.
  - (2) When picking up a hazardous material shipment at the customer's facility or siding or at an interchange point and the words INHALATION HAZARD are illegible or missing:
    - (a) Notify the customer, train dispatcher, yardmaster, or your supervisor, as appropriate.
    - (b) Do not accept the shipment until corrections have been made.
  - (3) When the INHALATION HAZARD marking is illegible or missing en route, notify the train dispatcher, yardmaster, or your supervisor, as appropriate. Corrections must be made at the next inspection point.
- f. Commodity Name
- (1) For intermodal tank containers transporting any hazardous materials and for tank cars transporting certain hazardous materials, the commodity name must appear on two opposing sides of the intermodal tank container or tank car. The commodity name (at least 3.9 inches in height for tank cars and at least 2 inches in height for intermodal tank containers) must match the proper shipping name on the shipping documents and may include the technical name, although it is not specifically required.
  - (2) When accepting an intermodal tank container or tank car of hazardous materials from the shipper or in interchange and the commodity name is illegible or missing:
    - (a) Notify the customer, train dispatcher, yardmaster, or your supervisor, as appropriate.
    - (b) Do not accept the shipment until corrections have been made.

- (3) When the commodity name on a tank car is discovered illegible or missing en route, notify the train dispatcher, yardmaster, or your supervisor, as appropriate. They will arrange to correct the problem at the next inspection point.

**Note:** See Appendix 1 for list of materials that require the commodity name on tank cars

g. Tank Car Specification and Qualification Dates Stencils

- (1) Make sure the stencils describing the tank car specification (DOT 111A100W1) and qualification dates are legible (see Figure 9). These stencils will appear on both sides of the tank car toward the end on the right as you face the car.
- (2) Make sure the tank car qualification dates for pressure relief devices (PRD), tank, and interior heater coils are current (a car is currently within the qualification date until the last day of the year shown) (see Figure 9).

**Note 1:** When the car is loaded before the end of the year, it may be transported for unloading purposes but must be requalified before reloading.

**Note 2:** A tank car containing the residue of a hazardous material that is overdue its periodic qualification date may move and not be in violation of DOT regulations. The regulations only address loading a tank car overdue for its periodic qualification.

**DOT 111A100W1**

		STATION STENCIL	QUALIFIED	DUE
TANK QUALIFICATION		ABC-1	2021	2031
THICKNESS TEST		ABC-1	2021	2031
SERVICE EQUIPMENT		ABC-1	2021	2031
PRD: Valve	75 PSI	DEF-1	2021	2031
INT HTR		FGL-1	2021	2031
LINING		ABC-1	2021	2031
88.B.2 INSPECTION		ABC-1	2021	2031
STUB SILL INSPECTION		ABC-1	2021	2031

**Figure 9. Tank Car Specification and Qualification Stencils**

- (3) When the qualification date is overdue, do not accept loaded tank cars from the shipper.
- (4) When found en route, car may proceed to destination after contacting your supervisor.

h. FUMIGANT mark

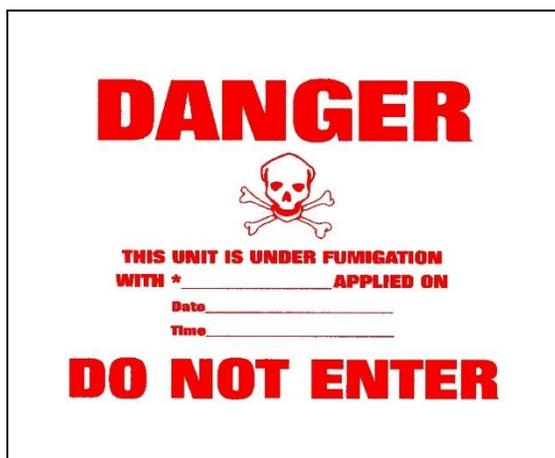
- (1) As information, the purpose of the FUMIGANT mark (see Figure 10) is to warn persons unloading the rail car, trailer, or container that it has been fumigated and that they must take appropriate precautions before unloading the car. The (\*) on the mark will be replaced by the name of the fumigant.
- (2) The FUMIGANT mark must be in English. However, EPA regulations allow another language in addition to the English version on the same FUMIGANT mark or an additional one.

**Note:** The FUMIGANT mark is required on each point of entry to a trailer/or container.

- (3) Shipping Description Entries
- (a) For U.S. shipments that are fumigated, information on the shipping documents is not required.
- (b) For International (Canadian and IMDG) shipments verify that the information for the shipment on the shipping documents includes the following entries - UN3359,

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Fumigated Unit, Class 9, name of the fumigant, amount of fumigant, date of fumigation, and any disposal information.



**Figure 10. FUMIGANT Mark**

i. Non - Odorized Mark

A tank car or intermodal tank container transporting non-odorized liquefied petroleum gas (LPG) must be legibly marked NON - ODORIZED or NOT - ODORIZED on two opposing sides, either near the commodity name or the placard(s).

The NON-ODORIZED or NOT - ODORIZED marks may appear on a tank car used for both non-odorized and odorized LPG.

Shippers must include on shipping documents information that a shipment is not odorized (i.e. provide "NON - ODORIZED" or "NOT - ODORIZED" notation).

j. Sour Crude Oil Mark

(1) US - A bulk packaging transporting petroleum crude oil containing hydrogen sulfide (i.e. sour crude oil) in sufficient concentration that its vapors may present an inhalation hazard must include a marking to warn of the toxic hazard (see Figure 11), which must be displayed at each location (manway) where exposure to hydrogen sulfide vapors may occur. The square-on-point must be black or red on a white or other contrasting background, and the skull and crossbones symbol must be black, located in the center of the square-on-point, and clearly visible



**Figure 11. Sour Crude Oil Mark**

(3) Canada - When bulk package of petroleum crude oil (UN1267 or UN3494) contains hydrogen sulphide in sufficient concentration that vapors from the crude oil can present an inhalation hazard, the words "toxic by inhalation" or "toxic — inhalation hazard" must be

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included next to the placard for the primary class (Class 3). The marking can be done by use of an inhalation hazard placard or by marking on the car.

## SECTION V. SWITCHING

### 1. General Requirement

Switch placarded hazardous material shipments only in compliance with the restrictions on the Switching Chart (see Figure 12).

**Switching** is defined as “the operation of moving rail cars within a yard in order to place them in a train or on a classification, repair, or storage track.” Switching also includes making pickups and setouts at a customer’s facility or interchange points. Switching does **not** include moving rail cars to or from a shipper’s facility or industry track into or out of the yard.

**Reminder:** When moving rail cars to or from a shipper’s facility or on an industrial lead into or out of the yard, comply with both the train placement restrictions in Section VI and the required documentation requirements in Section II.

**WHEN RAIL CARS ARE CUT OFF IN MOTION, THE COUPLING SPEED MUST NOT EXCEED 4 MILES PER HOUR.**

### 2. Safety

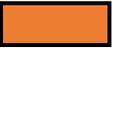
Before coupling, position yourself toward the end of a tank car, if possible, away from the manway and valves. Contents of tank cars may splash during or immediately following coupling, due to either improperly secured closures or the impact of coupling.

### 3. When to Use the Switching Chart

Refer to the Switching Chart:

- a. when moving placarded hazardous material shipments in a yard to place them in a train or on a classification, repair, or storage track
- b. when making pickups or setouts of placarded hazardous material shipments at a customer’s facility, interchange point, or other setout point.

# SWITCHING CHART

SWITCHING CHART								
GROUP A	GROUP B		GROUP C	GROUP D	GROUP E		GROUP F	
   	               		 	 <p style="font-size: small;">Note: Applies only to cars with spent nuclear fuel or high-level radioactive waste</p>  <p style="font-size: small;">DOT 113 Tank Car (Loads or Residue/Empty)</p>	    <p style="font-size: small;">Note: Only for Anhydrous Ammonia UN1005</p>  <p style="font-size: small;">*Anhydrous Ammonia (Canadian)</p>		       	<p style="text-align: center;"><b>HOW TO USE THIS CHART</b></p> <p>Select the applicable column and row on the Switching Chart. To do so:</p> <ol style="list-style-type: none"> <li>Identify the placards and/or markings applied to the car Note: When placards are displayed, but are not required by regulation (permissive placarding), the rail car must be switched as required for the placard displayed.</li> <li>Use the shipping document to determine whether car is loaded or residue/empty. Note: Residue/empty tank cars are identified on switch lists, track list, and track inquiries with an "E" or "DE" in the appropriate field. The notation "RESIDUE: LAST CONTAINED" on the shipping documents indicates a residue/empty shipment.</li> <li>Identify the car type involved by observation (e.g. tank car, hopper car, gondola, etc.).</li> <li>Find the applicable section on the chart, based on the placard or marking applied, the load/empty status, and the car type.</li> <li>Follow the restrictions associated with the placard or marking as the "X"s in the columns indicate.</li> </ol> <p style="color: red; font-size: small;">Note: The Word "TOXIC" can be used in place of the word "POISON" on placards.</p> <p style="font-size: small;">Cars with placards displaying 4-digit identification numbers will be handled the same as cars with word description placards.</p> <div style="text-align: center;"> <p><b>EQUIVALENT PLACARDS</b></p>  =  </div>
Any Car	Loaded Tank Car	Other Loaded Car	Any Loaded Car	Any Car	Loaded Tank Car	Other Loaded Car	Any Car	
<b>X</b>								
<b>X</b>		<b>**X</b>	<b>X</b>	<b>X</b>		<b>**X</b>		
					<b>X</b>			
	<b>X</b>				<b>X</b>			
							<ol style="list-style-type: none"> <li>Separate these cars from an engine by at least one non-placarded car or by one GROUP F placarded or marked car. Do not place where there is any probable danger of fire (e.g. switch heaters). Do not place under bridges, under overpasses or along passenger stations.</li> <li>These cars must not be: <ul style="list-style-type: none"> <li>Cut off in motion,</li> <li>Struck by any free rolling car, or</li> <li>Coupled into with more force than needed to make the coupling.</li> </ul> </li> <li>These cars must not be cut off in more than two car cuts. No more than two car cuts can couple into these cars.</li> <li>When a person must ride a rail car to operate the hand brake: <ul style="list-style-type: none"> <li>Verify the hand brake is working properly.</li> <li>Do not cut cars off until all preceding cars are clear of the lead.</li> <li>Do not cut off any additional cars until the lead is clear.</li> </ul> </li> </ol>	

\* Authorized only for U.S. to Canada or Canada to U.S. shipments.

\*\* Applies only to placarded flatcars, freight containers, trailers, portable tanks, tote bins, intermodal portable tanks, or U.N. portable tanks.

Figure 12. Switching Chart

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## SECTION VI. TRAIN PLACEMENT

### 1. General Requirement

Place placarded hazardous material shipments in a train so as to comply with the instructions on the Position-in-Train Chart (see Figure 13).

**Note:** Correct hazardous materials train placement errors at the first location that allows switching once the error is identified.

A **Train** is one or more engines coupled, with or without rail cars, displaying a marker, and requiring an appropriate air brake test.

### 2. When to Use the Position-in-Train Chart

Use the chart to make sure placement position in train is correct:

- a. before a train departs the initial terminal
- b. before a train departs an intermediate station where pickups and setouts were made en route
- c. when delivering cars to or picking cars up at interchange tracks that are owned and operated by another railroad.

### 3. General Information

- a. For train placement purposes, each platform or well of an intermodal rail car counts as one car.
- b. A buffer car is a:
  - (1) non-placarded rail car
  - (2) rail car with a placard or marking shown in Group E
  - (3) residue/empty tank cars may be used as a buffer but may not be placed against an engine that is working or not working, occupied caboose or business car. See Instruction # 2 on the Position-in-Train Chart
  - (4) placarded rail car and tank car, as long as it is in placard group E. See instruction #6 on the Position-in-Train Chart.
- c. The word TOXIC can appear in place of the word POISON on placards.
- d. A business car train is not a passenger train.
- e. An engine, working or not working and regardless of placement in train, is always considered as an engine for train placement of hazardous materials.



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## SECTION VII. KEY TRAINS

### 1. General Requirement

Trains carrying specified numbers of loaded rail cars, trailers, or containers of hazardous materials must be operated as “Key Trains.”

### 2. Key Train Definition

A “Key Train” is any train as described in either a, b, or c below:

- a. one (1) or more loads of spent nuclear fuel (SNF) or high level radioactive waste (HLRW) moving under the following Hazardous Materials Response Codes – 4929142, 4929143, 4929144, or 4929147

**or**

- b. one (1) or more loaded tank cars containing materials that require the phrase “POISON/TOXIC-INHALATION HAZARD” on the shipping documents (Hazard Zone A, B, C, or D), anhydrous ammonia (UN1005), or ammonia solutions (UN3318)

**or**

- c. twenty (20) or more loaded hazardous materials shipments or intermodal portable tank loads having any combination of hazardous material

**Exception:** Do not count box cars, trailers, or containers carrying mixed loads of hazardous materials when determining key train status.

### 3. Identifying Key Trains

- a. A computer-generated train consist/train list will identify Key Train status in the header block on the first page.
- b. When a computer-generated train consist/train list is not available or hazardous material cars are added to a train, the conductor must review the shipping documents for all hazardous material cars and determine Key Train status.
- c. After picking up or setting out hazardous material shipments **en route**, the Key Train status may change. The conductor must determine whether or not Key Train status has changed and, if so, promptly notify the train dispatcher.

### 4. Instructions for Operating Key Trains

- a. The maximum authorized speed for Key Trains is 50 MPH, unless further restricted.  
**Note:** Where lower speed restrictions are in effect, or when the train is restricted to a lower speed for other reasons, the lower speed governs.
- b. A key train will hold the main track, when practicable, unless a speed of greater than 10 MPH is authorized for the siding or auxiliary track.
- c. Only cars equipped with roller bearings will be allowed in a Key Train.
- d. When a defect in a Key Train is reported by a wayside/trackside warning detector but a visual inspection fails to confirm evidence of a defect, the train must not exceed 30 MPH until it has passed over the next wayside detector or is delivered to a terminal for a mechanical inspection. If the same car sets off the next detector or is found to be defective, it must be set out from the train.
- e. Unless relieved of the requirement to do so by the operating railroad’s train dispatcher, the crew operating a Key Train on a foreign railroad must, at the earliest opportunity, notify the foreign railroad’s train dispatcher that the train is a Key Train as defined by the operating railroad.

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## SECTION VIII. EMERGENCY RESPONSE

### 1. General Requirement

When an emergency occurs, SAFETY IS OF FIRST IMPORTANCE.

- a. Make an emergency call as radio rules require.
- b. Look for a fire, vapor cloud or other release of materials.
- c. Determine the status of crew members in the area.
- d. Warn and keep everyone at a safe distance.

### 2. When a Fire or Vapor Cloud is Visible

- a. Take the shipping documents (including the emergency response information) and the Emergency Response Guidebook and move yourself and other crew members uphill and upwind the evacuation distance recommended in the Emergency Response Guidebook. Stay out of ditches and low areas.
- b. Do not smoke or use fusees.
- c. Provide the train dispatcher or yardmaster with as much of the following information as is available:
  - (1) Specific location of the emergency (station, mile post location, nearest street or crossing)
  - (2) Type of emergency
  - (3) Status of crew members
  - (4) Cars involved, including each car's initials and numbers and their extent of involvement (leaking, derailed, or on fire)
  - (5) Surroundings (proximity to populated areas, local bodies of water, or nearby drainage ditches or storm sewers; description of terrain; location of access roads; weather conditions)
  - (6) Resources necessary to handle the situation (fire, ambulance, and law enforcement agencies)
  - (7) Location where a crew member with shipping documents will meet arriving emergency response personnel.
- d. Once you are in a safe location:
  - (1) Identify yourself and cooperate with the local emergency response personnel as described in Section VIII item 4.
  - (2) Review your shipping documents and emergency response information.
  - (3) If necessary, move to the farthest distance recommended in:
    - (a) information from the Emergency Response Guidebook
    - or
    - (b) other supplementary emergency response information printed as part of the train list/consist or provided by the customer – for example, a Safety Data Sheet (SDS).

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### 3. When No Fire or Vapor Cloud is Visible

- a. Review the shipping documents for hazardous material shipments.
- b. Take the shipping documents (including the emergency response information) and the Emergency Response Guidebook and inspect the train to identify the rail cars, trailers, or containers involved, and look for indications of the release of hazardous materials.
- c. If you encounter a hazardous material release, unusual smells, or noises during this inspection:  
Provide the train dispatcher or yardmaster with as much of the following information as is available:
  - (1) Specific location of the emergency (station, mile post location, nearest street or crossing)
  - (2) Type of emergency
  - (3) Avoid contact with the material and its vapors.
  - (4) Move yourself and other crew members uphill and upwind the evacuation distance recommended in the Emergency Response Guidebook. Stay out of ditches and low areas.
  - (5) Eliminate any ignition sources (no smoking, no fuses).
  - (6) Warn all bystanders to stay away.
- d. After completing the inspection, notify the train dispatcher or yardmaster with as much of this information as is available:
  - (1) Status of crew members
  - (2) Cars involved, including each car's initials and numbers and their extent of involvement (leaking, derailed, or on fire)
  - (3) Surroundings (proximity to populated areas, local bodies of water, or nearby drainage ditches or storm sewers; description of terrain; location of access roads; weather conditions)
  - (4) Resources necessary to handle the situation (fire, ambulance, and law enforcement agencies)
  - (5) Location where a crew member with shipping documents will meet arriving emergency response personnel.
- e. Once you are in a safe location:
  - (1) Identify yourself and cooperate with the local emergency response personnel as described in Section VIII item 4.
  - (2) Review your shipping documents and emergency response information.
  - (3) If necessary, move to the farthest distance recommended in:
    - (a) information from the Emergency Response Guidebook  
or
    - (b) other supplementary emergency response information printed as part of the train list/consist or provided by the customer – for example, a Safety Data Sheet (SDS).

### 4. Cooperating with Local Emergency Responders

- a. Immediately share any requested information from the shipping documents with emergency response personnel.
  - (1) Provide an extra copy of the train list/consist, when available.  
**Note:** Retain any waybills and a copy of the train list/consist until you can deliver them to the first railroad manager on the scene.
  - (2) Immediately share a copy of the emergency response information provided with the shipment.

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- b. Help emergency response personnel identify cars and the commodities involved. Use shipping documents or observations from a safe location to accomplish this task.
  - c. Give the first railroad manager on the scene a description of the incident and indicate any assistance you provided emergency responders.
  - d. Remain at the scene, at a safe distance, until a railroad manager relieves you.
  - e. A railroad spokesperson will handle discussing the incident with the media or other non-emergency response personnel.

#### **5. Handling Leaking Hazardous Material Shipments**

Take these actions when there is any sign of leakage:

- a. Do not allow the hazardous material shipment to continue in transportation until the leak is controlled.

Note: Leaking hazardous material shipments may be moved, with proper railroad authority, only as far as necessary to reduce or eliminate the immediate threat of harm to human health, the environment, or railroad operations. Movement of leaking hazardous material shipments may require government approval.

- b. When it is necessary to move a leaking hazardous material shipment, use an adequate number of buffer cars between the locomotive and the leaking car, to prevent chemical exposure.

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# APPENDICES

## 1. List of materials that require the commodity name on tank cars

Division 2.1 materials

Division 2.3 materials

Acrolein, stabilized

Ammonia, anhydrous, liquefied

Ammonia solutions (more than 50% ammonia)

Bromine or Bromine solutions

Bromine chloride

Chloroprene, stabilized

Dispersant gas or Refrigerant gas

Formic acid

Hydrocyanic acid, aqueous solutions

Hydrofluoric acid, solution

Hydrogen cyanide, stabilized (less than 3% water)

Hydrogen fluoride, anhydrous

Hydrogen peroxide, aqueous solutions (greater than 20% hydrogen peroxide)

Hydrogen peroxide, stabilized

Hydrogen peroxide and peroxyacetic acid mixtures

Nitric acid (other than red fuming)

Phosphorus, amorphous

Phosphorus, white dry or Phosphorus, white, under water or Phosphorus white, in solution, or Phosphorus, yellow dry or Phosphorus, yellow, under water or Phosphorus, yellow, in solution

Phosphorus white, molten

Potassium nitrate and sodium nitrate mixtures

Potassium permanganate

Sulfur trioxide, stabilized

Sulfur trioxide, uninhibited

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## GLOSSARY

**Note:** This glossary defines/explains the terms as used in this document.

**Basic description** – the identification number, proper shipping name, hazard class/division number, and packing group (if assigned) prescribed for a hazardous material.

**Buffer car** – a non-placarded rail car, a railcar with a placard or marking shown in Group F on the Switching Chart or Group E on the Position-in-Train Chart, a residue/empty tank with no other restrictions, or a placarded rail car with no other restrictions.

**Bulk packaging** - packaging with capacity greater than 119 gallons (450 liters) for liquids, 882 pounds (400 kilograms) for solids, or a water capacity of greater than 1000 pounds (454 kilograms) for gases. For example, bulk bags, intermodal (IM) portable tanks, portable tanks, portable bins, gondola cars, hopper cars, or tank cars.

**Carrier** – a person (individual, corporation, company, etc.) who transports property in commerce by rail car, aircraft, motor vehicle, or vessel.

**Commodity name** – the proper shipping name or an authorized common name of a hazardous material.

**Container** – any freight container (box) or intermodal tank container (intermodal (IM) portable tank, portable tank, UN portable tank, or portable bin).

**Dangerous goods** – term used for “hazardous materials” in countries other than the United States.

**Division** – a subdivision of a hazard class; typically two numerals separated by a decimal point (2.1, 2.2, 2.3, 5.1, 5.2, etc.). For Class 1 (explosive materials), a “compatibility group letter” will be shown after the second numeral (1.1A, 1.4G, etc.).

**Documentation** – includes complete shipping documents with the appropriate shipping description entries and acceptable emergency response information.

**Elevated temperature material** – a material which, when offered for transportation or when transported as a bulk package, is:

- a liquid at a temperature at or above 212°F (100°C);
- a liquid with a flash point at or above 100°F (38°C) that is intentionally heated and offered for transportation or transported at or above its flash point; or,
- a solid at a temperature at or above 464°F (240°C).

Contact with an elevated temperature material may result in thermal burns, in addition to other hazards associated with the material.

**Emergency** – an unforeseen combination of circumstances or the resulting state that calls for immediate action (derailment and leaks).

**Emergency response information** - hazard and response information for each hazardous material, contained in the Emergency Response Guidebook (ERG) and other supplementary train documentation, to assist response personnel at hazardous material incidents.

**Emergency response telephone number** – the telephone number of an entity who is either knowledgeable of a hazardous material being shipped and has comprehensive emergency response and incident mitigation information for that material, or has immediate access to an entity who possesses such knowledge and information.

**Engine** – means a locomotive propelled by any form of energy and used by a railroad.

**Freight container** – a reusable container having a volume of 64 cubic feet or more, designed and constructed to permit being lifted with its contents intact and intended primarily for containment of packages (in unit form) during transportation.

**Fumigant** – a poisonous/toxic agent in vapor form intended to destroy insects and vermin.

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**Hazard class** - the category of hazard assigned to a material. A hazard class may be subdivided into divisions. When talking about hazard classes/divisions, the hazard class/division can be expressed as a number or with words (Class 3 (three) or Flammable Liquid; Division 2.1 (two-point-one) or Flammable Gas). A material will have a primary hazard class/division and may have one or more subsidiary hazard classes/divisions which represent additional hazards associated with the material.

**Hazardous material** - a substance or material which the Secretary of Transportation has determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term "hazardous material" includes hazardous substances, hazardous wastes, elevated temperature materials, and marine pollutants.

**Hazardous material shipment** - a hazardous material in rail cars, trailers, or containers in rail transportation. All hazardous material shipments require shipping documents. When moved in rail cars, trailers, or containers, hazardous material shipments may or may not be placarded or marked with an identification number.

**Hazardous substance** – a hazardous material that, as determined by the U.S. Environmental Protection Agency, has a detrimental effect on the environment. To be regulated in transportation, the quantity in one package must equal or exceed the material's "Reportable Quantity" ("RQ").

**Hazardous waste** – a material subject to the Hazardous Waste Manifest Requirements of the U.S. Environmental Protection Agency due to its potential threat to public health or the environment.

**Hazardous waste manifest** - a document specifically for tracking hazardous wastes in transportation. It contains the shipping description and identifies the waste generator, each transporter, and the designated (disposal) facility.

**Hazard zone** - one of four levels of inhalation hazard (Hazard Zones A through D) assigned to gases, and one of two levels of hazard (Hazard Zones A and B) assigned to liquids that are poisonous/toxic by inhalation. For example, when the hazard zone is "A," it is shown on the shipping document as "Zone A." Zone A is the most hazardous, and Zone D is the least hazardous.

**Identification number** – a 4-digit number preceded by "UN", "NA" or "ID" assigned to a hazardous material.

**Improvised Explosive Device (IED)** – is a device fabricated in an improvised manner incorporating explosives or destructive, lethal, noxious, pyrotechnic, or incendiary chemicals in its design. This device generally includes a power supply, a switch or timer, and a detonator or initiator.

**Inhalation Hazard** – term used to identify certain gases and liquids that may cause health problems if breathed in very low concentrations for short periods of time.

**Interchange** - the process of transferring rail cars to or from another railroad.

**Intermodal tank container** – an intermodal (IM) portable tank, portable tank, UN portable tank, or portable bin

**International shipment** – a shipment being made between two or more countries or between places in one country through another country.

**Limited quantity (LTD QTY)** – a term used to indicate a hazardous material shipment which is allowed an exception to certain regulatory requirements because of the small amount of the material in a package.

**Marine pollutant** – a hazardous material that has a detrimental effect on marine/aquatic life.

**Marking** – a descriptive commodity name, identification number, instructions, cautions (such as marine pollutant, inhalation hazard, elevated temperature material, limited quantities, fumigant, non-odorized, sour crude oil), weight, tank car specification and qualification dates stencils, or UN marks, or combinations thereof, required for display on hazardous material shipments.

**Movement Approval** – a one-time authorization to move a non-conforming package not meeting the applicable hazardous material regulations. This provides no relief of any regulations other than specifically stated in the approval.

**N.O.S.** - initials, found on shipping documents, which mean "Not Otherwise Specified."

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**Non-bulk packaging** - packaging with a capacity equal to or less than 119 gallons (450 liters) for liquids, 882 pounds (400 kilograms) for solids, or a water capacity of equal to or less than 1000 pounds (454 kilograms) for gases. For example, bags, bottles, boxes, cylinders, or drums.

**Package** – the packaging plus its contents. Packaging is the receptacle and any other components or materials necessary for the receptacle to perform its containment function.

**Packing group** - a grouping of hazardous materials according to the degree of danger:

- Packing Group I (shown as "PG I" or "I" on the shipping documents) indicates great danger.
- Packing Group II (shown as "PG II" or "II" on the shipping documents) indicates medium danger.
- Packing Group III (shown as "PG III" or "III" on the shipping documents) indicates minor danger.

**Placard** – a sign measuring at least 250 mm (9.8 in) by 250 mm (9.8 in) square-on-point, communicating a hazard by symbol, color, hazard class/division number and possibly text. Some placards must be displayed on a square background which is white with a black border.

**Placarded car** - a rail car displaying placards in accordance with DOT regulations.

**Poison Inhalation Hazard (PIH) or Toxic Inhalation Hazard (TIH)** - term used to identify certain gases and liquids that may cause health problems if breathed in very low concentrations for short periods of time.

**Position-in-Train document** – a document showing the current position of all hazardous material shipments within the train. This document could be the train list/consist or a separate document specifically for this purpose.

**Primary hazard** – see definition of “hazard class”.

**Proper shipping name** – the name of a hazardous material as specified by the regulations.

**Radio waybill** – a form used to record shipping description entries provided orally.

**Rail car** – equipment used in rail transportation. For example, box car, flat car, gondola car, hopper car, tank car, or caboose, but not an engine.

**Reportable quantity (RQ)** – the minimum quantity (in pounds or kilograms) in one package, required for a hazardous material to meet the definition of a “hazardous substance”.

**Residue** – the hazardous material remaining in a packaging, including a tank car, after its contents have been unloaded to the maximum extent possible. It may be indicated on the shipping documents by the phrase "RESIDUE: LAST CONTAINED . . ." in association with the basic description.

**Shipper's Certification** - a signed (or electronically printed) declaration on the shipping document provided by the shipper to the first transporter for a loaded hazardous material shipment. It indicates compliance with the DOT regulations. The certification must be signed by hand or mechanically. It may read either:

"This is to certify that the above-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation."

or

"I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations."

**Note:** A shipper's certification is required on any shipping document that the customer provides to the crew for loaded hazardous material cars.

**Shipping description entries** – the specific information required on a shipping document, including the “basic description”, number and type of packages, total quantity; and additional entries that may be applicable to the shipment (such as “RQ”, “Limited Quantity”/“LTD QTY”, “Marine Pollutant”, “Poison/Toxic Inhalation Hazard Zone A (or B, C or D)”, etc.).

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**Shipping document** – any document providing the required entries for a hazardous material shipment. This document can be in paper or electronic form. If in electronic form, the carrier must have authorization from DOT.

**Special Car Handling Instructions (SCHI) Code (*specific to BNSF operations*)** – A two-letter code used to identify the primary placard required for a hazardous material shipment.

**Special Permit** – A document issued by the Department of Transportation (DOT) permitting a person to perform a function that is not otherwise permitted under the DOT's regulations.

**Subsidiary hazard** – see definition of “hazard class”.

**Subsidiary placard** – a placard that identifies a specific material's subsidiary hazard(s).

**Switching** - the operation of moving rail cars within a yard, at a customer's facility, or at an interchange point, in order to place them in a train or on a classification, repair, or storage track. It does **not** include moving rail cars to or from a shipper's facility or industry track into or out of the yard.

**Technical name** - a recognized chemical name or microbiological name used in scientific and technical handbooks, journals, and texts to further identify a hazardous material.

**Total quantity notation** – the total weight or volume, including the unit of measurement, of the hazardous material contained in a package, such as “100 LBS”, “55 GAL”, “5 KG”, or “208 L”. For bulk packages and cylinders, merely an indication of the total quantity is required, such as “1 IM Tank” or “2 IBCs”; or, “10 cylinders” or “10 cyl.” For non-bulk packages, number and type of packages are also required, such as “12 DRUMS (UN 1A1)” or “15 BOXES”. An indication of total quantity is not required for packages containing only residue.

**Toxic Inhalation Hazard (TIH) or Poison Inhalation Hazard (PIH)** - term used to identify certain gases and liquids that may cause health problems if breathed in very low concentrations for short periods of time.

**Trailer** – a cargo carrying body with permanent wheels on the rear end (also called a van or semitrailer).

**Train** - one or more engines coupled, with or without rail cars, displaying a marker, and requiring an appropriate air brake test.

**Yard** - a system of tracks, other than main tracks and sidings, used for making and breaking up trains and for other purposes, such as repair or storage of cars.