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Module 6.0c: Carrier Requirements – Rail

Introduction

Carrier Requirements: Rail
This module is based on Part 174 and presents the DOT requirements for transporting hazardous materials by rail. The discussion will center on general operating requirements, handling and loading requirements, segregation of hazardous materials, and the positioning of placarded cars in the train.

Objectives
1. Compare the general operating requirements for DOT and the general railroad industry along with the exceptions for the transportation of hazardous materials by rail.
2. Describe the information found in the Segregation Table for Hazardous Materials for rail transport.
3. Identify the documentation needed for rail cars within a train containing hazardous materials.
4. Illustrate the proper positioning of placarded cars in a train using the Placard Group Table.
5. Discuss rail industry restrictions as they relate to the transportation of hazardous materials, to include speeds, routes, and inspections.
6. Identify incident/accident reporting requirements.

DOT vs. Railroad Regulations

Part 174: Carrier by Rail Requirements
You may not accept hazardous materials for transportation unless they are properly classed, described on a shipping paper, packaged, marked, and labeled according to the requirements of the HMR. Hazardous materials shipments by rail must comply with the requirements of Part 174 as well as those contained in Parts 171, 172, 173 and 179 of the HMR. Without the required shipping papers, you must not accept a car containing hazardous materials for transportation by rail.

Exceptions for Railroads Transporting Its Own Hazardous Materials
A railroad transporting its own supplies of hazardous materials must meet all the other requirements of the HMT, although a shipper’s certification is not required on the shipping paper when a railroad is transporting its own supplies.

The requirements of the HMR do not apply to railway torpedoes and fuses when carried in engines or rail cars. Torpedoes must be in a closed, metal box when not in use.
**Inspection**

A rail carrier must inspect each rail car containing hazardous materials, at ground level, for required markings, labels, placards, securement of closures, and leakage, at each location where a hazardous material is accepted or placed in a train.

The carrier must also visually inspect the rail car at ground level for signs of tampering, including closures and seals, for suspicious items or items that do not belong. In addition, inspect for other signs that the security of the car may have been compromised, including the presence of an improvised explosive device.

If a rail car does not conform to these safety and security requirements, the carrier may not forward or transport the rail car until the deficiencies are corrected or the car is approved for movement in accordance with section 174.50.

**Disposition of Materials**

A carrier must forward shipment of hazardous materials promptly and within 48 hours after acceptance (not counting Saturdays, Sundays, and holidays). Carriers that provide only weekly or biweekly service must forward hazardous material shipments on the first available train. Division 2.1 (flammable gas), Division 2.3 (poisonous gas), or Class 3 (flammable liquid) loaded in a tank car may not be received and held at any point, subject to the forwarding orders.

**Imposition of Additional Restrictions**

A rail carrier may impose additional restrictions on a hazmat shipment when local conditions make acceptance, transportation, or delivery unusually hazardous. The carrier must report additional local restrictions to the Bureau of Explosives for publication.

**Bulk Packaging**

You may transport a bulk packaging containing a hazardous material inside a fully closed transport vehicle or freight container, if it is properly secured with a restraint system so it will not change position, slide into other packages or contact the walls of the transport vehicle or freight container during normal transportation conditions. Bulk packaging not in conformance with and subject to these requirements may be transported in container-on-flat-car trailer-on flat-car service subject to the conditions in section 174.63(c)(1-6), or be approved by the Associate Administrator for Safety in the Federal Railroad Administration (FRA).

**Note:** Review section 174.63(c)(1-6) to become more familiar with those bulk packaging requirements.
Movement of Hazmat with Approval of the Federal Railroad Administration

You may not transport a cargo tank or multi-unit tank car tank containing a hazardous material in trailer-on-flat-car or container-on-flat-car unless this service is approved by the Associate Administrator for Safety in the Federal Railroad Administration (FRA) -car service. In the event of an accident or incident, no such approval is necessary for the movement of the cargo tank provided:

- There is an emergency need for the cargo tank in order to mitigate the consequences of an incident.
- Movement of the cargo tank is limited to transportation for emergency purposes.

Segregation

Hazardous Materials Segregation Table

You must segregate hazardous materials in loading, transportation, and storage according to the Segregation Table for Hazardous Materials in section 174.81(d). To use the table, match the hazard classes in the left-hand column with hazard classes across the top row. This table uses different symbols to provide information.
As we have learned, some materials have primary and subsidiary hazards. When a subsidiary hazard label is required, you must apply the segregation appropriate to the subsidiary hazard when it is more restrictive than the segregation for the primary hazard.

However, hazardous materials in the same hazard class may be stowed together without regard to segregation required by the subsidiary hazard if the materials cannot react dangerously with each other.
**Unloading Hazardous Materials**
When carrier personnel unload a tank car, unloading must be performed by a reliable person who has been trained and is responsible for unloading safely.

- The brakes must be set and at least one wheel blocked on at least one car being unloaded. If multiple cars are being unloaded, sufficient hand brakes must be set and wheels blocked to prevent movement in both directions.
- Caution signs, to warn approaching people, must be placed on the track or on the car.
- Pressure must be relieved before opening manhole covers or outlet valve caps. Safety procedures must be followed when breaking seals, opening manhole covers, and performing unloading operations.
- Unloading connections for tank cars must be securely attached to unloading pipes.
- A tank car must be attended by a designated hazmat employee.

**Loading of Hazardous Materials**

- If you load packages in a freight container or transport vehicle, you must load each package containing a hazardous material so that it cannot fall or slide.
- You must also protect hazardous materials packages so that other freight cannot fall onto or slide into them.
- If other freight cannot protect the packages, blocking and bracing must be used.
- For blocking and bracing examples, see the Bureau of Explosives Pamphlet No. 6 and the Intermodal Loading Guide for Products in Closed Trailers and Containers. See section 174.55(a).
- If a hazardous materials package bears orientation markings you must load it so that the markings are pointing in an upright position.
- You must not use the doors of a freight container or transport vehicle to secure a load containing a hazardous materials package, unless the doors meet the design strength specification for freight containers and trailer. The specifications are M-930 for freight containers and M-931 for trailers in the Association of American Railroads (AAR) Manual of Standards and Recommended Practices.

**Loading Class 1 (Explosive) Materials**
You must load Class 1 (Explosive) materials for rail transportation according to detailed requirements in Subpart E of Part 174, as applicable. The requirements address procedure for properly loading and securing Class 1 explosives in order to ensure safe rail transportation.

**DOT Restrictions**

**Train Placement Restrictions Section 174.85**
Reading down the left side of the table, there are six placement restrictions. The four placard groups read left to right across the top of the table. The table is arranged to show an X under the type of placarded car where each restriction applies.
Restrictions #1 and #2
Restriction #1 states, “When train length permits, the placarded car may not be nearer than the sixth car from the engine or occupied caboose.”

Restriction #2 states, “When the train length does not permit, the placarded car must be placed near the middle of the train, but not nearer than the second car from an engine or occupied caboose.”

Restrictions #1 and #2 apply to Placard Group 1 rail cars, and to tank cars in Placard Groups 2 and 3.

Restriction #3
Restriction #3 states that a placarded car may not be placed next to an open-top car when any of the lading in the open top car protrudes beyond the car ends or would protrude if the lading shifted.

Restriction #3 applies to Placard Group 1 rail cars and Placard Groups 2 and 3 tanks cars.

Restriction #4
Restriction #4 states that a placarded car may not be placed next to a loaded flatcar that does not have permanent bulkheads.

This restriction does not apply if the flatcar is loaded with closed container on flatcar or trailer on flatcar equipment, or if the flatcar is an auto carrier or has other equipment with tie-down devices for securing vehicles. Restriction #4 applies to Placard Group I rail cars and Placard Groups 2 and 3 tank cars.

| POSITION IN TRAIN OF PLACARDED CARS TRANSPORTING HAZARDOUS MATERIALS |
|------------------------|----------------|----------------|----------------|----------------|
|                        | Placard Group 1 | Placard Group 2 | Placard Group 3 | Placard Group 4 |
|                        | Rail Car | Tank Car | Rail Car | Tank Car | Rail Car | Rail Car |
| 1. When train length permits, placarded car may not be nearer than the sixth car from the engine or occupied caboose | X | X | X | X |
| 2. When train length does not permit, placarded car must be placed near the middle of the train, but not nearer than the second car from an engine or occupied caboose | X | X | X | X |
| 3. A placarded car may not be placed next to an open-top car when any of the lading in the open top car protrudes beyond the car ends, or if the lading shifted, would protrude beyond the car ends | X | X | X | X |
| 4. A placarded car may not be placed next to a loaded flatcar, except closed TOFC/COFC equipment, auto carriers, and other specially equipped cars with tie-down devices for securing vehicles. Permanent bulk head flat cars are considered the same as open-top cars | X | X | X | X |
| 5. A placarded car may not be placed next to any transport vehicle or freight container having an internal combustion engine or an open-flame device in operation | X | X | X | X |
| 6. Placarded cars may not be placed next to each other based on the following: Placard Group 1 | X | X | X | X | X |
| Placard Group 2 | X | X | X | X | X |
| Placard Group 3 | X | X | X | X | X |
| Placard Group 4 | X | X | X | X | X |
Restriction #5
Restriction #5 states that a placarded car may not be placed next to any transport vehicle or freight container having an internal combustion engine or an open flame device in operation. Restriction #5 applies to Placard Group 1 rail cars, and Placard Groups 2 and 3 tank cars.

Restriction #6
Restriction #6 explains which placarded cars may NOT go next to each other. The table (on the previous page) shows that for each Placard Group the restriction applies to every other Placard Group. In other words, cars from the same Placard Group may be placed next to each other and cars from different Placard Groups may not.

Activity: Matching
Draw a line from the restriction number identified in the left column to the restriction description in the right column.

<table>
<thead>
<tr>
<th>Restriction Number</th>
<th>Restriction Description</th>
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<tbody>
<tr>
<td>Restriction #1</td>
<td>Placard Group 3 commodity in a rail car may not be placed next to an open-top car if the lading has the potential to protrude.</td>
</tr>
<tr>
<td>Restriction #2</td>
<td>Placard Group 2 commodity in a tank car may not be placed next to any transport vehicle or freight container with an internal combustion engine</td>
</tr>
<tr>
<td>Restriction #3</td>
<td>Placard Group 3 commodity in a tank car may not be placed next to a loaded flat car.</td>
</tr>
<tr>
<td>Restriction #4</td>
<td>Cars with different placarding group may not be placed next to each other.</td>
</tr>
<tr>
<td>Restriction #5</td>
<td>Placard Group 2 commodity in a tank car may not be nearer than the sixth car.</td>
</tr>
<tr>
<td>Restriction #6</td>
<td>Placard Group 3 must be placed near the middle of the train, but not nearer than the second car from an engine or occupied caboose.</td>
</tr>
</tbody>
</table>
**Restrictions**

**Radioactive Material**
There are additional placement restrictions not covered in the Table. A car placarded RADIOACTIVE must be separated by at least one non-placarded car from a locomotive, an occupied caboose, or a carload of undeveloped film.

**Escorted Cars**
Escorted cars must be placed next to or ahead of the car occupied by the guards or technical escorts if they are placarded:

- Division 1.1 or 1.2 (explosives)
- Division 2.3 (Hazard Zone A, poison gas)
- Division 6.1 (PG I, Hazard Zone A, poisonous liquid)

If a car occupied by guards or technical escorts has an operating heater or air conditioning equipment, it must be the fourth car behind a car requiring Division 1.1 or 1.2 placards.

**Maximum Speed**
The maximum speed of cars carrying molten metal or molten glass may not exceed 15 miles per hour if the packaging does not meet the requirements in section 173.247. The maximum speed of any placarded rail car carrying a material that is poisonous by inhalation may not exceed 50 miles per hour.

**Documentation/Placarding**

**HMR “Train” Definition**
Requirements for carrying shipping papers and other hazmat-related documents depend on when car movement takes place in a “train.” The HMR defines a train as:

- “One or more engines coupled with one or more rail cars, except during switching operations or where the operation is that of classifying and assembling rail cars within a railroad yard for the purpose of making or breaking up trains.”
- The FRA has clarified this definition, saying a “train” exists when federal air brake rules apply to train movement or when picking up or setting out cars at interchanges or industry.
**Documentation**

A train crew must carry a document showing the current position of each rail car containing a hazardous material in the train. This document is called a train consist. The train crew must also update the train consist if changes are made to the position of a hazmat rail car within a train.

A crew member must also have a copy of the document showing the information required by Part 172 of the HMR, including emergency response information.

**Markings and Placards**

You may not use a rail car to transport hazardous materials unless it displays the required markings and placards. Placards and car certificates lost in transit must be replaced at the next inspection point. Those not required must be removed at the next terminal where the train is classified.

If the carrier is not aware of a placarding irregularity until the time of inspection, the “next inspection point” means the inspection point at which the placarding irregularity is noticed. That is, the carrier does not have the option of waiting until the inspection point after the one where the irregularity becomes known.

**Switching Operations**

Switching placarded railcars requires certain considerations when the use of hand brakes is necessary. Hand brakes must be tested to make sure they are working properly before cutting off cars during switching operations. Cars with switching restrictions must clear the ladder track before other cars can be cut off in motion.

**Handling Restrictions - General**

Strict handling restrictions apply to any rail car that is placarded:

- Division 1.1 Explosives
- Division 1.2 Explosives
- Division 2.3, Zone A, Poisonous Gases
- DOT 113 tank cars placarded Division 2.1 Flammable Gas
- Division 6.1, Packing Group I

**Handling Restrictions**

No rail car moving under its own momentum may strike any placarded flatcar or any flatcar carrying a placarded transport vehicle, freight container, or bulk packaging. A placarded flatcar or a flatcar carrying a transport vehicle, freight container, or bulk packaging may not be cut off while in motion, or be coupled into with more force than is necessary to complete the coupling. Most carrier operating rules specify a coupling speed of no more than 4 mph, but this is not a Federal regulatory requirement.

**Placard Group Table**

The table organizes placards into groups based on hazard classification.

- Placard Groups 1 and 4 apply to rail cars only
- Placard Groups 2 and 3 are subdivided into rail cars and tank cars because both types of cars may be used to carry the hazardous materials in these groups
Placard Group 1
Placard Group 1 applies to rail cars only and includes Division 1.1 and 1.2 (Explosives).

- Cars placarded Division 1.1 or 1.2 explosives face additional restrictions while being handled in a terminal, yard, or siding.
- They must be separated from the engine by at least one non-placarded car, and they must be placed in a location that is safe from danger of fire.
- The cars may not be placed under a bridge or overhead crossing, nor near a passenger shed or station except during transfer operations.

Placard Group 2
Placard Group 2 is subdivided into rail cars and tank cars, because both types of cars may be used to carry the hazardous materials in these groups, and includes:

- Division 1.3, 1.4, 1.5
- Class 2 (not including Division 2.3, PG I, Zone A)
- Class 3
- Class 4
- Class 5
- Class 6 (not Division 6.1, PG I, Zone A)
- Class 8

Placard Group 3
Placard Group 3 is subdivided into rail cars and tank cars, because both types of cars may be used to carry the hazardous materials in these groups, and includes:

- Division 2.3 (PG I, Zone A; poisonous gas)
- Division 6.1 (PG I, Zone A; poisonous liquid)

Placard Group 4
Placard Group 4 applies to rail cars only carrying Class 7 (Radioactive) materials.

Restrictions/Incident Reporting

Incident/Accident Reporting
Incidents or accidents involving hazardous materials require notification to the National Response Center (NRC) within 12 hours when:

- A person is killed, or requires hospitalization for injury
- An evacuation lasting more than one hour occurs
- One or more major transportation route is closed for more than one hour
- Aircraft flight patterns are altered

Immediate notification is also required for incidents involving:

- Radioactive contamination
- More than 450 liters of liquid marine pollutants or 400 kilograms of solid marine pollutants
A written report is also required within 30 days when any of the above criteria are met, or when any of the criteria of section 171.16 are met.

For Class 7 (radioactive) incidents, you must notify the offeror of the shipment at the earliest practicable moment.

Summary

You have completed all the materials for Module 6c. You should be able to:

- Compare the general operating requirements for DOT and the general railroad industry along with the exceptions for the transportation of hazardous materials by rail.
- Use the Segregation Table for Hazardous Materials for rail transport.
- Identify the documentation needed for rail cars within a train containing hazardous materials.
- Illustrate the proper positioning of placarded cars in a train using the Placard Group Table.
- Discuss rail industry restrictions as they relate to the transportation of hazardous materials, to include speeds, routes, and inspections.
- Identify incident/accident reporting requirements.

References