AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

where the material is relinquished to another entity. Railroad facilities are railroad property including, but not limited to, classification and switching yards, storage facilities, and non-private sidings; however, they do not include an offeror's facility, private track, private siding, or consignee's facility. Each rail carrier must use best efforts to communicate with its shippers, consignees, and interlining partners to ensure the safety and security of shipments during all stages of transportation.

C. Because of the varying operating environments and interconnected nature of the rail system, each carrier must select and document the analysis method/model used and identify the routes to be analyzed.

D. The safety and security risk analysis must consider current data and information as well as changes that may reasonably be anticipated to occur during the analysis year. Factors to be considered in the performance of this safety and security risk analysis include:

1. Volume of hazardous material transported;
2. Rail traffic density;
3. Trip length for route;
4. Presence and characteristics of railroad facilities;
5. Track type, class, and maintenance schedule;
6. Track grade and curvature;
7. Presence or absence of signals and train control systems along the route (''dark'' versus signaled territory);
8. Presence or absence of wayside hazard detectors;
9. Number and types of grade crossings;
10. Single versus double track territory;
11. Frequency and location of track turnouts;
12. Proximity to iconic targets;
13. Environmentally sensitive or significant areas;
14. Population density along the route;
15. Venues along the route (stations, events, places of congregation);
16. Emergency response capability along the route;
17. Areas of high consequence along the route, including high consequence targets as defined in §172.820(c);
18. Presence of passenger traffic along route (shared track);
19. Speed of train operations;
20. Proximity to en-route storage or repair facilities;
21. Known threats, including any non-public threat scenarios provided by the Department of Homeland Security or the Department of Transportation for carrier use in the development of the route assessment;
22. Measures in place to address apparent safety and security risks;
23. Availability of practicable alternative routes;
24. Past incidents;
25. Overall times in transit;
26. Training and skill level of crews; and
27. Impact on rail network traffic and congestion.

[73 FR 20772, April 16, 2008]

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

Subpart A—General

Sec.

173.1 Purpose and scope.
173.2 Hazardous materials classes and index to hazard class definitions.
173.2a Classification of a material having more than one hazard.
173.3 Packaging and exceptions.
173.4 Small quantity exceptions.
173.4a Excepted quantities.
173.5 Agricultural operations.
173.5a Oilfield service vehicles, mechanical displacement meter provers, and roadway striping vehicles exceptions.
173.5b Portable and mobile refrigeration systems.
173.6 Materials of trade exceptions.
173.7 Government operations and materials.
173.8 Exceptions for non-specification packagings used in intrastate transportation.
173.9 Transport vehicles or freight containers containing lading which has been fumigated.
173.10 Tank car shipments.
173.12 Exceptions for shipment of waste materials.
173.13 Exceptions for Class 3, Divisions 4.1, 4.2, 4.3, 5.1, 6.1, and Classes 8 and 9 materials.

Subpart B—Preparation of Hazardous Materials for Transportation

173.21 Forbidden materials and packages.
173.22 Shipper's responsibility.
173.22a Use of packagings authorized under special permits.
173.23 Previously authorized packaging.
173.24 General requirements for packagings and packages.
173.24a Additional general requirements for non-bulk packagings and packages.
173.24b Additional general requirements for bulk packagings.
173.25 Authorized packagings and overpacks.
173.26 Quantity limitations.
173.27 General requirements for transportation by aircraft.
173.28 Reuse, reconditioning and remanufacture of packagings.
173.29 Empty packagings.
173.30 Loading and unloading of transport vehicles.

173.31 Use of tank cars.
173.32 Requirements for the use of portable tanks.
173.33 Hazardous materials in cargo tank motor vehicles.
173.34 [Reserved]
173.35 Hazardous materials in intermediate bulk containers (IBCs).
173.36 Hazardous materials in Large Packagings.
173.40 General packaging requirements for toxic materials packaged in cylinders.

Subpart C—Definitions, Classification and Packaging for Class 1

173.50 Class 1—Definitions.
173.51 Authorization to offer and transport explosives.
173.52 Classification codes and compatibility groups of explosives.
173.53 Provisions for using old classifications of explosives.
173.54 Forbidden explosives.
173.55 [Reserved]
173.56 New explosives—Definition and procedures for classification and approval.
173.57 Acceptance criteria for new explosives.
173.58 Assignment of class and division for new explosives.
173.59 Description of terms for explosives.
173.60 General packaging requirements for explosives.
173.61 Mixed packaging requirements.
173.62 Specific packaging requirements for explosives.
173.63 Packaging exceptions.

Subpart D—Definitions, Classification, Packing Group Assignments and Exceptions for Hazardous Material Other Than Class 1 and Class 7

173.115 Class 2, Divisions 2.1, 2.2, and 2.3—Definitions.
173.116 Class 2—Assignment of hazard zone.
173.117–173.119 [Reserved]
173.120 Class 3—Definitions.
173.121 Class 3—Assignment of packing group.
173.124 Class 4, Divisions 4.1, 4.2 and 4.3—Definitions.
173.125 Class 4—Assignment of packing group.
173.127 Class 5, Division 5.1—Definition and assignment of packing groups.
173.128 Class 5, Division 5.2—Definitions and types.
173.129 Class 5, Division 5.2—Assignment of packing group.
173.132 Class 6, Division 6.1—Definitions.
173.133 Assignment of packing group and hazard zones for Division 6.1 materials.
173.134 Class 6, Division 6.2—Definitions and exceptions.
173.136 Class 8—Definitions.
173.137 Class 8—Assignment of packing group.
173.140 Class 9—Definitions.
173.141 Class 9—Assignment of packing group.
173.144 Other Regulated Materials (ORM)—Definitions.
173.145 Other Regulated Materials—Assignment of packing group.
173.150 Exceptions for Class 3 (flammable and combustible liquids).
173.151 Exceptions for Class 4.
173.152 Exceptions for Division 5.1 (oxidizers) and Division 5.2 (organic peroxides).
173.153 Exceptions for Division 6.1 (poisonous materials).
173.154 Exceptions for Class 8 (corrosive materials).
173.155 Exceptions for Class 9 (miscellaneous hazardous materials).
173.156 Exceptions for limited quantity and ORM.

Subpart E—Non-bulk Packaging for Hazardous Materials Other Than Class 1 and Class 7

173.158 Nitric acid.
173.159 Batteries, wet.
173.159a Exceptions for non-spillable batteries.
173.160 Bombs, smoke, non-explosive (corrosive).
173.161 Chemical kits and first aid kits.
173.162 Gallium.
173.163 Hydrogen fluoride.
173.164 Mercury (metallic and articles containing mercury).
173.165 Polyester resin kits.
173.166 Air bag inflators, air bag modules and seat-belt pretensioners.
173.167 Consumer commodities.
173.168 Chemical oxygen generators.
173.170 Black powder for small arms.
173.171 Smokeless powder for small arms.
173.172 Aircraft hydraulic power unit fuel tank.
173.173 Paint, paint-related material, adhesives and ink and resins.
173.174 Refrigerating machines.
173.175 Permeation devices.
173.181 Pyrophoric materials (liquids).
173.182 Barium azide—50 percent or more water wet.
173.183 Nitrocellulose base film.
173.184 Highway or rail fusee.
173.185 Lithium batteries and cells.
173.186 Matches.
173.187 Pyrophoric solids, metals or alloys, n.o.s.
173.188 White or yellow phosphorous.
173.189 Batteries containing sodium or cells containing sodium.
173.192 Packaging for certain toxic gases in Hazard Zone A.

173.193 Bromoacetone, methyl bromide, chloropicrin and methyl bromide or methyl chloride mixtures, etc.
173.194 Gas identification sets.
173.195 Hydrogen cyanide, anhydrous, stabilized (hydrocyanic acid, aqueous solution).
173.196 Category A infectious substances.
173.197 Regulated medical waste.
173.198 Nickel carbonyl.
173.199 Category B infectious substances.
173.201 Non-bulk packagings for liquid hazardous materials in Packing Group I.
173.202 Non-bulk packagings for liquid hazardous materials in Packing Group II.
173.203 Non-bulk packagings for liquid hazardous materials in Packing Group III.
173.204 Non-bulk, non-specification packagings for certain hazardous materials.
173.205 Specification cylinders for liquid hazardous materials.
173.206 Packaging requirements for chlorosilanes.
173.211 Non-bulk packagings for solid hazardous materials in Packing Group I.
173.212 Non-bulk packagings for solid hazardous materials in Packing Group II.
173.213 Non-bulk packagings for solid hazardous materials in Packing Group III.
173.214 Packagings which require approval by the Associate Administrator.
173.216 Asbestos, blue, brown, or white.
173.217 Carbon dioxide, solid (dry ice).
173.218 Fish meal or fish scrap.
173.219 Life-saving appliances.
173.220 Internal combustion engines, self-propelled vehicles, mechanical equipment containing internal combustion engines, battery-powered equipment or machinery, fuel cell-powered equipment or machinery.
173.221 Polymeric beads, expandable and Plastic molding compound.
173.222 Dangerous good in machinery or apparatus.
173.223 Packagings for certain flammable solids.
173.224 Packaging and control and emergency temperatures for self-reactive materials.
173.225 Packaging requirements and other provisions for organic peroxides.
173.226 Materials poisonous by inhalation, Division 6.1, Packing Group I, Hazard Zone A.
173.227 Materials poisonous by inhalation, Division 6.1, Packing Group I, Hazard Zone B.
173.228 Bromine pentafluoride or bromine trifluoride.
173.229 Chloric acid solution or chlorine dioxide hydrate, frozen.
173.230 Fuel cell cartridges containing hazardous material.

Subpart F—Bulk Packaging for Hazardous Materials Other Than Class 1 and Class 7

173.240 Bulk packaging for certain low hazard solid materials.
173.241 Bulk packagings for certain low hazard liquid and solid materials.
173.242 Bulk packagings for certain medium hazard liquids and solids, including solids with dual hazards.
173.243 Bulk packaging for certain high hazard liquids and dual hazard materials which pose a moderate hazard.
173.244 Bulk packaging for certain pyrophoric liquids (Division 4.2), dangerous when wet (Division 4.3) materials, and poisonous liquids with inhalation hazards (Division 6.1).
173.245 Bulk packaging for extremely hazardous materials such as poisonous gases (Division 2.3).
173.247 Bulk packaging for certain elevated temperature materials.
173.249 Bromine.

Subpart G—Gases; Preparation and Packaging

173.300 [Reserved]
173.301 General requirements for shipment of compressed gases and other hazardous materials in cylinders, UN pressure receptacles and spherical pressure vessels.
173.301a Additional general requirements for shipment of specification cylinders.
173.301b Additional general requirements for shipment of UN pressure receptacles.
173.302 Filling of cylinders with nonliquefied (permanent) compressed gases.
173.302a Additional requirements for shipment nonliquefied (permanent) compressed gases in specification cylinders.
173.302b Additional requirements for shipment of non-liquefied (permanent) compressed gases in UN pressure receptacles.
173.303 Charging of cylinders with compressed gas in solution (acetylene).
173.304 Filling of cylinders with liquefied compressed gases.
173.304a Additional requirements for shipment of liquefied compressed gases in specification cylinders.
173.304b Additional requirements for shipment of liquefied compressed gases in UN pressure receptacles.
173.305 Charging of cylinders with a mixture of compressed gas and other material.
173.306 Limited quantities of compressed gases.
173.307 Exceptions for compressed gases.
173.308 Cigarette lighter or other similar device charged with fuel.
173.309 Fire extinguishers.
173.310 Exceptions for radiation detectors.
173.311 Metal hydride storage systems.
173.312 Requirements for shipment of MEGCs.

173.313 UN Portable Tank Table for Liquefied Compressed Gases.
173.314 Compressed gases in tank cars and multi-unit tank cars.
173.315 Compressed gases in cargo tanks and portable tanks.
173.316 Cryogenic liquids in cylinders.
173.318 Cryogenic liquids in cargo tanks.
173.319 Cryogenic liquids in tank cars.
173.320 Cryogenic liquids; exceptions.
173.321 Ethylamine.
173.322 Ethyl chloride.
173.323 Ethylene oxide.
173.334 Organic phosphates mixed with compressed gas.
173.335 [Reserved]
173.336 Nitrogen dioxide, liquefied, or dinitrogen tetroxide, liquefied.
173.337 Nitric oxide.
173.338 Tungsten hexafluoride.
173.340 Tear gas devices.

Subpart H [Reserved]

Subpart I—Class 7 (Radioactive) Materials

173.401 Scope.
173.403 Definitions.
173.410 General design requirements.
173.411 Industrial packagings.
173.412 Additional design requirements for Type A packages.
173.413 Requirements for Type B packages.
173.415 Authorized Type A packages.
173.416 Authorized Type B packages.
173.417 Authorized fissile materials packages.
173.418 Authorized packages—pyrophoric Class 7 (radioactive) materials.
173.419 Authorized packages—oxidizing Class 7 (radioactive) materials.
173.420 Uranium hexafluoride (fissile, fissile excepted and non-fissile).
173.421 Excepted packages for limited quantities of Class 7 (radioactive) materials.
173.422 Additional requirements for excepted packages containing Class 7 (radioactive) materials.
173.423 Requirements for multiple hazard limited quantity Class 7 (radioactive) materials.
173.424 Excepted packages for radioactive instruments and articles.
173.425 Table of activity limits—excepted quantities and articles.
173.426 Excepted packages for articles containing natural uranium or thorium.
173.427 Transport requirements for low specific activity (LSA) Class 7 (radioactive) materials and surface contaminated objects (SCO).
173.428 Empty Class 7 (radioactive) materials packaging.
173.431 Activity limits for Type A and Type B packages.
173.433 Requirements for determining basic radionuclide values, and for the listing of radionuclides on shipping papers and labels.
173.434 Activity-mass relationships for uranium and natural thorium.
173.435 Table of A_1 and A_2 values for radionuclides.
173.436 Exempt material activity concentrations and exempt consignment activity limits for radionuclides.
173.441 Radiation level limitations and exclusive use provisions.
173.442 Thermal limitations.
173.443 Contamination control.
173.447 Storage incident to transportation—general requirements.
173.448 General transportation requirements.
173.453 Fissile materials—exceptions.
173.457 Transportation of fissile material packages—specific requirements.
173.459 Mixing of fissile material packages with non-fissile or fissile-excepted material packages.
173.461 Demonstration of compliance with tests.
173.462 Preparation of specimens for testing.
173.465 Type A packaging tests.
173.466 Additional tests for Type A packagings designed for liquids and gases.
173.467 Tests for demonstrating the ability of Type B and fissile materials packagings to withstand accident conditions in transportation.
173.468 Test for LSA-III material.
173.469 Tests for special form Class 7 (radioactive) materials.
173.471 Requirements for U.S. Nuclear Regulatory Commission approved packages.
173.472 Requirements for exporting DOT Specification Type B and fissile packages.
173.473 Requirements for foreign-made packages.
173.474 Quality control for construction of packaging.
173.475 Quality control requirements prior to each shipment of Class 7 (radioactive) materials.
173.476 Approval of special form Class 7 (radioactive) materials.
173.477 Approval of packagings containing greater than 0.1 kg of non-fissile or fissile-excepted uranium hexafluoride.

Subparts J–O [Reserved]

APPENDIX A TO PART 173 [RESERVED]
APPENDIX B TO PART 173—PROCEDURE FOR TESTING CHEMICAL COMPATIBILITY AND RATE OF PERMEATION IN PLASTIC PACKAGING AND RECEPTACLES
APPENDIX C TO PART 173—PROCEDURE FOR BASE-LEVEL VIBRATION TESTING
APPENDIX D TO PART 173—TEST METHODS FOR DYNAMITE (EXPLOSIVE, BLASTING, TYPE A)
APPENDIXES E–G TO PART 173 [RESERVED]

APPENDIX H TO PART 173—METHOD OF TESTING FOR SUSTAINED COMBUSTIBILITY

AUTHORITY: 49 U.S.C. 5101–5128, 44701; 49 CFR 1.45, 1.53.

EDITORIAL NOTE: Nomenclature changes to part 173 appear at 70 FR 56098, Sept. 23, 2005.

Subpart A—General

§ 173.1 Purpose and scope.

(a) This part includes:

(1) Definitions of hazardous materials for transportation purposes;

(2) Requirements to be observed in preparing hazardous materials for shipment by air, highway, rail, or water, or any combination thereof; and

(3) Inspection, testing, and retesting responsibilities for persons who retest, recondition, maintain, repair and rebuild containers used or intended for use in the transportation of hazardous materials.

(b) A shipment of hazardous materials that is not prepared in accordance with this subchapter may not be offered for transportation by air, highway, rail, or water. It is the responsibility of each hazmat employer subject to the requirements of this subchapter to ensure that each hazmat employee is trained in accordance with the requirements prescribed in this subchapter. It is the duty of each person who offers hazardous materials for transportation to instruct each of his officers, agents, and employees having any responsibility for preparing hazardous materials for shipment as to applicable regulations in this subchapter.

(c) In general, the Hazardous Materials Regulations (HMR) contained in this subchapter are based on the UN Recommendations and are consistent with international regulations issued by the International Civil Aviation Organization (ICAO Technical Instructions) and the International Maritime Organization (IMDG Code). However, the HMR are not consistent in all respects with the UN Recommendations, the ICAO Technical Instructions or the IMDG Code, and compliance with the HMR will not guarantee acceptance by regulatory bodies outside of the United States.

[Amdt. 173–94, 41 FR 16062, Apr. 15, 1976, as amended by Amdt. 173–100, 41 FR 40476, Sept. 20, 1976; Amdt. 173–161, 48 FR 2655, Jan. 20, 1983; Amdt. 173–224, 55 FR 52606, Dec. 21, 1990; Amdt. 173–231, 57 FR 20953, May 15, 1992; 64 FR 10776, Mar. 5, 1999; 68 FR 61941, Oct. 30, 2003]

§ 173.2 Hazardous materials classes and index to hazard class definitions.

The hazard class of a hazardous material is indicated either by its class (or division) number, its class name, or by the letters ''ORM-D''. The following table lists class numbers, division numbers, class or division names and those sections of this subchapter which contain definitions for classifying hazardous materials, including forbidden materials.

Class No.	Division No. (if any)	Name of class or division	49 CFR reference for definitions
None		Forbidden materials	173.21
None		Forbidden explosives	173.54
1	1.1	Explosives (with a mass explosion hazard)	173.50
1	1.2	Explosives (with a projection hazard)	173.50
1	1.3	Explosives (with predominately a fire hazard)	173.50
1	1.4	Explosives (with no significant blast hazard)	173.50
1	1.5	Very insensitive explosives; blasting agents	173.50
1	1.6	Extremely insensitive detonating substances	173.50
2	2.1	Flammable gas	173.115
2	2.2	Non-flammable compressed gas	173.115
2	2.3	Poisonous gas	173.115
3		Flammable and combustible liquid	173.120
4	4.1	Flammable solid	173.124
4	4.2	Spontaneously combustible material	173.124
4	4.3	Dangerous when wet material	173.124
5	5.1	Oxidizer	173.127
5	5.2	Organic peroxide	173.128
6	6.1	Poisonous materials	173.132
6	6.2	Infectious substance (Etiologic agent)	173.134
7		Radioactive material	173.403
8		Corrosive material	173.136
9		Miscellaneous hazardous material	173.140