DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

49 CFR Parts 107, 171, 172, 173, 178, and 180

[Docket No. PHMSA–2005–17463 (HM–220E)]

RIN 2137–AD91

Hazardous Materials: Requirements for UN Cylinders

AGENCY: Pipeline and Hazardous Materials Safety Administration (PHMSA), DOT.

ACTION: Notice of proposed rulemaking.

SUMMARY: PHMSA proposes to amend the Hazardous Materials Regulations (HMR) to adopt standards for the design, construction, maintenance and use of cylinders and multiple-element gas containers (MEGCs) based on the standards contained in the United Nations (UN) Recommendations on the Transport of Dangerous Goods. Aligning the HMR with the UN Recommendations will promote flexibility, permit the use of technological advances for the manufacture of pressure receptacles, provide for a broader selection of pressure receptacles, reduce the need for exemptions, and facilitate international commerce in the transportation of compressed gases.

DATES: Comments must be received by July 7, 2005.

ADDRESSES: You may submit comments to Docket No. PHMSA–05–17463 (HM–220E) by any of the following methods:

- *Federal eRulemaking Portal:* Go to *http://www.regulations.gov.* Follow the online instructions for submitting comments.
- *Web Site: http://dms.dot.gov.* Follow the instructions for submitting comments on the DOT electronic docket site.
- *Fax:* 202– 493–2251.
- *Mail:* Docket Management System; U.S. Department of Transportation, 400 Seventh Street, SW., Nassif Building, Room PL–401, Washington, DC 20590–0001.
- *Hand Delivery:* Docket Management System; Room PL–401 on the plaza level of the Nassif Building, 400 Seventh Street, SW., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal Holidays.

Instructions: All submissions must include the agency name and docket number or Regulatory Identification Number (RIN) for this rulemaking. Comments should identify the docket number (PHMSA–05–17463). If sent by mail, comments are to be submitted in duplicate. Persons wishing to receive confirmation of receipt of their comments should include a self-addressed stamped postcard. Internet users may access all comments received by the Department of Transportation at *http://dms.dot.gov.* Note that all comments received will be posted without change to *http://dms.dot.gov* including any personal information provided. Please see the Privacy Act heading under Regulatory Analyses and Notices.

Docket: For access to the docket to read background documents or comments received, go to *http://dms.dot.gov* at any time or to Room PL–401 on the plaza level of the Nassif Building, 400 Seventh Street, SW., Washington, DC between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Duane Pfund, telephone number (202) 366–0656, Assistant International Standards Coordinator; Mark Toughiry, telephone number (202) 366–4545, Office of Hazardous Materials Technology; or Sandra Webb, telephone number (202) 366–8553, Office of Hazardous Materials Standards, Research and Special Programs Administration, U.S. Department of Transportation, Washington, DC 20590–0001.

SUPPLEMENTARY INFORMATION:

List of Topics

I. Background

On October 30, 1998, the Research and Special Programs Administration (RSPA), the predecessor agency to the Pipeline and Hazardous Materials Safety Administration (PHMSA, we), published a notice of proposed rulemaking (NPRM) under Docket HM–220 (63 FR 58460). In the NPRM, we proposed, among other changes, to amend the Hazardous Materials Regulations (HMR; 49 CFR parts 171–180) to establish four (4) new metric-marked DOT cylinder specifications to replace twelve (12) current cylinder specifications. The proposed specifications were more performance-oriented than the current DOT cylinder specifications, and were based, in part, on draft standards developed by the International Standards Organization (ISO) and the European Committee for Standardization.

Most commenters objected to adoption of specifications based on draft ISO standards. These commenters were concerned that the draft ISO standards could be changed and that cylinders manufactured to the draft standards might not be accepted for transportation in the world market. The commenters requested that we delay consideration of the proposed metric-marked cylinder specifications until the ISO completed its work on the international cylinder standards, and the UN Sub-Committee of Experts on the Transport of Dangerous Goods incorporated the ISO standards into the UN Recommendations on the Transport of Dangerous Goods (UN Model Regulations). Based on the merits of those comments, we agreed that the proposed metric-marked cylinder standards and related proposals that were based on draft ISO standards should not be adopted. On February 13, 2002, we published a notice withdrawing the metric-marked cylinder standards and related proposals and transferring the remaining proposals to Docket No. HM–220D (67 FR 6667) that was finalized August 8, 2002 (67 FR 51626).

The UN Model Regulations establish international standards for the safe transportation of hazardous materials. The UN Model Regulations are not regulations, but rather recommendations issued by the UN Sub-Committee of Experts on the Transport of Dangerous Goods (UN Sub-Committee of Experts). These recommendations are amended and updated biennially by the UN Sub-Committee of Experts. They serve as the basis for national, regional, and international modal regulations,

including the International Maritime Dangerous Goods (IMDG) Code issued by the International Maritime Organization, and the International Civil Aviation Organization Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions) issued by the ICAO Dangerous Goods Panel. The HMR authorize domestic transportation of hazardous materials shipments prepared in accordance with the IMDG Code if all or part of the transportation is by vessel, subject to certain conditions and limitations, and the transportation of hazardous materials shipments prepared in accordance with the ICAO Technical Instructions for transportation by aircraft and by motor vehicle either before or after being transported by aircraft.

Since 1999, the UN Sub-Committee of Experts has been working to develop international standards for the design, construction, inspection, and testing of cylinders and other pressure receptacles for inclusion in the UN Model Regulations. The objective was to develop requirements that can be globally accepted for international transportation, storage, and use. Representatives from the European Industrial Gases Association, the Compressed Gas Association, the European Cylinder Makers Association, the International Standards Organization Technical Committee 58 (ISO/TC 58), and many specialist government officials, including cylinder experts from DOT, participated in the UN Sub-Committee of Experts' efforts.

The standards developed for cylinders and other gas receptacles address manufacture, approval, filling, and use. The cylinders and other gas receptacles must be in compliance with ISO standards for design, manufacture, and testing; constructed of materials that are compatible with the gas to be contained in the cylinder, as established in ISO standards; and periodically inspected according to ISO standards. The standards were adopted by the UN Sub-Committee of Experts in 2001 and 2004 and are included in the 13th and 14th Edition of the UN Model Regulations. Cylinders manufactured in accordance with these requirements are marked with the internationally recognized UN mark, which ensures that the cylinders are acceptable world-wide.

The continually increasing amount of hazardous materials transported in international commerce warrants the harmonization of domestic and international requirements to the greatest extent possible. Harmonization serves to facilitate international transportation and at the same time ensures the safety of people, property and the environment. While the intent of the harmonization rulemakings is to align the HMR with international standards, we review and consider each amendment on its own merit. Each amendment is considered on the basis of the overall impact on transportation safety and the economic implications associated with its adoption into the HMR. Our goal is to harmonize without sacrificing the current HMR level of safety and without imposing undue burdens on the regulated public. To this end, we are proposing to adopt the UN standards for cylinders (pressure receptacles limited to a water capacity of 150 L), tubes (pressure receptacles with a water capacity exceeding 150 L and not more than 3,000 L capacity), cylinder bundles (cylinders held together in a frame and manifolded together with up to a total water capacity of 3,000 L or 1,000 L for toxic gases), and multiple element gas containers (MEGCs) into the HMR. Our proposal does not remove existing requirements for DOT specification cylinders; rather, we propose to incorporate the UN standards so that a shipper may use either a DOT specification cylinder or a UN standard pressure receptacle as appropriate for individual gases and circumstances. The goal of this rulemaking is to promote flexibility and permit the use of advanced technology for the manufacture and use of pressure receptacles, to provide for a broader selection of authorized pressure receptacles, reduce the need for exemptions, and to facilitate international transportation.

DOT technical experts participated in evaluating the ISO standards on which the UN Model Regulations applicable to pressure receptacles are based. We believe that the design, manufacturing, and test requirements provide an equivalent level of safety as the DOT cylinder requirements. Copies of the ISO standards are available for review in the public docket for this rulemaking. The public docket may be viewed in Room PL–401 of the Nassif Building, 400 7th Street, SW., Washington, DC 20590.

II. Overview of Proposed Changes in This NPRM

This NPRM proposes to amend the HMR to incorporate:

—Design, construction and testing requirements for refillable seamless aluminum alloy cylinders conforming to ISO 7866;

—Design, construction and testing requirements for refillable seamless steel cylinders conforming to ISO 9809–1, ISO 9809–2, and ISO 9809–3;

—Design, construction and testing requirements for non-refillable metallic cylinders conforming to ISO 11118;

—Design, construction and testing requirements for composite cylinders conforming to ISO 11119–1, 11119–2 and 11119–3, with certain limitations;

—Design, construction and testing requirement for refillable seamless steel tubes with a water capacity between 150 L and 3,000 L conforming to ISO 11120;

—Design, construction and testing requirements for UN acetylene cylinders conforming to applicable ISO standards, except the cylinders must be refillable, made of stainless steel, filled with a suitable quantity of solvent (solvent-free not authorized) and fitted with suitable fusible plugs;

—Design, construction and testing requirements for MEGCs;

—Requalification of UN pressure receptacles, including pressure receptacles installed as components of MEGCs;

—A quality conformity assessment system for UN pressure receptables consistent with section 6.2.2.5 of the UN Model Regulations;

—A 10-year requalification interval for UN pressure receptacles, except for acetylene and composite cylinders and pressure receptacles used for certain specifically named gases; and

—Filling densities prescribed in P200 of the UN Model Regulations for UN pressure receptacle or the requirements in proposed § 173.302b or § 173.304b in this NPRM.

Consistent with the current HMR, we are proposing to require UN pressure receptacles to meet the pressure relief requirements in § 173.301(f), and aluminum alloy oxygen cylinders to have straight (parallel) threads. In addition, we are proposing to require each new UN pressure receptacle and MEGC design type to be approved by the Associate Administrator and marked with the letters ''USA,'' to identify the United States of America as a country of approval. The USA country of approval marking will be required on all UN pressure receptacles manufactured within or being shipped to, from, or within the United States.

III. UN Pressure Receptacles and MEGCs—Design and Construction Requirements

The UN Model regulations define four types of gas pressure receptacles—gas cylinder, pressure drum, tube and bundle of cylinders. As defined in the UN Model Regulations, a *cylinder* is a

pressure receptacle with a water capacity not exceeding 150 liters. A *pressure drum* is a welded pressure receptacle with a water capacity exceeding 150 liters but not more than 1,000 liters. A *tube* is a seamless pressure receptacle with a water capacity exceeding 150 liters but not more than 3,000 liters. A *bundle of cylinders* is an assembly of cylinders that is fastened together, interconnected by a manifold and transported as a unit; the total water capacity of the bundle may not exceed 3,000 liters, or 1,000 liters when used for Division 2.3 gases.

In this NPRM, we are proposing to adopt the UN Model Regulations requirements for seamless cylinders and tubes, bundles of cylinders, and MEGCs. The ISO has not finalized its design and construction standards for pressure drums or welded cylinders; therefore, we are not proposing to adopt these pressure receptacle requirements in this NPRM. Thus, the term ''pressure receptacle'' as used in this NPRM refers to cylinders and tubes.

We are proposing to provide for a wider selection of pressure receptacles by providing for cylinders, tubes, and MEGCs constructed and certified to the referenced ISO standards and Part 178 requirements. Our present DOT certification system for domestically manufactured seamless cylinders, with the exception of the 3B, 3BN and 3E specifications, requires inspections and verifications of newly produced cylinders to be performed by independent inspection agencies (IIAs). With the exception of cylinders manufactured outside the United States and certain exemption cylinders, PHMSA does not conduct an audit of the cylinder manufacturer's operations prior to initial manufacture.

In this NPRM, we are proposing to require each facility that manufactures UN pressure receptacles within the United States and foreign manufacturers of UN pressures receptacles used for transporting hazardous materials to, from or within the United States to be approved by the Associate Administrator. Approval of a pressure receptacle manufacturer will be accomplished through approval of:

—*Each initial pressure receptacle design type.* Prior to manufacture, each manufacturer of UN pressure receptacles will be required to have each initial pressure receptacle design type reviewed by an IIA and approved by the Associate Administrator.

—*The pressure receptacle manufacturer's quality system.* Each manufacturer of UN pressure receptacles will be required to have its quality system documented in the form of written policies, procedures, and instructions. A manufacturer's technical knowledge, skill and integrity are some factors that provide assurance to pressure receptacle purchasers and the general public that pressure receptacles comply with the HMR and are safe transport of hazardous materials. The current HMR requirements contain no formalized criteria for the assessment of these factors. Each manufacturer will be required to demonstrate its knowledge and technical expertise by manufacturing a production lot while being audited by PHMSA personnel.

—*The production IIA.* During the production run, this IIA has the responsibility for ensuring that each pressure receptacle produced by the manufacturer conforms to the applicable specification requirements. The current application procedures for IIAs in Subpart I of Part 107 would apply. During PHMSA's audit of the pressure receptacle manufacturer, the production IIA will be required to perform all prescribed inspections and verifications during the production run.

—The proposed requirements in §§178.69 and 178.70 for the design and construction of pressure receptacles are consistent with those in the UN Model Regulations, except as noted in the following discussions. All pressure receptacles and MEGCs designed and constructed in full conformance with the applicable requirements will be marked with the UN designation, the letters ''USA,'' and the manufacturer's approval number. Any UN pressure receptacle or MEGC not marked in this manner and with the letters ''USA'' as a country of approval will not be authorized to be filled, offered or accepted for transportation within the United States. We believe this approach will maintain the high level of safety existing within the United States while facilitating trade worldwide.

A. Refillable Seamless Steel Cylinders

This NPRM proposes to allow the use of refillable seamless steel cylinders designed, constructed, and tested to the following standards:

ISO 9809–1 ''Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 1: Quenched and tempered steel cylinders with tensile strength less than 1100 MPa.'' This standard specifies minimum requirements for the material, design, construction and workmanship, manufacturing processes, and tests at manufacture for refillable quenched and tempered seamless steel gas cylinders with water capacities from 0.5 liter up to and including 150 liters. ISO 9809–1 is applicable to cylinders with a maximum tensile strength of 1,100 MPa for chrome-molybdenum steels or 1,030 MPa for carbon-manganese steels. However, a lower tensile strength applies when there is a risk of hydrogen embrittlement. The materials of construction are similar to those of DOT 3AA specification cylinders made of carbon manganese alloy steel.

ISO 9809–2 ''Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1100 MPa.'' This standard specifies minimum requirements for the material, design, construction and workmanship, manufacturing processes, and tests at manufacture for refillable quenched and tempered seamless steel gas cylinders with water capacities from 0.5 liter up to and including 150 liters. ISO 9809–2 is applicable to cylinders with maximum tensile strength of greater than or equal to 1,100 MPa.

ISO 9809–3 ''Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 3: Normalized steel cylinders.'' This standard specifies minimum requirements for the material, design, construction and workmanship, manufacturing processes, and tests at manufacture for refillable normalized or normalized and tempered seamless steel gas cylinders with water capacities from 0.5 liter up to and including 150 liters. Materials for the manufacture of normalized or normalized and tempered gas cylinders are generally classified as carbon-steels, carbon-manganese or manganese-molybdenum steels. The maximum tensile strength for cylinders made from these steels may not exceed 800 MPa. The materials of construction are similar to those of DOT 3A specification cylinders made of carbon or carbon manganese steel. ISO–9809–3 provides that other steels permitted in ISO 9809–1 or ISO 9809–2 for quenched and tempered cylinders may be used and subjected to normalizing and tempering, provided they additionally pass the impact test requirements specified in ISO 9809–1, and the tensile strength does not exceed 950 MPa.

Cylinders with water capacities less than 0.5 liter may also be manufactured and certified to ISO 9809–1, 9809–2 and 9809–3. Cylinders conforming to these standards are authorized for compressed, liquefied, and dissolved gases. These ISO 9809 standards require

that, following final heat treatment at manufacture, all cylinders except those selected for batch testing must be subjected to a hydraulic proof pressure test or a hydraulic volumetric expansion test. The standards permit the purchaser and the manufacturer to decide whether to perform the proof pressure test or volumetric expansion test. We consider the proof pressure test to be essentially a leak test. We are proposing to require this test to be a volumetric expansion test. The volumetric expansion test measures the cylinder's elastic expansion and ensures the adequacy of the physical properties of each cylinder. Further, this initial elastic expansion measurement offers a reference point, or benchmark, for use by requalifiers in evaluating whether the cylinder's wall elastic expansion remains within the prescribed parameters and the cylinder is safe for continued use.

B. Refillable Seamless Steel Tubes

This NPRM proposes to allow use of refillable seamless steel tubes designed, constructed, and tested to the following standard: *ISO 11120* ''Gas cylinders—Refillable seamless steel tubes of water capacity between 150 L and 3,000 L—Design, construction and testing.'' This standard specifies minimum requirements for the material, design, construction and workmanship, manufacturing processes, and tests at the time of manufacture for refillable quenched and tempered seamless steel tubes with water capacities from 150 liters up to and including 3,000 liters for compressed and liquefied gases. ISO 11120 is applicable to tubes with a maximum tensile strength of less than 1,100 MPa, except tubes intended for hydrogen bearing gases are limited to a maximum tensile strength of 950 MPa.

C. Refillable Seamless Aluminum Alloy Cylinders

This NPRM proposes to allow use of refillable seamless aluminum alloy cylinders designed, constructed, and tested to the following standard: *ISO 7866* ''Gas cylinders—Refillable seamless aluminum alloy gas cylinders—Design, construction and testing.'' This standard specifies minimum requirements for the material, design, construction and workmanship, manufacturing processes, and tests at manufacture for refillable seamless aluminum alloy gas cylinders with water capacities from 0.5 liter up to and including 150 liters. The cylinders are for compressed, liquefied, and dissolved gases, other than acetylene.

The UN Model Regulations permit the use of either tapered or straight (parallel) threads in aluminum alloy oxygen cylinders through the incorporation by reference of other ISO standards. However, we are not proposing to allow the use of tapered threads in aluminum alloy cylinders used in oxygen service and transported in the United States. This is consistent with § 173.302(b) of the HMR, which requires each aluminum oxygen cylinder opening to be configured with straight threads only. Requiring the use of straight threads eliminates the possibility of a tapered threaded valve being inadvertently inserted into a straight threaded cylinder opening. Such a mismatch or cross connect could lead to a violent expulsion of the tapered thread valve or unintended release of oxygen.

Within the United States, there are 20 million or more DOT 3AL aluminum alloy cylinders in oxygen service equipped with straight threads. Allowing the use of UN aluminum alloy oxygen cylinders with tapered threads, could increase the potential for inserting improper valves, even though the UN cylinders will be marked with the thread type code, *e.g.* 18P for straight or 25E for tapered. Persons who are not familiar with the ISO thread type codes may assume that the aluminum alloy oxygen cylinder is equipped with straight threads.

The European countries have widely used tapered threads for all gas services; therefore, this mismatching concern may not exist. Although our experience within the United States is with straight thread designs, the use of both thread designs may offer certain advantages. We are asking commenters to address the impact of retaining the prohibition against using tapered threads in aluminum alloy oxygen cylinders.

D. Refillable Seamless Acetylene Cylinders

This NPRM proposes to allow use of refillable acetylene cylinders complying with ISO 9809–1 or ISO 9809–3 and ISO 3807–2 ''Cylinders for acetylene—Basic requirements—Part 2: Cylinders with fusible plugs.'' ISO 9809–1 and ISO 9809–3 specify the details for design of the cylinder shell. ISO 3807–2 specifies the basic requirements for acetylene cylinders with a maximum nominal water capacity of 150 liters, with shells made from steel and equipped with fusible plugs. It includes procedures for type testing, production batch testing, and the methods for determining the maximum permissible settled pressure in acetylene cylinders and the porosity of the porous mass.

The UN Model Regulations also allow acetylene cylinder shells to be made of aluminum alloy conforming to ISO 7866. We are not proposing to allow the use of aluminum shells for acetylene cylinders transported in the United States. At manufacture, the cylinder shells are filled with a porous mass material and heat cured. The curing temperatures of the porous mass typically range from 260 °C (500 °F) to 371 °C (700 °F) for 24 to 48 hours, depending on the size of the cylinder, until the filler hardens. Exposing an aluminum cylinder to sustained high temperatures over long periods of time may adversely affect the structural integrity of the aluminum, thus making the cylinders unsafe for transportation. Because of this safety concern, we are proposing in this NPRM not to allow the manufacture and use of UN aluminum acetylene cylinders in the United States.

In addition, paragraph 6.2.2.1.3 of the UN Model Regulations allows the manufacture and use of non-refillable acetylene cylinders without fusible plugs. The HMR do not authorize the manufacture or use of non-refillable acetylene cylinders with or without fusible plugs. We have no shipping experience or safety data on the transportation of non-refillable acetylene cylinders. Therefore, we are proposing that acetylene cylinders must be constructed of seamless steel, be refillable and equipped with fusible plugs. We are proposing to prohibit acetylene cylinders not meeting the proposed requirements from transportation and use in the United States.

E. Non-Refillable Metallic Cylinders

This NPRM proposes to allow use of non-refillable metallic cylinders designed, constructed and tested to the following standard: *ISO 11118* ''Gas cylinders—Non-refillable metallic gas cylinders—Specification and test methods.'' This standard specifies minimum requirements for the material, design, construction and workmanship, manufacturing processes, and test at manufacture for non-refillable metallic gas cylinders of welded, brazed or seamless construction for compressed, liquefied and dissolved gases. As stated above in this preamble, we are proposing not to allow the manufacture or use of non-refillable acetylene cylinders.

F. Refillable Composite Cylinders

This NPRM proposes to allow use of refillable composite cylinders designed, constructed, and tested to the following standards:

ISO 11119–1 ''Gas cylinders of composite construction—Specification and test methods—Part 1: Hoop wrapped composite gas cylinders.'' This

standard specifies requirements for composite gas cylinders up to and including 450 liters water capacity, for compressed or liquefied gases with test pressures up to and including 650 bar. The cylinders consist of a seamless metallic liner over-wrapped with carbon fiber, aramid fiber, or glass fiber (or a combination thereof) in a resin matrix, or steel wire, to provide circumferential reinforcement.

ISO 11119–2 ''Gas cylinders of composite construction—Specifications and test methods—Part 2: Fully wrapped fibre reinforced composite gas cylinders with load-sharing metal liners.'' This standard specifies requirements for composite gas cylinders up to and including 450 liters water capacity, for compressed or liquefied gases with test pressures up to and including 650 bar. The standard addresses fully-wrapped composite cylinders with a load-sharing liner consisting of a seamless metallic liner over-wrapped with carbon fiber, aramid fiber, or glass fiber (or a combination thereof) in a resin matrix, to provide circumferential reinforcement.

ISO 11119–3 ''Gas cylinders of composite construction—Specifications and test methods—Part 3: Fully wrapped fibre reinforced composite gas cylinders with non-metallic and non-load-sharing metal liners.'' This standard specifies requirements for composite gas cylinders up to and including 450 liters water capacity, for compressed or liquefied gases with test pressures up to and including 650 bar. The cylinders are fully-wrapped composite cylinders with a non-load-sharing metallic or non-metallic liner. The cylinders consist of a liner over-wrapped with carbon fiber or aramid fiber or glass fiber, or a mixture thereof, in a resin matrix to provide longitudinal and circumferential reinforcement.

Depending on their construction, the UN Model Regulations specify design life for composite cylinders certified to ISO 11119–1, 11119–2 and 11119–3 from a minimum design life of 10 years to an unlimited life. We are proposing to require composite cylinders to be designed and constructed to the unlimited life requirements while limiting the service life to not more than 15 years from the date of manufacture. Under the HMR, composite cylinders are currently authorized for construction only under the terms of a DOT exemption. The 15-year service life limitation is consistent with that imposed on composite cylinders authorized under exemptions.

The ISO–11119–3 standard was adopted by the UN Sub-Committee of Experts in December 2004 for the manufacture and use of fully-wrapped composite cylinders with non-metallic and non-load-sharing metal liners. This standard also applies to composite cylinders without liners. Our experience within the United States is with fully-wrapped carbon-fiber reinforced (CFFC) and fiber reinforced plastic (FRP) composite aluminum-lined cylinders. We have no safety data on the use of composite cylinders with non-metallic and non-load-sharing metal liners or without liners. In this NPRM, we are proposing to prohibit in the United States the manufacture and use of fully-wrapped composite cylinders without liners. Under this proposal, ISO–11119–3 cylinders must have either a metallic or non-metallic (plastic) liner. Since the stress distribution of both ISO 11119–2 and 3 designs is handled by the composite shell rather than the liner, the major concern for plastic-lined cylinders made in accordance with ISO 11119–3 is the permeation of toxic and flammable gases at high temperature ranges (130–154 °F). Therefore, in this NPRM we are proposing to prohibit the transportation of toxic gases or toxic gas mixtures meeting the criteria for Division 2.3, Hazard Zone A or B, in ISO 11119–3 cylinders. When used for Division 2.1 materials, the cylinder will be required to have a working pressure not to exceed 62 bar. We are also proposing to prohibit the use of ISO 11119–3 cylinders for underwater breathing applications because of the effects of saltwater on some resins.

G. MEGCs

A MEGC is an assembly of UN cylinders, tubes, or bundles of cylinders interconnected by a manifold and assembled within a framework. The term includes all service equipment and structural equipment necessary for the transport of the gases. We are proposing to prescribe the design type approval procedures and the manufacturing specification requirements for MEGCs in new §§ 178.74 and 178.75 respectively. The proposed requirements are based on the provisions in § 178.275 of the HMR and paragraph 6.7.5 of the UN Model Regulations.

IV. Pressure Receptacles—Initial and Subsequent Design Type Review and Approval Process

We are proposing to implement a conformity assessment system consistent with section 6.2.2.5 in the UN Model Regulations. Under this conformity assessment system, PHMSA, as the United States Competent Authority, will be responsible for implementing a system for providing overall approval of each pressure receptacle design type, the manufacturer's quality system, and inspection bodies. The conformity assessment system requirements in the UN Model Regulations were adopted on the basis of the requirements in ISO Technical Report 14600. The requirements are based on the practices used in Europe, Canada, and the United States for ensuring that cylinder quality is consistent with that prescribed in the ISO design and construction standards.

The initial design type approval consists of an approval of the manufacturer's quality system and of the pressure receptacle design to be produced. (The manufacturer's quality system is discussed later in this preamble.) Under the proposed procedures for approval of the pressure receptacle design type, the manufacturer will select an inspection body, which, as proposed in this NPRM, will be an IIA approved by the Associate Administrator in accordance with the current procedures in Subpart I of Part 107. The manufacturer will submit an application for an initial design type approval to the IIA for review.

The IIA will examine the manufacturer's application for an initial design type approval for completeness. If the application is incomplete, it will be returned to the manufacturer with an explanation. If the IIA verifies that the design conforms to the applicable standards and the requirements contained in Part 178 of the HMR, the manufacturer will fabricate a prototype lot of pressure receptacles in accordance with the design specification. The IIA will verify that the prototype lot conforms to the applicable requirements by witnessing the testing of selected pressure receptacles. If the prototype tests indicate that the pressure receptacles conform to all applicable requirements, the IIA will prepare a design type approval certificate and return the certificate documentation to the manufacturer. The manufacturer will submit the design application to the Associate Administrator for approval. Each application for an initial design type approval must contain the information specified in proposed § 178.70, which includes: (1) The manufacturer's name and the manufacturing facility's address; (2) the designation of the pressure receptacle and the relevant pressure receptacle standard; (3) details of any similar approval application submitted to and denied by another country's competent authority; (4) technical documentation required for design type approval, such as design standards, manufacturing drawings, and design calculations; (5) test reports of the manufactured

prototype lot; and (6) documentation on the manufacturer's quality system.

If the application, design drawings, and quality control documents are found satisfactory, PHMSA will schedule an on-site audit to assess the manufacturing and inspection processes, and test procedures. During the audit by PHMSA personnel, the manufacturer will be required to produce a group of cylinders to the technical standards for which approval is sought. During the production run, the production IIA will perform the required inspections and tests of newly manufactured cylinders. If the procedures and controls are deemed acceptable, test sample cylinders will be selected at random from the production lot and sent to a laboratory designated by PHMSA for verification testing. If the cylinder test samples are found to conform to all the applicable requirements, the Associate Administrator will issue approvals to the manufacturer and the production IIA to authorize the manufacture of the pressure receptacles. The manufacturer will bear the cost of the audit and verification testing.

Under the system proposed in this NPRM, a manufacturer will be required to apply for a new design approval from the Associate Administrator for each new pressure receptacle design type or modification to an approved UN design type. A pressure receptacle will be considered to be of a new design, as specified in the referenced ISO design, construction, and testing standards, when:

1. It is manufactured at a different facility;
2. It is manufactured by a different process;
3. It is manufactured from a material with chemical and mechanical properties different from those specified in the standard;
4. Heat treatment differs from that specified in the standard;
5. The base profile has changed (*e.g.*, concave, convex, hemispherical) or there is a change in the base thickness/cylinder diameter ratio;
6. The overall length of the cylinder has increased by more than 50%;
7. The nominal outside diameter has changed;
8. The design wall thickness has changed;
9. The hydraulic test pressure has been increased; or
10. The guaranteed minimum yield strength and/or the guaranteed minimum tensile strength has changed.

Requests for subsequent UN design type approvals will be reviewed by an IIA for design type approval, and approved by the Associate Administrator. The production IIA and the manufacturer will retain a set of the pressure receptacle design type approval documents for a minimum of 20 years. PHMSA has the authority to modify, suspend or terminate an approval certificate upon evidence that information upon which the approval was based is fraudulent or substantially erroneous, or such action is necessary to adequately protect against risks to life or property. The conditions for suspension or termination of an approval are in proposed § 178.70.

V. MEGCs—Initial Design Type Review and Approval Process

We are proposing to require MEGCs to be reviewed by an approval agency with authorization under the procedures in subpart E of Part 107. The elements (pressure receptacle) installed in the MEGC will be approved as described in section IV of this preamble. The application procedure will be similar to that currently prescribed for the approval of IM and UN portable tanks in § 178.273. The MEGC's manufacturer will submit the application to the approval agency. Each application must include all engineering drawings and calculations necessary for the approval agency to ensure that the MEGC design complies in all respects with the requirements in proposed § 178.75 and documentation showing that the cylinders or tubes comprising the MEGC assembly are approved. An incomplete application will be returned to the applicant with an explanation.

If an application is complete, the approval agency will review the design and arrange with the MEGC manufacturer to witness all required tests. Upon satisfactory completion of the prototype testing, the approval agency will prepare a design type approval certificate and return the certificate and documentation to the manufacturer. The manufacturer will submit the certificate and an approval application to the Associate Administrator. If the application and supporting documentation of the examination and tests performed are acceptable, the Associate Administrator will approve the certificate. The approval agency will be required to maintain a set of the approved drawings and calculations for each MEGC design it reviews and a copy of each initial design type approval certificate approved by the Associate Administrator for at least 20 years. The approval agency will ensure that each MEGC is manufactured to the design type and fully conforms to the applicable requirements. The approval agency will issue a certificate of compliance for each MEGC that is manufactured. The MEGCs will be certified and UN marked as prescribed in proposed § 178.75.

VI. Qualification and Approval Process for Persons Performing Pressure Certifications

A. Inspection Bodies

1. Independent Inspection Agencies (IIAs)

Current § 107.803 of the HMR contains procedures and application criteria for a person seeking approval as an IIA to perform cylinder manufacture, repair or modification inspections and verifications prescribed in Parts 178 and 180. We propose to revise these requirements to include UN pressure receptacles. We are proposing to expand the criteria contained in § 107.803 to permit the selection of any person or organization, foreign as well as domestic, for the duties of an IIA, that is technically competent to perform the prescribed functions. That person or organization must be free from undue influence by persons involved with the fabrication, ownership or movement of the cylinders that the applicant, if approved, would be called upon to evaluate and certify. If an applicant seeking approval to perform the functions of an IIA has its principle place of business in a country other than the United States, the Associate Administrator may approve the applicant on the basis of an approval issued by the Competent Authority of a foreign government. We will recognize UN pressure receptacles manufactured outside the United States and certified by an inspection body certified by another government if that government similarly accepts pressure receptacles manufactured in the United States and approved by an IIA approved by DOT. A foreign inspection body seeking approval from DOT to certify pressure receptacles manufactured outside the United States must submit evidence from that country stating that similar authority is delegated to IIAs and manufacturers of UN pressure receptacles in the United States and that no additional limitations are imposed that are not required of its own citizenry.

2. Approval Agencies

Approval of MEGCs will be handled similarly to the approval of UN portable tanks. For a UN portable tank manufactured in the United States, we require the portable tank design type to be approved by an approval agency. The approval agency must be approved by the Associate Administrator under the procedures in Subpart E of Part 107. In new § 178.74 of this NPRM, we are proposing to require each new MEGC design type to be reviewed by a DOT

designated approval agency. Authorization to perform functions relating to MEGCs must be contained in the approval agency's letter of designation.

B. Manufacturers

The UN procedures for approval of a pressure receptacle manufacturer and the manufacturer's quality system are generally consistent with PHMSA's current procedures under § 107.807 for cylinder manufacturers located outside the United States who perform the chemical analyses and tests of cylinders manufactured to DOT specifications. PHMSA currently performs an on-site audit of the manufacturing and test facilities after a pre-audit has been performed of the manufacturer's prototype design by an IIA.

Under the proposed approval procedures, each manufacturer must have in place a documented quality system as outlined in proposed § 178.69. The manufacturer's quality system involves detailed documentation related to the UN pressure receptacles to be produced, and of written polices, procedures and instructions. The documentation must include (1) adequate descriptions of the organizational structure; (2) responsibilities of personnel with regard to design and product quality; (3) the design control and verification techniques; (4) cylinder manufacturing, quality control, quality assurance and operating instructions; (5) quality records, such as inspection reports, test data, and calibration data; (6) the process for control of documents and their revision; (7) means for control of non-conforming gas cylinders, purchased components, in-process and final materials; and (8) the training for relevant personnel.

The manufacturer's quality system will be audited by PHMSA during the final review of the initial design type approval, as prescribed in proposed § 178.70. The Associate Administrator may perform periodic audits of approved manufacturers to ensure that the manufacturer's quality controls are maintained according to established standards.

C. Requalifiers

Paragraph 6.2.2.6.2.1 of the UN Model Regulations provides that the competent authority must establish an approval system to ensure that the periodic inspection and testing of pressure receptacles conform to the specified requirements. Consistent with our current requirements in § 107.805, any person who requalifies UN pressure receptacles must be approved by the Associate Administrator. Before a cylinder requalifier is approved and issued a requalification identification number (RIN), it must undergo a review and inspection for compliance with DOT requalification procedures; demonstrate knowledge of DOT cylinder regulations, and verify the accuracy of the calibration test equipment. Initially, the applicant will be required to submit an application containing specific information about its testing equipment, procedures, and knowledge. PHMSA will review all submitted documents and, if found satisfactory, the person seeking approval as a requalifier of UN pressure receptacles must arrange for an IIA, approved by the Associate Administrator, to inspect its facility. If the on-site audit reveals that the company has the required knowledge, capabilities and equipment, the Associate Administrator may issue a RIN to that facility to requalify UN pressure receptacles.

VII. UN Cylinders and Tubes—Requalification Requirements

We are proposing to prescribe the requalification requirements for UN pressure receptacles in new § 180.207. Proposed Table I specifies the periodic requalification interval. The standard requalification interval is once every ten years, with certain noted exceptions. A shorter requalification interval of once every five years will apply to pressure receptacles used for any Division 2.3 material, certain specifically named gases, and composite cylinders. These proposed requalification intervals are consistent with those prescribed in the UN Model Regulations.

The requalification procedures for performing the inspections and test will be based on the applicable ISO standards, which depend on the pressure receptacle's material of construction. All refillable pressure receptacles must be given an internal and external visual inspection at the time the requalification is performed.

Steel UN pressure receptacles constructed to ISO 9809–1, 9809–2, 9809–3 with a tensile strength less than 950 MPa, will be required to be subjected to a visual examination and volumetric expansion pressure test in accordance with the procedures in ISO 6406. UN pressure receptacles constructed to ISO 9809–1 or ISO 9809–2 with a tensile strength greater than 950 MPa may be examined by a nondestructive method that is approved by the Associate Administrator. Aluminum UN pressure receptacles constructed to ISO 7866 will be required to be requalified in accordance with the procedures contained in ISO 10461. Both ISO 6406 and 10461 allow pressure receptacles to be pressure tested by either a volumetric expansion test or a proof pressure test, as appropriate for the design specification of the cylinder. We are proposing to require testing by the volumetric expansion test for pressure receptacles with a tensile strength of less than 950 MPa. The volumetric expansion test is an effective method for determining the elastic expansion, which is directly related to the wall thickness of the cylinder, and gives a numerical value that can be used to determine disposition of the cylinder. However, we are soliciting comments on whether requalification by a proof pressure test should be allowed under certain conditions. Note that as proposed in this NPRM, pressure receptacles with a tensile strength of 950 MPa or greater may be examined by a nondestructive method approved by the Associate Administrator.

UN acetylene cylinders will be required to be requalified at 10 year intervals in accordance with the procedures in ISO 10462, except the porous mass and shell must be requalified 3 years, +/−6 months from the date of manufacturer. UN composite cylinders will be required to be subjected to a complete visual inspection and a volumetric expansion test in accordance with the procedures in ISO 11623. These standards contain acceptance/rejection criteria for various types of defects or damage.

The ISO standards do not address the repair of pressure receptacles. We are proposing to authorize limited repair work to UN pressure receptacles, under the terms of an approval issued by the Associate Administrator under Subpart H of Part 107. However, certain repairs, such as the external rethreading of UN tubes for remounting in a MEGC will not require an approval, provided certain conditions are met. These provisions are in proposed § 180.212.

VIII. Pressure Receptacles—Filling Limits

We are proposing to adopt the UN requirements applicable to the filling of UN pressure receptacles. Packing Instruction P200 of the UN Model Regulations establishes certain conditions that must be met when filling UN pressure receptacles with compressed gases and liquefied compressed gases. For compressed gases, the maximum filling limit (filling density) must be such that the working pressure (service pressure) is not greater than two-thirds of the test pressure, and in no case may the internal pressure at 65 °C (149 °F) exceed the test pressure of

the pressure receptacle. For high pressure liquefied compressed gases, the filling limit must be such that the settled pressure at 65 °C (149 °F) will not exceed the test pressure of the pressure receptacles. For low pressure liquefied gases, the maximum mass of contents per liter of water capacity must be less than or equal to 0.95 times the density of the liquid phase at 50 °C (122 °F); in addition, the liquid phase may not fill the pressure receptacle at any temperature less than or equal to 60 °C (140 °F). The test pressure of the pressure receptacle must be at least equal to the vapor pressure (absolute) of the liquid at 65 °C (149 °F), minus 100 kPa (1 bar).

Packing Instruction P200 of the UN Model Regulations allows the maximum filling limit to be determined using specified formulas or filling ratio values provided for a given gas transported in cylinders with specified minimum test pressures. The formulas yield more conservative limits as compared to the values provided in Table 2 of P200 and are primarily intended to be used for gas mixtures. We are proposing to authorize any equally effective method for calculating the filling limits as long as the specified conditions for compressed and high and low pressure liquefied compressed gases are met. We are proposing in new § 173.304b to include the formulas and to allow the use of either the formulas or filling limits in Table 2 of P200 of UN Model Regulations. A research study conducted to verify the filling formulas and specified limits may be reviewed by accessing the docket to this rulemaking at *http://dms.dot.gov*.

IX. Summary of Proposed Regulatory Changes by Part

The following is a summary by part of the more significant proposals of this NPRM.

Part 107

Sections 107.801, 107.803, and 107.805 contain application procedures for persons seeking approval to certify the manufacture, repair, rebuild or requalification of DOT specification cylinders. We are revising these provisions to include UN pressure receptacles and MEGCs.

Part 171

In § 171.7, we are proposing to incorporate by reference several additional ISO standards, and in § 171.8, we are proposing to add definitions for ''bundles of cylinders,'' ''multiple element gas containers or MEGCs,'' ''UN cylinder,'' ''UN pressure receptacle,'' ''UN tube'' and ''working pressure.''

Sections 171.11, 171.12, and 171.12a permit hazardous materials to be transported in accordance with the ICAO Technical Instructions, the IMDG Code, and the Canadian Transport of Dangerous Goods (TDG) Regulations, respectively, under certain conditions. Each of these sections also includes a number of limitations applicable to such transportation. In this NPRM, we are proposing to add several limitations applicable to the use of DOT authorized cylinders and UN pressure receptacles transported in the United States under the ICAO Technical Instructions, the IMDG Code, and the TDG Regulations.

We are proposing to clarify that, notwithstanding the requirements of the ICAO Technical Instructions, IMDG Code, and TDG Regulations, each pressure receptacle transported in accordance with §§ 171.11, 171.12, and 171.12a must be equipped with a pressure relief device (PRD) when required by § 173.301(f) of the HMR. The UN Model Regulations, the ICAO Technical Instructions, IMDG Code, and the TDG Regulations provide that pressure receptacles must be equipped with a PRD when used for carbon dioxide (UN 1013), nitrous oxide (UN 1070) or required by the country of use. A PRD can prevent a dangerous build-up of pressure that could result in a cylinder leak or rupture. Therefore, in the interest of safety, pressure receptacles shipped to, from or within the United States must be fitted with PRDs consistent with the requirements in § 173.301(f), including the PRD requirements in CGA Pamphlet S–1.1. As discussed earlier in this preamble, we are also proposing to require that the prototype design for all UN pressure receptacles manufactured or used for transporting hazardous materials within the United States must be approved by the Associate Administrator. These requirements are applicable to each pressure receptacle, including those assembled in MEGCs and bundles. Each approved pressure receptacle will be required to be marked with the letters ''USA'' followed by the manufacturer's approval number. This approach will readily identify the approved pressure receptacles and provide assurance that any UN pressure receptacle imported for use within the United States will be similar in strength, durability and quality as the DOT specification and UN pressure receptacles manufactured within the United States. To obtain a design type approval, the pressure receptacle manufacturers will be required to comply with the approval and manufacturing requirements proposed in Part 178 of this NPRM. As a part of the approval process, the pressure receptacle manufacturer's quality system and operating processes must be audited by PHMSA personnel as discussed earlier in this preamble. We believe this approach will maintain the high level of safety existing within the United States while facilitating trade worldwide.

Readers should be aware that we are proposing other changes to §§ 171.11, 171.12, 171.12a and certain other sections addressed in this NPRM under separate rulemaking actions. Therefore, the requirements proposed herein, if adopted in a final rule, may be placed in a different paragraph or section.

Part 172

In § 172.101, we are proposing to make various amendments to the Hazardous Materials Table (HMT). In a final rule published July 31, 2003 (Docket No. RSPA 2002–13658 (HM–215E), 68 FR 44992), we revised eleven entries by removing the qualifying word ''compressed.'' The eleven entries are as follows:

1008	Boron triflouride
2417	Carbonyl fluoride
1911	Diborane
1962	Ethylene
2193	Hexafluoroethane or Refrigerant
2451	Nitrogen triflouride
2198	Phosphorous pentafluoride
2203	Silane
1859	Silicon tetrafluoride
1982	Tetrafluoromethane *or* Refrigerant gas R14
2036	Xenon

We made the revisions for consistency with another amendment that revised the reference temperature used in the definitions of a non-liquefied and liquified compressed gas § 173.115(d) and (e), respectively, from 20 °C (70 °F) to −50 °C (−58 °F), consistent with internationally accepted definitions for gases adopted in the Twelfth Edition of the UN Model Regulations.

We also divided the compressed liquefied gases into high and low pressure categories. In the July 31, 2003 final rule, we stated that in a separate rulemaking we would address whether the named gases should be reassigned to more appropriate packaging sections. We also stated that we would address the use of the high- and low-pressure compressed liquefied gas designations. Upon further consideration, we believe the packaging authorizations should remain in § 173.302 rather than being reassigned to other packaging sections. The UN Model Regulations define a ''compressed gas,'' as a gas that when packaged under pressure for transport, is entirely gaseous at −50 °C (−58 °F); this category includes all gases with a

critical temperature less than or equal to −50 °C (−58 °F). The UN Sub-Committee of Experts removed the descriptor ''compressed'' from the shipping names because the gases are partially liquid at temperatures above −50 °C (−58 °F) when packaged under pressure for transport. We believe these gases seldom encounter temperatures of −50 °C (−58 °F) and below when transported within the United States and, therefore, changing the packaging authorizations is not warranted. However, we are soliciting comments on whether the packaging authorization for these gases should remain as § 173.302 or be relocated to § 173.304.

We are proposing to add seven new special provisions to certain entries in the HMT. New special provision N86 would be added to 21 entries. The special provision prohibits the shipment of these gases in UN pressure receptacles made of aluminum. The 21 entries are as follows:

1001 Acetylene
1017 Chlorine
1037 Ethyl chloride
1045 Fluorine, compressed
1048 Hydrogen bromide, anhydrous
1050 Hydrogen chloride, anhydrous
1052 Hydrogen fluoride, anhydrous
1062 Methyl bromide
1063 Methyl chloride *or* Refrigerant gas R 40
1085 Vinyl bromide, stabilized
1086 Vinyl chloride, stabilized
1581 Chloropicrin and Methyl bromide mixture
1582 Chloropicrin and Methyl chloride mixture
1749 Chlorine trifluoride
1860 Vinyl fluoride, stabilized
1912 Methyl chloride and Methylene chloride mixture
2190 Oxygen difluoride, compressed
2196 Tungsten hexafluoride
2197 Hydrogen iodide, anhydrous
2548 Chlorine pentafluoride
2901 Bromine chloride

—New special provision N87 would be added to eight entries. The special provision prohibits the shipment of these gases in UN pressure receptacles with copper valves. The eight entries are:

1005 Ammonia, anhydrous
1032 Dimethylamine, anhydrous
1036 Ethylamine
1043 Fertilizer ammoniating solution *with free ammonia*
1061 Methylamine, anhydrous
1083 Trimethylamine, anhydrous
2073 Ammonia solution, *relative density less than 0.880 at 15°C in water, with more than 35% but not more than 50% ammonia.*
3318 Ammonia solution, *relative density less than 0.880 at 15°C in water, with more than 50% ammonia.*

—New special provision N88 would be added to three entries. The special provision provides that the UN pressure receptacle's metal parts in contact with the gas must contain no more than 65% copper. The three entries are:

1001 Acetylene, dissolved
1060 Methyl acetylene and propadiene mixtures, stabilized
2452 Ethylacetylene, stabilized

—New special provision N89 would be added to fourteen entries. The special provision provides that when steel UN pressure receptacles are used, only those bearing an ''H'' mark are authorized. The fourteen entries are:

1048 Hydrogen bromide, anhydrous
1049 Hydrogen, compressed
1050 Hydrogen chloride, anhydrous
1053 Hydrogen sulphide
1064 Methyl mercaptan
1911 Diborane
1957 Deuterium, compressed
2034 Hydrogen and Methane mixture, compressed
2188 Arsine
2192 Germane
2197 Hydrogen iodide, anhdrous
2199 Phosphine
2203 Silane
2600 Carbon monoxide and Hydrogen mixture, compressed

Part 173

In Part 173, we are proposing to add authorizations for the use of UN pressure receptacles in a number of sections consistent with the requirements in the UN Model Regulations. In § 173.40, we are proposing to limit a UN cylinder used for Hazard Zone A or B material to a maximum water capacity of 85 liters. The cylinder must have a minimum test pressure of 200 bar and a minimum wall thickness of 3.5 mm if made of aluminum alloy or 2 mm if made of steel or, alternatively, be packed in an outer packaging meeting the Packing Group I performance level. We are prohibiting the transport of Hazard Zone A material in UN tubes and MEGCs.

In § 173.301, we are proposing to revise the general requirements for shipment of hazardous materials in cylinders to apply to UN pressure receptacles. However, UN pressure receptacles would not be required to meet the requirements for cylinder valve protection in paragraph (h) and for cylinders mounted on a motor vehicle or in frames in paragraph (i). These particular requirements for UN pressure receptacles would be contained in new § 173.301b. The requirements applicable to MEGCs would be contained in new § 173.312.

New § 173.301b would contain additional general requirements for the shipment of hazardous materials in UN pressure receptacles. We are proposing that gas or gas mixtures must be compatible with the pressure receptacle and valve material in accordance with ISO 11114–1 for metallic materials or ISO 11114–2 for non-metallic materials. When a refillable pressure receptacle is filled with a gas different from that previously contained in the cylinder, prior to refilling, the cylinder must be cleaned in accordance with ISO 11621. A UN pressure receptacle must have its valve protected in accordance with the methods prescribed in § 173.301(h). Finally, under paragraph (g), a non-refillable UN pressure receptacle will be required to have a water capacity not exceeding 1.25 liters and must be transported as an inner packaging. The use of a non-refillable UN pressure receptacle would be prohibited for a toxic gas with an LC_{50} of 200 ml/mg or less.

New § 173.302b would contain the filling requirements for UN pressure receptacles used to transport non-liquefied (permanent) gases as discussed earlier in this preamble under the heading ''V. Pressure Receptacles—Filling limits.''

In § 173.303, we are proposing to authorize the use of UN cylinders and bundles of cylinders for acetylene. The cylinder must conform to the basic requirements and have fusible plugs in accordance with ISO 3807–2.

New § 173.304b would contain specific requirements for filling a UN pressure receptacle with a liquefied gas as discussed earlier in this preamble under the heading ''V. Pressure Receptacles—Filling limits.''

New § 173.312 would contain requirements for the use of MEGCs. A MEGC must conform to the design, construction, inspection and testing requirements contained in proposed § 178.75. Consistent with the requirements in the UN Model Regulations, each pressure receptacle used for other than a Division 2.2 permanent gas would be required to be equipped with an individual shutoff valve. Additionally, for a Division 2.1 gas, the pressure receptacles must be isolated by a valve into assemblies of not more than 3,000 liters. Consistent with the requirements for the manifolding of DOT specification cylinders in § 173.301(g), we are proposing that the pressure receptacles may not be filled in excess of the lowest marked working pressure of any given pressure receptacle.

In § 173.336, we are proposing to authorize the transport of nitrogen dioxide, liquefied and dinitrogen tetroxide, liquefied in UN cylinders.

The use of UN tubes and MEGCs would not be authorized. In addition, we are proposing to correct an inconsistency in the current requirements. We are adding a provision, currently contained in § 173.337, that requires the cylinders to be equipped with a stainless steel valve and valve seat that will not deteriorate if in contact with nitrogen dioxide. The provision would be removed in § 173.337.

Part 178

We propose to add several new sections to Part 178. Section 178.69 would contain the responsibilities and requirements applicable to manufacturers of UN pressure receptacles. Sections 178.70 and 178.71 would contain requirements for the approval of a new pressure receptacle design type and the manufacturing specifications for the pressure receptacle, respectively. Sections 178.74 and 178.75 would contain requirements applicable to the approval of a new MEGC design type and the manufacturing specifications for MEGCs, respectively. The requirements are discussed earlier in this preamble.

Part 180

We are proposing to revise the requirements in Subpart C in Part 180 to include the requalification of UN pressure receptacles and MEGCs. These requirements are discussed earlier in this preamble under the heading ''UN Cylinders and Tubes—Requalifications.''

X. Rulemaking Analyses and Notices

A. Statutory/Legal Authority for This Rulemaking

This NPRM is published under the following statutory authorities:

1. 49 U.S.C. 5103(b) authorizes the Secretary of Transportation to prescribe regulations for the safe transportation, including security, of hazardous material in intrastate, interstate, and foreign commerce. This NPRM will align the HMR with the UN Model Regulations, which will (1) promote flexibility; (2) permit the use of technological advances for the manufacture of pressure receptacles; (3) provide for a broader selection of pressure receptacles; (4) reduce the need for exemptions to the existing regulations; and (5) facilitate international commerce in the transportation of compressed gases while maintaining a level of safety at least equal to that achieved under the HMR. To this end, as discussed in detail earlier in this preamble, the final rule amends the HMR to more fully align it with the biennial updates of the UN Recommendations, the IMDG Code and the ICAO Technical Instructions to facilitate the transport of hazardous materials in international commerce.

2. 49 U.S.C. 5120(b) authorizes the Secretary of Transportation to ensure that, to the extent practicable, regulations governing the transportation of hazardous materials in commerce are consistent with standards adopted by international authorities. This NPRM amends the HMR to maintain alignment with international standards by incorporating various amendments to facilitate the transport of hazardous material in international commerce. To this end, as discussed in detail earlier in this preamble, the final rule incorporates changes into the HMR based on the Thirteenth Revised Edition of the UN Recommendation, Amendment 32 to the IMDG Code, and the 2005–2006 ICAO Technical Instructions, which became effective January 1, 2005. The continually increasing amount of hazardous materials transported in international commerce warrants the harmonization of domestic and international requirements to the greatest extent possible. Harmonization serves to facilitate international transportation; at the same time, harmonization ensures the safety of people, property, and the environment by reducing the potential for confusion and misunderstanding that could result if shippers and transporters were required to comply with two or more conflicting sets of regulatory requirements. While the intent of this rulemaking is to align the HMR with international standards, we review and consider each amendment on its own merit based on its overall impact on transportation safety and the economic implications associated with its adoption into the HMR. Our goal is to harmonize without sacrificing the current HMR level of safety and without imposing undue burdens on the regulated public. Thus, as discussed in detail earlier in this preamble, there are several instances where we elected not to adopt a specific provision of the UN Model Regulations, the IMDG Code or the ICAO Technical Instructions. Further, we are maintaining a number of current exceptions for domestic transportation that should minimize the compliance burden on the regulated community.

B. Executive Order 12866 and DOT Regulatory Policies and Procedures

This NPRM is a not considered a significant regulatory action under section 3(f) of Executive Order 12866 or the Regulatory Policies and Procedures of the Department of Transportation (44 FR 11034). This NPRM was not reviewed by the Office of Management and Budget. A regulatory evaluation is in the docket for this rulemaking.

This NRPM proposes to add provisions to the HMR, based on the standards contained in the United Nations Model Regulations, that would permit the design, construction, maintenance, and use of seamless UN pressure receptacles and MEGCs. The proposed changes would provide shippers with an optional means of compliance; therefore, any increased compliance costs associated with the proposals in this NPRM would be incurred voluntarily by the compressed gas industry. Ultimately, we expect each company to make reasonable decisions based on its own business operations and future goals. Thus, costs incurred if a company elects to manufacture or use UN pressure receptacles and MECGs would be balanced by the benefits (*e.g.*, access to foreign markets) accruing from this decision.

More broadly, this NPRM proposes to harmonize the requirements in the HMR for the manufacture and use of cylinders with international standards in the UN Model Regulations. Harmonization of the HMR with international standards will eliminate inconsistencies between the regulations, thereby facilitating efficient transportation of hazardous materials in pressure receptacles across national or international borders. More importantly, harmonized regulations reduce the potential for misunderstanding and confusion and, thus, enhance safety.

C. Executive Order 13132

This proposed rule has been analyzed in accordance with the principles and criteria contained in Executive Order 13132 (''Federalism''). This proposed rule would preempt State, local, and Indian tribe requirements but does not propose any regulation that has substantial direct effects on the States, the relationship between the national government and the States, or the distribution of power and responsibilities among the various levels of government. Therefore, the consultation and funding requirements of Executive Order 13132 do not apply.

The Federal hazardous materials transportation law, 49 U.S.C. 5101–5127, contains an express preemption provision (49 U.S.C. 5125(b)) that preempts State, local, and Indian tribe requirements on certain covered subjects. Covered subjects are:

(1) The designation, description, and classification of hazardous materials;

(2) The packing, repacking, handling, labeling, marking, and placarding of hazardous materials;

(3) The preparation, execution, and use of shipping documents related to hazardous materials and requirements related to the number, contents, and placement of those documents;

(4) The written notification, recording, and reporting of the unintentional release in transportation of hazardous material; or

(5) The design, manufacture, fabrication, marking, maintenance, recondition, repair, or testing of a packaging or container represented, marked, certified, or sold as qualified for use in transporting hazardous material.

This proposed rule addresses covered subject items (1), (2), (3), and (5) described above and would preempt State, local, and Indian tribe requirements not meeting the ''substantively the same'' standard. This proposed rule is necessary to harmonize domestic regulations for the transportation of hazardous materials in cylinders with international standards.

Federal hazardous materials transportation law provides at § 5125(b)(2) that, if DOT issues a regulation concerning any of the covered subjects, DOT must determine and publish in the **Federal Register** the effective date of Federal preemption. The effective date may not be earlier than the 90th day following the date of issuance of the final rule and not later than two years after the date of issuance. PHMSA proposes that the effective date of Federal preemption will be 90 days from publication of a final rule in this matter in the **Federal Register**.

D. Executive Order 13175

This proposed rule has been analyzed in accordance with the principles and criteria contained in Executive Order 13175 (''Consultation and Coordination with Indian Tribal Governments''). Because this proposed rule does not have tribal implications and does not impose direct compliance costs, the funding and consultation requirements of Executive Order 13175 do not apply.

E. Regulatory Flexibility Act and Executive Order 13272

The Regulatory Flexibility Act (5 U.S.C. 601–611) requires each agency to analyze proposed regulations and assess their impact on small businesses and other small entities to determine whether the proposed rule is expected to have a significant impact on a substantial number of small entities. This rule imposes only minimal new costs of compliance on the regulated industry. Based on the assessment in the regulatory evaluation, I hereby certify that while this rule applies to a substantial number of small entities, there will not be a significant economic impact on those small entities. A detailed Regulatory Flexibility analysis is available for review in the docket.

This proposed rule has been developed in accordance with Executive Order 13272 (''Proper Consideration of Small Entities in Agency Rulemaking'') and DOT's procedures and policies to promote compliance with the Regulatory Flexibility Act to ensure that potential impacts of draft rules on small entities are properly considered.

Need for the NPRM. Current requirements for the manufacture, use, and requalification of cylinders can be traced to standards first applied in the early 1900s. Over the years, the regulations have been revised to reflect advancements in transportation efficiency and changes in the national and international economic environment. The changes proposed in this NPRM would permit shippers to use either current DOT specification cylinders or the new seamless UN pressure receptacles and MEGCs for the transportation of compressed gases. This action is being taken to facilitate international transportation, increase flexibility for the regulated community and promote technological advancement while maintaining a comparable level of safety.

Description of action. In this NPRM, we are proposing to add optional requirements for the manufacture, maintenance, testing, and use of UN pressure receptacles and to adopt a qualification and approval process for persons who choose to certify refillable UN pressure receptacles.

Identification of potentially affected small entities. Businesses likely to be affected by the final rule are cylinder manufacturers, cylinder requalifiers, independent inspection agencies, and commercial establishments that own and use DOT specification cylinders. There are approximately three United States manufacturers of seamless pressure receptacles. In addition, the Associate Administrator has approved approximately 2,150 active domestic cylinder requalifiers and seven domestic independent inspection agencies. There are also approximately two facilities approved to perform seamless cylinder repairs. Cylinder requalifiers include businesses that manage large fleets of cylinders, such as cylinders filled with propane to power forklift trucks and for use by retail customers through cylinder exchange programs. There are literally hundreds of thousands of commercial establishments that own and use cylinders manufactured to DOT specifications. These business sectors include agriculture; mining; construction; manufacturing; transportation; communications; electric, gas, and sanitary services; wholesale trade; retail trade; and other services.

Unless alternative definitions have been established by the agency in consultation with the Small Business Administration (SBA), the definition of ''small business'' has the same meaning as under the Small Business Act. Since no such special definition has been established, we employ the thresholds published by SBA for industries subject to the HMR. Based on 1997 data compiled by the U.S. Census Bureau, it appears that upwards of 97 percent of firms subject to this final rule are small businesses. For the most part, these entities will incur minimal costs to comply with the provisions of this NPRM. The proposed provisions are optional; companies will choose to expand their operations to include UN pressure receptacles based on their ability to offset any additional costs.

Reporting and recordkeeping requirements. Consistent with the UN Model Regulations, the NPRM includes a new recordkeeping requirement for a proposed quality control system for facilities that manufacture UN pressure receptacles in the United States. The requirements will affect about 60 cylinder manufacturers; we anticipate that each manufacturer may incur minimal costs each year to comply with the new requirement.

Related Federal rules and regulations. With respect to the transportation of compressed gases in cylinders, there are no related rules or regulations issued by other department or agencies of the Federal government.

Alternate proposals for small business. While certain regulatory actions may affect the competitive situation of an individual company or group of companies by imposing relatively greater burdens on small rather than large enterprises, we do no believe that this will be the case with the proposed rule. The requirements for the manufacture, testing, and use of UN pressure receptacles as proposed in this NPRM are optional. Ultimately, we expect each company to make reasonable decisions based on its own business operations and future goals. Thus, the costs incurred if a company elects to manufacture or use UN pressure receptacles and MECGs would be balanced by the benefits (*e.g.*, access to foreign markets) accruing from this decision.

Conclusion. I certify that the proposals in this NPRM would not have a significant economic impact on a substantial number of small entities. The costs associated with this proposed rule will be assumed voluntarily based on a company's ability to offset the costs with benefits such as increased access to foreign markets. Indeed, adoption of the UN pressure receptacle standards should result in overall cost savings to those who choose to utilize them and will ease the regulatory compliance burden for shippers engaged in international commerce, including trans-border shipments in North America.

F. Paperwork Reduction Act

This proposed rule may result in a small increase in annual burden and costs based on a new information collection requirement. These proposals regarding the design, construction, maintenance and use of UN cylinders which result in a revised information collection requirement have been submitted to the Office of Management and Budget (OMB) for review and approval under OMB Control No. 2137–XXXX, ''Requirements for UN Cylinders.''

Under the Paperwork Reduction Act of 1995, no person is required to respond to an information collection unless it has been approved by OMB and displays a valid OMB control number. Section 1320.8(d), Title 5, Code of Federal Regulations requires that PHMSA provide interested members of the public and affected agencies an opportunity to comment on information collection and recordkeeping requests.

This notice identifies a revised information collection request that PHMSA will submit to OMB for approval based on the requirements in this proposed rule. PHMSA has developed burden estimates to reflect changes in this proposed rule. PHMSA estimates that the total information collection and recordkeeping burden for the current requirements and as proposed in this rule would be as follows:

OMB No. 2137–XXXX:

Total Annual Number of Respondents: 50.

Total Annual Responses: 150.

Total Annual Burden Hours: 900.

Total Annual Burden Cost: $22,500.00.

PHMSA specifically requests comments on the information collection and recordkeeping burdens associated with developing, implementing, and maintaining these requirements for approval under this proposed rule.

Direct your requests for a copy of the information collection to Deborah Boothe or T. Glenn Foster, Office of Hazardous Materials Standards (DHM–10), Research and Special Programs Administration, Room 8102, 400 Seventh Street, SW, Washington, DC 20590–0001, Telephone (202) 366–8553.

Address written comments to the Dockets Unit as identified in the **ADDRESSES** section of this rulemaking. We must receive your comments prior to the close of comment period identified in the **DATES** section of this rulemaking. In addition, you may submit comments specifically related to the information collection burden to the PHMSA Desk Officer, Office of Management and Budget at fax number, 202–395–6974. If these proposed requirements are adopted in a final rule, PHMSA will submit the revised information collection and recordkeeping requirements to the Office of Management and Budget for approval.

G. Unfunded Mandates Reform Act of 1995

This proposed rule would not impose unfunded mandates under the Unfunded Mandates Reform Act of 1995. It would not, if adopted, result in costs of $120.7 million or more, in the aggregate, to any of the following: State, local, or Native American tribal governments, or the private sector.

H. Regulation Identifier Number (RIN)

A regulation identifier number (RIN) is assigned to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. The RIN number contained in the heading of this document may be used to cross-reference this action with the Unified Agenda.

I. Environmental Assessment

The National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321–4347), requires Federal agencies to consider the consequences of major federal actions and prepare a detailed statement on actions significantly affecting the quality of the human environment. There are no significant environmental impacts associated with this proposed rule. PHMSA proposes changes to certain HMR requirements for the transportation of hazardous materials in cylinders in order to promote safer transportation practices, facilitate international commerce, and make these requirements compatible with international standards regarding such transportation.

J. Privacy Act

Anyone is able to search the electronic form for all comments received into any of our dockets by the name of the individual submitting the comments (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477–78) or you may visit *http://dms.dot.gov.*

List of Subjects

49 CFR Part 107

Administrative practice and procedure, Hazardous materials transportation, Packaging and containers, Penalties, Reporting and recordkeeping requirements.

49 CFR Part 171

Exports, Hazardous materials transportation, Hazardous waste, Imports, Incorporation by reference, Reporting and recordkeeping requirements.

49 CFR Part 172

Hazardous materials transportation, Hazardous waste, Labeling, Packaging and containers, Reporting and recordkeeping requirements.

49 CFR Part 173

Hazardous materials transportation, Incorporation by reference, Packaging and containers, Radioactive materials, Reporting and recordkeeping requirements, Uranium.

49 CFR Part 178

Hazardous materials transportation, Packaging and containers, Reporting and recordkeeping requirements.

49 CFR Part 180

Hazardous materials transportation, Incorporation by reference, Motor carriers, Motor vehicle safety, Packaging and containers, Reporting and recordkeeping requirements.

In consideration of the foregoing, we propose to amend 49 CFR Chapter I as follows:

PART 107—HAZARDOUS MATERIALS PROGRAM PROCEDURES

1. The authority citation for Part 107 continues to read as follows:

Authority: 49 U.S.C. 5101–5127, 44701; Pub. L. 101–410 section 4 (28 U.S.C. 2461 note); Pub. L. 104–121 sections 212–213; Pub. L. 104–134 section 31001; 49 CFR 1.45, 1.53.

2. Section 107.801(a) is revised to read as follows:

§ 107.801 Purpose and scope.

(a) This subpart prescribes procedures for—

(1) A person who seeks approval to be an independent inspection agency to perform production tests, inspections, verifications, and certifications of DOT specification cylinders or UN pressure receptacles as required by parts 178 and 180 of this chapter;

(2) A person who seeks approval to engage in the requalification (*e.g.* inspection, testing, or certification), rebuilding, or repair of a cylinder manufactured in accordance with a DOT specification or a pressure receptacle in accordance with a UN standard, under subchapter C of this chapter or under the terms of an exemption issued under this part;

(3) A person who seeks approval to perform the manufacturing chemical analyses and tests of DOT specification or exemption cylinders outside the United States, or UN pressure receptacles.

* * * * *

3. In § 107.803, the section heading is revised, paragraph (c)(8) is redesignated as paragraph (c)(9), and a new paragraph (c)(8) is added to read as follows:

§ 107.803 Approval of an independent inspection agency (IIA).

* * * * *

(c) * * *

(8) If the applicant's principal place of business is in a country other than the United States, the Associate Administrator may approve the applicant on the basis of an approval issued by the Competent Authority of the country of manufacture. The Competent Authority must maintain a current listing of approved IIAs and their identification marks. The applicant must provide the following information:

(i) A copy of the designation from the Competent Authority of that country delegating to the applicant an approval or designated agency authority for the type of packaging for which a DOT or UN designation is sought; and

(ii) Written evidence that the Competent Authority of that country provides reciprocal treatment to IIAs who are approved under this subpart and to UN standard packaging manufactured in accordance with this subchapter and that no condition or limitation will be imposed upon a United States citizen or organization that is not required of its own citizenry.

* * * * *

4. In § 107.805, the section heading and paragraphs (a), (c)(2), and (d) are revised to read as follows:

§ 107.805 Approval of cylinder and pressure receptacle requalifiers.

(a) *General.* A person must meet the requirements of this section to be approved to inspect, test, certify, repair, or rebuild a cylinder in accordance with a DOT specification or a UN pressure receptacle under subpart C of part 178 or subpart C of part 180 of this subchapter, or under the terms of an exemption issued under this part.

* * * * *

(c) * * *

(2) The types of DOT specification or exemption cylinders, or UN pressure receptacles that will be inspected, tested, repaired, or rebuilt at the facility;

* * * * *

(d) *Issuance of requalifier identification number (RIN).* The Associate Administrator issues a RIN as evidence of approval to requalify DOT specification or exemption cylinders, or UN pressure receptacles if it is determined, based on the applicant's submission and other available information, that the applicant's qualifications and, when applicable, facility are adequate to perform the requested functions in accordance with the criteria prescribed in subpart C of Part 180 of this subchapter.

* * * * *

PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

5. The authority citation for part 171 continues to read as follows:

Authority: 49 U.S.C. 5101–5127, 44701; 49 CFR 1.45 and 1.53; Pub. L. 101–410 section 4 (28 U.S.C. 2461 note); Pub L. 104–134 section 31001.

6. In § 171.7, in the table in paragraph (a)(3):

a. under General Services Administration, the entry Federal Specification RR–C–901 is revised; and

b. under *International Organization for Standardization,* the entry ISO 4126–1 is revised and 21 new entries are added to read in alphanumeric order as follows:

§ 171.7 Reference material.

(a) * * *

(3) *Table of material incorporated by reference.* * * *

Source and name of material	49 CFR reference
General Services Administration	
* * * * * * *	
Federal Specification RR–C–901D, Cylinders, Compressed Gas: Seamless Shatterproof, High Pressure DOT 3AA Steel, and 3AL Aluminum, February 21, 2003 (Superseding RR–C–901C, 1981).	173.302; 173.304; 173.336; 173.337.
International Organization for Standardization	
* * * * * * *	
ISO 1496–3 Series 1, Freight containers—Specification and testing—Part 3: Tank containers for liquids, gases and pressurized dry bulk 1995 (E).	178.74; 178.75.
ISO 3807–2, Cylinders for acetylene—Basic requirements—Part 2: Cylinders with fusible plugs, 2000 (E)	173.303; 178.71.
ISO 4126–1, Safety valves—Part 1: General requirements, December 15, 1991, First Edition (E)	178.75, 178.274.
ISO 6406, Periodic inspection and testing of seamless steel gas cylinders, 2004 (E)	180.207.
ISO 7225, Gas cylinders—Precautionary labels, 1994 (E)	178.71.
ISO 7866, Gas cylinders—Refillable seamless aluminum alloy gas cylinders—Design, construction and testing, 1999 (E)	178.71.
ISO 9809–1, Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 1: Quenched and tempered steel cylinders with tensile strength less than 1100 MPa., 1999 (E).	178.71; 178.75.
ISO 9809–2, Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1100 MPa., 2000 (E).	178.71; 178.75.
ISO 9809–3, Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 3: Normalized steel cylinders, 2000 (E).	178.71; 178.75.
ISO 10297, Gas cylinders—Refillable gas cylinder valves— Specification and type testing, 1999 (E)	173.301b.

Source and name of material	49 CFR reference
ISO 10461, Seamless aluminum—alloy gas cylinders—Periodic inspection and testing, 2004 (E)	180.205.
ISO 10462, Cylinders for dissolved acetylene—Periodic inspection and maintenance, 2004 (E)	180.205.
ISO 11114–1, Transportable gas cylinders—Compatibility of cylinder and valve materials with gas contents—Part 1: Metallic materials, 1997 (E).	173.301b; 178.71.
ISO 11114–2, Transportable gas cylinders—Compatibility of cylinder and valve materials with gas contents—Part 2: Non-metallic materials, 2000 (E).	173.301b; 178.71.
ISO 11117, Gas cylinders—Valve protection caps and valve guards for industrial and medical gas cylinders—Design, construction and tests, 1998 (E).	173.301b.
ISO 11118, Gas cylinders—Non-refillable metallic gas cylinders—Specification and test methods, 1999 (E)	178.71.
ISO 11119–1, Gas cylinders—Gas cylinders of composite construction—Specification and test methods—Part 1: Hoop-wrapped composite gas cylinders, 2002.	178.71.
ISO 11119–2, Gas cylinders—Gas cylinders of composite construction—Specification and test methods—Part 2: Fully wrapped fibre reinforced composite gas cylinders with load-sharing metal liners, 2002.	178.71
ISO 11119–3, Gas cylinders of composite construction—Specifications and test methods—Part 3: Fully wrapped fibre reinforced composite gas cylinders with non-metallic and non-load-sharing metal liners, 2002.	178.71.
ISO 11120, Gas cylinders—Refillable seamless steel tubes of water capacity between 150 L and 3000 L—Design, construction and testing, 1999 (E).	178.71; 178.75.
ISO 11621, Gas cylinders—Procedures for change of gas service, 1997 (E)	173.302.
ISO 11623, Transportable gas cylinders—Periodic inspection and testing of composite gas cylinders, 2002	180.207.
* * * * * * *	

7. In § 171.8, definitions for ''bundles of cylinders,'' ''multiple element gas containers or MEGCs,'' ''UN cylinder,'' ''UN pressure receptacle,'' ''UN tube'' and ''working pressure'' are added in alphabetical order to read as follows:

§ 171.8 Definitions.

* * * * *

Bundles of cylinders means assemblies of UN cylinders that are fastened together and interconnected by a manifold and transported as a unit. The total water capacity for the bundle may not exceed 3,000 L, except that bundles intended for the transport of gases in Division 2.3 are limited to a water capacity of 1,000 L.

* * * * *

Multiple-element gas containers or MEGCs means assemblies of UN cylinders, tubes, or bundles of cylinders interconnected by a manifold and assembled within a framework. The term includes all service equipment and structural equipment necessary for the transport of gases.

* * * * *

UN cylinder means a transportable pressure receptacle with a water capacity not exceeding 150 L that has been marked and certified as conforming to the applicable requirements in part 178 of this subchapter.

* * * * *

UN pressure receptacle means a UN cylinder or tube.

* * * * *

UN tube means a seamless transportable pressure receptacle with a water capacity exceeding 150 L but not more than 3,000 L that has been marked and certified as conforming to the requirements in part 178 of this subchapter.

* * * * *

Working pressure for purposes of UN pressure receptacles, means the settled pressure of a compressed gas at a reference temperature of 15 °C (59 °F).

* * * * *

8. In § 171.11, paragraph (d)(19) is added to read as follows:

§ 171.11 Use of ICAO Technical Instructions.

* * * * *

(d) * * *

(19) Cylinders transported to, from, or within the United States must conform to the applicable requirements of this subchapter. Unless otherwise excepted in this subchapter, a cylinder may not be transported unless—

(i) The cylinder is manufactured, inspected and tested in accordance with a DOT specification or a UN standard prescribed in part 178 of this subchapter, except that cylinders not conforming to these requirements must meet the requirements in § 173.301(j) through (k);

(ii) The cylinder is equipped with a pressure relief device in accordance with § 173.301(f) of this subchapter and conforms to the applicable requirements in part 173 for the hazardous material involved;

(v) For aluminum cylinders in oxygen service, except those used aboard an aircraft in accordance with the applicable airworthiness requirements and operating regulations, the opening is configured with straight (parallel) threads (UN cylinders are marked with the cylinder thread type, e.g. ''18P'' or ''18S''); and

(vi) A UN cylinder is marked with ''USA'' as a country of approval in conformance with §§ 178.69 and 178.70 of this subchapter.

9. In § 171.12, paragraph (b)(15) is revised to read as follows:

§ 171.12 Import and export shipments.

* * * * *

(b) * * *

(15) Cylinders transported to, from, or within the United States must conform to the applicable requirements of this subchapter. Unless otherwise excepted in this subchapter, a cylinder may not be transported unless—

(i) The cylinder is manufactured, inspected and tested in accordance with a DOT specification or a UN standard prescribed in part 178 of this subchapter, except that cylinders not conforming to these requirement must meet the requirements in § 173.301(j) through (k) of this subchapter;

(ii) The cylinder is equipped with a pressure relief device in accordance with § 173.301(f) of this subchapter and conforms to the applicable requirements in part 173 of this subchapter for the hazardous material involved;

(iii) For aluminum cylinders in oxygen service used for other than aircraft parts, the opening is configured with straight (parallel) threads (UN cylinders are marked with the cylinder thread marking, e.g. ''18P'' or ''18S''); and

(vi) A UN cylinder is marked with ''USA'' as a country of approval in conformance with §§ 178.69 and 178.70 of this subchapter.

* * * * *

10. In § 171.12a, paragraph (b)(13) is revised to read as follows:

§ 171.12a Canadian shipments and packagings

* * * * *

(b) * * *

(13) When the provisions of this subchapter require that a DOT specification or a UN standard packaging must be used for a hazardous material, a packaging authorized by the TDG Regulations may be used only if it corresponds to the DOT specification or UN standard authorized by this subchapter. Unless otherwise excepted in this subchapter, a cylinder may not be transported unless—

(i) The cylinder is manufactured, inspected and tested in accordance with a DOT specification or a UN standard prescribed in part 178 of this subchapter, except that cylinders not conforming to these requirements must meet the requirements in § 173.301(j) through (k) of this subchapter;

(ii) The cylinder is a UN cylinder marked with the letters ''CAN'' for Canada as country of manufacture or a country of approval;

(iii) The cylinder conforms to the applicable requirements in part 173 of this subchapter for the hazardous material involved; and

(v) For aluminum cylinders in oxygen service used for other than aircraft parts, the opening is configured with straight (parallel) threads (UN cylinders are marked with the cylinder thread type, e.g. ''18P'' or ''18S'').

* * * * *

PART 172—HAZARDOUS MATERIALS TABLE, SPECIAL PROVISIONS, HAZARDOUS MATERIALS COMMUNICATIONS, EMERGENCY RESPONSE INFORMATION, AND TRAINING REQUIREMENTS

11. The authority citation for Part 172 continues to read as follows:

Authority: 49 U.S.C. 5101–5127; 44701; 49 CFR 1.53.

12. In the § 172.101 Hazardous Materials Table, the following entries are revised to read as follows:

§ 172.101.—HAZARDOUS MATERIALS TABLE

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification numbers	PG	Label codes	Special provisions	(8) Packaging (§ 173.* * *)			(9) Quantity limitations		(10) Vessel stowage	
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	*	*	*		*	*		*	*	*			
	Acetylene, dissolved	2.1	UN1001		2.1	N88	None	303	None	Forbidden	15 kg	D	25, 40, 57
	*	*	*		*	*		*	*	*			
	Acetylene, solvent free	*Forbidden.*											
	*	*	*		*	*		*	*	*			
	Ammonia, anhydrous	2.3	UN1005		2.3, 8	4, N87, T50	None	304	314, 315	Forbidden	Forbidden	D	40, 57
	*	*	*		*	*		*	*	*			
I	Ammonia solution, relative density less than 0.880 at 15 degrees C in water, with more than 50 percent ammonia.	2.2	UN3318		2.3, 8	4, N87, T50	None	304	314, 315	Forbidden	Fobidden	D	40, 57
	*	*	*		*	*		*	*	*			
	Ammonia solution, relative density less than 0.880 at 15 degrees C in water, with more than 35 percent but not more than 50 percent ammonia.	2.2	UN2073		2.2	N87	306	304	314, 315	Forbidden	150 kg	E	40, 57
	Arsine	2.3	UN2188		2.3, 2.1	1, N89	None	192	245	Forbidden	Forbidden	D	40
	*	*	*		*	*		*	*	*			
	Bromine chloride	2.3	UN2901		2.3, 8, 5.1.	2, B9, B14, N86	None	304	314, 315	Forbidden	Forbidden	D	40, 89, 90
	*	*	*		*	*		*	*	*			
	Carbon monoxide and hydrogen mixture, compressed.	2.3	UN2600		2.3, 2.1	6, N89	None	302	302	Forbidden	Forbidden	D	40, 57
	*	*	*		*	*		*	*	*			
	Chlorine	2.3	UN1017		2.3, 8	2, B9, B14, N86, T50, TP19.	None	304	314, 315	Forbidden	Forbidden	D	40, 51, 55, 62, 68, 89, 90
	*	*	*		*	*		*	*	*			
	Chlorine pentafluoride	2.3	UN2548		2.3, 5.1, 8.	1, B7, B9, B14, N86.	None	304	314	Forbidden	Forbidden	D	40, 89, 90
	*	*	*		*	*		*	*	*			
	Chlorine trifluoride	2.3	UN1749		2.3, 5.1, 8.	2, B7, B9, B14, N86.	None	304	314	Forbidden	Forbidden	D	40, 89, 90
	*	*	*		*	*		*	*	*			
	Chloropicrin and methyl bromide mixtures.	2.3	UN1581		2.3	2, B9, B14, N86, T50.	None	193	314, 315	Forbidden	Forbidden	D	25, 40
	*	*	*		*	*		*	*	*			
	Chloropicrin and methyl chloride mixtures.	2.3	UN1582		2.3	2, N86, T50	None	193	245	Forbidden	Forbidden	D	25, 40
	*	*	*		*	*		*	*	*			
	Deuterium, compressed	2.1	UN1957		2.1	N89	306	302	None	Forbidden	150 kg	E	40

§ 172.101.—HAZARDOUS MATERIALS TABLE—Continued

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification numbers	PG	Label codes	Special provisions	(8) Packaging (§ 173.* * *)			(9) Quantity limitations		(10) Vessel stowage	
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	*	*	*	*	*	*	*	*	*	*			
	Diborane	2.3	UN1911		2.3, 2.1	1, N89	None	302	None	Forbidden	Forbidden	D	40, 57
	*	*	*	*	*	*	*	*	*	*			
	Dimethylamine, anhydrous	2.1	UN1032		2.1	N87, T50	None	304	314, 315	Forbidden	150 kg	D	40
	*	*	*	*	*	*	*	*	*	*			
	Ethyl chloride	2.1	UN1037		2.1	B77, N86, T50	None	322	314, 315	Forbidden	150 kg	B	40
	*	*	*	*	*	*	*	*	*	*			
	Ethylacetylene, stabilized	2.1	UN2452		2.1	N88	None	304	314, 315	Forbidden	150 kg	B	40
	*	*	*	*	*	*	*	*	*	*			
	Ethylamine	2.1	UN1036		2.1	B77, N87, T50	None	321	314, 315	Forbidden	150 kg	D	40
	*	*	*	*	*	*	*	*	*	*			
	Fertilizer ammoniating solution *with free ammonia*.	2.2	UN1043		2.2	N87	306	304	314, 315	Forbidden	150 kg	E	40
	*	*	*	*	*	*	*	*	*	*			
	Fluorine, compressed	2.3	UN1045		2.3, 5.1, 8.	1, N86	None	302	None	Forbidden	Forbidden	D	40, 89, 90
	*	*	*	*	*	*	*	*	*	*			
	Germane	2.3	UN2192		2.3, 2.1	2, N89	None	302	245	Forbidden	Forbidden	D	40
	*	*	*	*	*	*	*	*	*	*			
	Hydrogen and Methane mixtures, compressed.	2.1	UN2034		2.1	N89	306	302	302, 314, 315.	Forbidden	150 kg	E	40, 57
	*	*	*	*	*	*	*	*	*	*			
	Hydrogen bromide, anhydrous	2.3	UN1048		2.3, 8	3, B14, N86, N89.	None	304	314, 315	Forbidden	Forbidden	D	40
	*	*	*	*	*	*	*	*	*	*			
	Hydrogen chloride, anhydrous	2.3	UN1050		2.3, 8	3, N86, N89	None	304	None	Forbidden	Forbidden	D	40
	*	*	*	*	*	*	*	*	*	*			
	Hydrogen, compressed	2.1	UN1049		2.1	N89	306	302	302, 314	Forbidden	150 kg	E	40, 57
	*	*	*	*	*	*	*	*	*	*			
	Hydrogen fluoride, anhydrous	8	UN1052	I	8, 6.1	3, B7, B46, B71, B77, N86, T10, TP2.	None	163	243	Forbidden	Forbidden	D	40
	*	*	*	*	*	*	*	*	*	*			
	Hydrogen iodide, anhydrous	2.3	UN2197		2.3	3, B14, N89	None	304	314, 315	Forbidden	Forbidden	D	40
	*	*	*	*	*	*	*	*	*	*			
	Hydrogen sulfide	2.3	UN1053		2.3, 2.1	2, B9, B14, N89	None	304	314, 315	Forbidden	Forbidden	D	40
	*	*	*	*	*	*	*	*	*	*			
	Methyl acetylene and propadiene mixtures, stablized.	2.1	UN1060		2.1	N88, T50	306	304	314, 315	Forbidden	150 kg	B	40
	*	*	*	*	*	*	*	*	*	*			
	Menthyl bromide	2.3	UN1062		2.3	3, B14, N86, T50.	None	193	314, 315	Forbidden	Forbidden		40

*	*	*	*	*	*	*	*	*	*	*	*	
Methyl chloride *or* Refrigerant gas R 40.	2.1	UN1063	D	2.1	N86, T50	306	304	314, 315	5 kg	100 kg		40
*	*	*	*	*	*	*	*	*	*	*	*	
Methyl chloride and methylene chloride mixtures.	2.1	UN1912		2.1	N86, T50	306	304	314, 315	Forbidden	150 kg		40
*	*	*	*	*	*	*	*	*	*	*	*	
Methyl mercaptan	2.3	UN1064		2.3, 2.1	3, B7, B9, B14, N89, T50.	None	304	314, 315	Forbidden	Forbidden		40
*	*	*	*	*	*	*	*	*	*	*	*	
Methylamine, anhydrous	2.1	UN1061		2.1	N87, T50	306	304	314, 315	Forbidden	150 kg	B	40
*	*	*	*	*	*	*	*	*	*	*	*	
Oxygen difluoride, compressed	2.3	UN2190		2.3, 5.1, 8.	1, N86	None	304	None	Forbidden	Forbidden	D	13, 40, 89, 90
*	*	*	*	*	*	*	*	*	*	*	*	
Phosphine	2.3	UN2199		2.3, 2.1	N89	None	192	245	Forbidden	Forbidden	D	40
*	*	*	*	*	*	*	*	*	*	*	*	
Silane	2.1	UN2203		2.1	N89	None	302	None	Forbidden	Forbidden	E	40, 57, 104
*	*	*	*	*	*	*	*	*	*	*	*	
Trimethylamine, anhydrous	2.1	UN1083		2.1	N87, T50	306	304	314, 315	Forbidden	150 kg	B	40
*	*	*	*	*	*	*	*	*	*	*	*	
Tungsten hexafluoride	2.3	UN2196		2.3, 8	2, N86	None	338	None	Forbidden	Forbidden	D	40
*	*	*	*	*	*	*	*	*	*	*	*	
Vinyl bromide, stabilized	2.1	UN1085		2.1	N86, T50	306	304	314, 315	Forbidden	150 kg	B	40
*	*	*	*	*	*	*	*	*	*	*	*	
Vinyl chloride, stabilized	2.1	UN1086		2.1	21, B44, N86, T50.	306	304	314, 315	Forbidden	150 kg	B	40
Vinyl fluoride, stabilized	2.1	UN1086		2.1	N86	306	304	314, 315	Forbidden	150 kg	E	40
*	*	*	*	*	*	*	*	*	*	*	*	

13. In § 172.102(c)(5), Special Provisions ''N86'', ''N87'', ''N88'' and ''N89'' are added to read as follows:

§ 172.102 Special Provisions.

* * * * *

(c) * * *

(5) * * *

Code/Special Provisions

N86 UN pressure receptacles made of aluminum alloy are not authorized.

N87 The use of copper valves on UN pressure receptacles is prohibited.

N88 Metal parts of UN pressure receptacles in contact with the contents must contain no more than 65% copper.

N89 When steel UN pressure receptacles are used, only those bearing the ''H'' mark are authorized.

* * * * *

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

14. The authority citation for Part 173 continues to read as follows:

Authority: 49 U.S.C. 5101–5127, 44701; 49 CFR 1.45, 1.53.

15. In § 173.40, paragraphs (a)(1), (a)(2), and (b) are revised and paragraph (a)(3) is added to read as follows:

§ 173.40 General packaging requirements for toxic materials packaged in cylinders.

(a) * * *

(1) A cylinder must conform to a DOT specification or a UN standard prescribed in subpart C of part 178 of this subchapter, except that acetylene cylinders, and non-refillable cylinders are not authorized. A Hazard Zone A material is prohibited for transport in UN tubes or MEGCs.

(2) The use of a Specification 3AL cylinder made of aluminum alloy 6351-T6 is prohibited for a Division 2.3 Hazard Zone A material or a Division 6.1 Hazard Zone A material.

(3) A UN composite cylinder certified to ISO-11119-3 is not authorized for a Division 2.3 Hazard Zone A or B material.

* * * * *

(b) *Outage and pressure requirements.* The pressure at 55 °C (131 °F) of Hazard Zone A and Hazard Zone B materials may not exceed the service pressure of the cylinder. Sufficient outage must be provided so that the cylinder will not be liquid full at 55 °C (131 °F). For UN seamless cylinders used for Hazard Zone A or Hazard Zone B materials, the maximum water capacity is 85 L. Each UN cylinder must have a test pressure of 200 bar or greater, and a minimum wall thickness of 3.5 mm if made of aluminum alloy or 2 mm if made of steel. Alternatively, the UN cylinder may be packed in an outer packaging that meets the Packing Group I performance level when tested as prepared for transport, and that is designed and constructed to protect the cylinder and valve from puncture or damage that may result in release of the gas.

* * * * *

16. Section 173.163 is revised to read as follows:

§ 173.163 Hydrogen fluoride.

(a) Hydrogen fluoride (hydrofluoric acid, anhydrous) must be packaged as follows:

(1) In specification 3, 3A, 3AA, 3B, 3BN, or 3E cylinders; or in specification 4B, 4BA, or 4BW cylinders except that brazed 4B, 4BA, and 4BW cylinders are not authorized. The filling density may not exceed 85 percent of the cylinder's water weight capacity. In place of the periodic volumetric expansion test, cylinders used in exclusive service may be given a complete external visual inspection in conformance with part 180, subpart C, of this subchapter, at the time such requalification becomes due.

(2) In a UN cylinder, as specified in part 178 of this subchapter, having a minimum test pressure of 10 bar and a maximum filling ratio of 0.84.

(b) A cylinder removed from hydrogen fluoride service must be condemned in accordance with § 180.205 of this subchapter. Alternatively, at the direction of the owner, the requalifier may render the cylinder incapable of holding pressure.

17. In § 173.192, the introductory text and paragraph (a) introductory text are revised to read as follows:

§ 173.192 Packaging for certain toxic gases in Hazard Zone A.

When § 172.101 of this subchapter specifies a toxic material must be packaged under this section, only the following cylinders are authorized:

(a) Specification 3A1800, 3AA1800, 3AL1800, 3E1800, or seamless UN cylinders with a marked test pressure of 200 bar or greater.

* * * * *

18. In § 173.195, at the end of paragraph (a)(1), the wording ''or'' is removed and a period added in its place and paragraph (a)(3) is added to read as follows:

§ 173.195 Hydrogen cyanide, anhydrous, stabilized (hydrocyanic acid, aqueous solution).

(a) * * *

(3) UN cylinders, as specified in part 178, with a minimum test pressure of 100 bar and a maximum filling ratio of 0.55. The use of UN tubes and MEGCs is not authorized.

* * * * *

19. In § 173.201, the last entry in paragraph (c) is revised to read as follows:

§ 173.201 Non-bulk packagings for liquid hazardous materials in Packing Group I.

(c) * * *

Cylinders, specification or UN standard, as prescribed for any compressed gas, except 3HT and those prescribed for acetylene.

20. Section 173.205 is revised to read as follows:

§ 173.205 Specification cylinders for liquid hazardous materials.

When § 172.101 of this subchapter specifies that a hazardous material must be packaged under this section, the use of any specification or UN cylinder, except those specified for acetylene, is authorized. Cylinders used for toxic materials in Division 6.1 or 2.3 must conform to the requirements of § 173.40.

21. In § 173.226, paragraph (a) is revised to read as follows:

§ 173.226 Materials poisonous by inhalation, Division 6.1, Packing Group I, Hazard Zone A.

* * * * *

(a) In seamless specification or UN cylinders conforming to the requirements of § 173.40.

22. In § 173.227, paragraph (a) is revised to read as follows:

§ 173.227 Materials poisonous by inhalation, Division 6.1, Packing Group I, Hazard Zone B.

* * * * *

(a) In packagings as authorized in § 173.226 and seamless and welded specification cylinders or UN seamless cylinders conforming to the requirements of § 173.40.

23. In § 173.228, the introductory text is removed and paragraph (a) is revised to read as follows:

§ 173.228 Bromine pentafluoride or bromine trifluoride.

(a) Bromine pentafluoride and bromine trifluoride are authorized in packagings as follows:

(1) Specification 3A150, 3AA150, 3B240, 3BN150, 4B240, 4BA240, 4BW240, and 3E1800 cylinders.

(2) UN cylinders as specified in Part 178 of this subchapter, except acetylene cylinders and non-refillable cylinders, with a minimum test pressure of 10 bar and a minimum outage of 8 percent by volume. The use of UN tubes and MEGCs is not authorized.

(3) The use of a pressure relief device is not authorized.

* * * * *

24. In § 173.301, the section heading, the first sentence in paragraph (a)(1), the introductory text to paragraphs (a), (a)(1), (h), (h)(1), (i) and (l), and paragraphs (c), (d), (j), and (k) are revised and a new paragraph (a)(10) is added to read as follows:

§ 173.301 General requirements for shipment of compressed gases and other hazardous materials in cylinders, UN pressure receptacles and spherical pressure vessels.

(a) *General qualifications for use of cylinders.* Unless otherwise stated, as used in this section, the term ''cylinder'' includes a UN pressure receptacle. As used in this subpart, *filled* or *charged* means an introduction or presence of a hazardous material in a cylinder. A cylinder filled with a Class 2 hazardous material (gas) and offered for transportation must meet the requirements in this section and §§ 173.301a through 173.305, as applicable.

(1) Compressed gases must be in UN pressure receptacles built in accordance with the UN standards or in metal cylinders and containers built in accordance with the DOT and ICC specifications and Part 178 of this subchapter in effect at the time of manufacture, and requalified and marked as prescribed in subpart C in part 180 of this subchapter, if applicable. The DOT and ICC specifications authorized for use are as follows:

* * * * *

(10) A composite cylinder certified to ISO–11119–3 is subject to the following conditions:

(i) The cylinder must have a working pressure not to exceed 62 bar when used for Division 2.1 materials;

(ii) The cylinders may not be used for underwater breathing applications.

* * * * *

(c) *Toxic gases and mixtures.* Cylinders containing toxic gases and toxic gas mixtures meeting the criteria of Division 2.3 Hazard Zone A or B must conform to the requirements of § 173.40 and CGA Pamphlets S–1.1 and S–7 (IBR; see § 171.7 of this subchapter). A DOT 39 cylinder, UN non-refillable cylinder or UN composite cylinder certified to ISO–11119–3 may not be used for a toxic gas or toxic gas mixture meeting the criteria for Division 2.3, Hazard Zone A or B.

(d) *Gases capable of combining chemically.* A cylinder may not contain any gas or material capable of combining chemically with the cylinder's contents or with the cylinder's material construction, so as to endanger the cylinder's serviceability. DOT 3AL cylinders made of aluminum alloy 6351–T6 may not be filled and offered for transportation with pyrophoric gases. The use of UN cylinders made of aluminum alloy 6351–T6 is prohibited.

* * * * *

(h) *Cylinder valve protection.* UN pressure receptacles must meet the valve protection requirements in § 173.301b(f). A DOT specification cylinder used to transport a hazardous material must meet the requirements specified in this paragraph (h).

(1) The following specification cylinders are not subject to the cylinder valve protection requirements in this paragraph (h):

* * * * *

(i) *Cylinders mounted on motor vehicles or in frames.* MEGCs must conform to the requirements in § 173.312. DOT specification cylinders mounted on motor vehicles or in frames must conform to the requirements specified in this paragraph (i). Seamless DOT specification cylinders longer than 2 m (6.5 feet) are authorized for transportation only when horizontally mounted on a motor vehicle or in an ISO framework or other framework of equivalent structural integrity. Cylinders may not be transported by rail in container on freight car (COFC) or trailer on flat car (TOFC) service except under conditions approved by the Associate Administrator for Safety, Federal Railroad Administration. The cylinder must be configured as follows:

* * * * *

(j) *Non-specification cylinders in domestic use.* Except as provided in paragraph (k) and (l) of this section, a filled cylinder manufactured to other than a UN standard in accordance with Part 178 of this subchapter or DOT specification, other than a DOT exemption cylinder or a cylinder used as a fire extinguisher in conformance with § 173.309(a), may not be transported to, from, or within the United States.

(k) *Importation of foreign cylinders for discharge within a single port area.* A cylinder manufactured to other than a DOT specification or UN standard and certified as being in conformance with the transportation regulations of another country may be authorized, upon written request to and approval by the Associate Administrator, for transportation within a single port area, provided—

(1) The cylinder is transported in a closed freight container;

(2) The cylinder is certified by the importer to provide a level of safety at least equivalent to that required by the regulations in this subchapter for a comparable DOT specification or UN cylinder; and

(3) The cylinder is not refilled for export unless in compliance with paragraph (l) of this section.

(l) *Filling of foreign cylinders for export.* A cylinder not manufactured, inspected, tested and marked in accordance with part 178 of this subchapter, or a cylinder manufactured to other than a UN standard, DOT specification or exemption, may be filled with a gas in the United States and offered for transportation and transported for export, if the following conditions are met:

* * * * *

25. Section 173.301b is added to read as follows:

173.301b Additional general requirements for shipment of UN pressure receptacles.

(a) *General.* The requirements of this section are in addition to the requirements in § 173.301 and apply to the shipment of gases in UN pressure receptacles. A UN pressure receptacle, including closures, must conform to the design, construction, inspection and testing requirements specified in Parts 178 and 180 of this subchapter, as applicable. Bundles of cylinders must conform to the requirements in § 178.70(e) of this subchapter.

(b) *Compatibility of lading with packaging.* The gases or gas mixtures must be compatible with the UN pressure receptacle and valve materials as prescribed for metallic materials in ISO 11114–1 and for non-metallic materials in ISO 11114–2 (IBR, see § 171.7 of this subchapter).

(c) *Change of service.* A refillable UN pressure receptacle may not be filled with a gas or gas mixture different from that previously contained in the UN pressure receptacle unless the necessary operations for change of gas service have been performed in accordance with ISO 11621 (IBR, see § 171.7 of this subchapter).

(d) *Individual shut-off valves and pressure relief devices.* Except for Division 2.2 permanent gases, each UN pressure receptacle must be equipped with an individual shutoff valve that must be tightly closed while in transit. Each UN pressure receptacle must be individually equipped with a pressure relief device as prescribed by § 173.301(f), except that pressure relief devices on bundles of cylinders or manifolded horizontal cylinders must have a set-to-discharge pressure that is based on the lowest marked pressure of any cylinder in the bundle or manifolded unit.

(e) *Outer packaging.* When a strong outer packaging is prescribed, for example as provided by paragraph (a)(6) or (g)(1) of this section, the UN pressure receptacles must be protected to prevent movement. Unless otherwise specified in this part, more than one UN pressure receptacle may be enclosed in the strong outer packaging.

(f) *Cylinder valve protection.* A UN pressure receptacle must have its valves protected from damage that could cause inadvertent release of the contents of the UN pressure receptacle by one of the following methods:

(1) By constructing the pressure receptacle so that the valves are recessed inside the neck of the UN pressure receptacle and protected by a threaded plug or cap;

(2) By equipping the UN pressure receptacle with a valve cap conforming to the requirements in ISO 11117 (IBR, see § 171.7 of this subchapter). The cap must have vent-holes of sufficient cross-sectional area to evacuate the gas if leakage occurs at the valve;

(3) By protecting the valves by shrouds or guards conforming to the requirements in ISO 11117;

(4) By using valves designed and constructed to withstand damage without leakage of hazardous material. The valves must conform to the requirements in Annex B of ISO 10297 (IBR, see § 171.7 of this subchapter);

(5) By enclosing the UN pressure receptacles in frames, *e.g.,* bundles of cylinders; or

(6) By packing the UN pressure receptacles in a strong outer package, such as a box or crate, capable of meeting the drop test specified in § 178.603 of this subchapter at the Packing Group I performance level.

(g) *Non-refillable UN pressure receptacles.* Non-refillable UN pressure receptacles must conform to the following requirements:

(1) The receptacles must be transported as an inner package of a combination package;

(2) The receptacle must have a water capacity not exceeding 1.25 L when used for a flammable or toxic gas; and

(3) The receptacle is prohibited for Hazard Zone A material.

(h) *Damage to pressure receptacle.* A UN pressure receptacle may not be filled and offered for transportation when damaged to such an extent that the integrity of the UN pressure receptacle or its service equipment may be affected. Prior to filling, the service equipment must be examined and found to be in good working condition (see § 178.70(d) of this subchapter). In addition, the required markings must be legible on the pressure receptacle.

(i) *Pyrophoric gases.* A UN pressure receptacle must have valves equipped with gas-tight plugs or caps when used for pyrophoric or flammable mixtures of gases containing more than 1% pyrophoric compounds.

(j) *Hydrogen bearing gases.* Hydrogen bearing gases or other embrittling gases that have the potential of causing hydrogen embrittlement must be packaged in a steel UN pressure receptacle bearing an ''H'' mark.

26. In § 173.302, the introductory text to paragraph (a) and paragraph (b)(3) are revised to read as follows:

§ 173.302 Filling of cylinders with non-liquefied (permanent) compressed gases.

(a) *General requirements.* A cylinder filled with a non-liquefied compressed gas (except gas in solution) must be offered for transportation in accordance with the requirements of this section and § 173.301. In addition, a DOT specification cylinder must meet the requirements in §§ 173.301a, 173.302a and 173.305, as applicable. UN pressure receptacles must meet the requirements in §§ 173.301b and 173.302b, as applicable. Where more than one section applies to a cylinder, the most restrictive requirements must be followed.

* * * * *

(b) * * *

(3) Each UN pressure receptacle must be cleaned in accordance with the requirements of ISO 11621 (IBR, see § 171.7 or this subchapter). Each DOT cylinder must be cleaned in accordance with the requirements of GSA Federal Specification RR–C–901D, paragraphs 3.3.1 and 3.3.2 (IBR, see § 171.7 of this subchapter). Cleaning agents equivalent to those specified in Federal Specification RR–C–901D may be used provided they do not react with oxygen. One cylinder selected at random from a group of 200 or fewer and cleaned at the same time must be tested for oil contamination in accordance with Federal Specification RR–C–901D, paragraph 4.4.2.2, and meet the specified standard of cleanliness.

* * * * *

27. Section 173.302b is added to read as follows:

173.302b Additional requirements for shipment of non-liquefied (permanent) compressed gases in UN pressure receptacles.

(a) *General.* A cylinder filled with a non-liquefied gas must be offered for transportation in UN pressure receptacles subject to the requirements in this section and § 173.302. In addition, the requirements in §§ 173.301 and 173.301b must be met.

(b) *UN pressure receptacles filling limits.* A UN pressure receptacle is authorized for the transportation of non-liquefied compressed gases as specified in this section. Except where filling limits are specifically prescribed in this section, the working pressure of a UN pressure receptacle may not exceed ⅔ of the test pressure of the receptacle. Alternatively, the filling limits specified for non-liquefied gases in Table 1 of P200 of the UN Model Regulations (IBR, see § 171.7 or this subchapter) are authorized. In no case may the internal pressure at 65 °C (149 °F) exceed the test pressure.

(c) *Fluorine, compressed, UN 1045 and Oxygen diflouride, compressed, UN 2190.* Fluorine, compressed and Oxygen difluoride, compressed must be packaged in a UN pressure receptacle with a minimum test pressure of 200 bar and a maximum working pressure not to exceed 30 bar. A UN pressure receptacle made of aluminum alloy is not authorized. The maximum quantity of gas authorized in each UN pressure receptacle is 5 kg.

(d) *Diborane and diborane mixtures, UN 1911.* Diborane and diborane mixtures must be packaged in a UN pressure receptacle with a minimum test pressure of 250 bar and a maximum filling ratio dependent on the test pressure not to exceed 0.07. Filling should be further limited so that if complete decomposition of diborane occurs, the pressure of diborane or diborane mixtures will not exceed the working pressure of the cylinder. The use of UN tubes and MEGCs is not authorized.

(e) *Carbon monoxide, compressed UN 1016.* Carbon monoxide, compressed is authorized in UN pressure receptacles. The settled pressure in a steel pressure receptacle containing carbon monoxide may not exceed ⅓ of the pressure receptacle's test pressure at 65 °C (149 °F) except, if the gas is dry and sulfur-free, the settled pressure may not exceed ½ of the marked test pressure.

28. In § 173.303, paragraph (b) is revised and (f) is added to read as follows:

§ 173.303 Filling of cylinders with compressed gas in solution (acetylene).

* * * * *

(b) *Filling limits.* For DOT specification cylinders, the pressure in the cylinder containing acetylene gas may not exceed 250 psig at 70 °F. If cylinders are marked for a lower allowable charging pressure at 70 °F., that pressure must not be exceeded. For UN cylinders, the pressure in the cylinder may not exceed the limits specified in § 173.304b(b)(2).

(f) *UN cylinders.* (1) UN cylinders and bundles of cylinders are authorized for the transport of acetylene gas as specified in this section. Each UN acetylene cylinder must conform to ISO 3807–2 (IBR, see § 171.7 of this subchapter), have a homogeneous monolithic porous mass filler and be charged with acetone or a suitable solvent as specified in the standard. UN acetylene cylinders may be filled up to the pressure limits specified in ISO 3807–2 and must have a minimum test pressure of 52 bar. Any metal part in contact with the contents may not contain more than 65% copper in the alloy. The use of UN tubes and MEGCs is not authorized.

(2) UN cylinders equipped with pressure relief devices or that are manifolded together must be transported upright.

29. In § 173.304, the introductory text in paragraph (a) is revised to read as follows:

§ 173.304 Filling of cylinders with liquefied compressed gases.

(a) *General requirements.* A cylinder filled with a liquefied compressed gas (except gas in solution) must be offered for transportation in accordance with the requirements of this section and the general requirements in § 173.301. In addition, a DOT specification cylinder must meet the requirement in §§ 173.301a, 173.304a, and 173.305, as applicable. UN pressure receptacles must be shipped in accordance with the requirements in 173.301b and 173.304b, as applicable.

* * * * *

30. Section 173.304b is added to read as follows:

§ 173.304b Additional requirements for shipment of liquefied compressed gases in UN pressure receptacles.

(a) General. Liquefied gases must be offered for transportation in UN pressure receptacles subject to the requirements in this section and § 173.304. In addition, the general requirements applicable to UN pressure receptacles in §§ 173.301 and 173.301b must be met.

(b) *UN pressure receptacle filling limits.* A UN pressure receptacle is authorized for the transportation of liquefied compressed gases as specified in this section. When a liquefied compressed gas is transported in a UN pressure receptacle, the filling ratio may not exceed the maximum filling ratio (FR) prescribed in this section and the applicable ISO standard. Compliance with the filling limits may be determined by computing the filling limit in accordance with this section or by referencing the numerical values and data in Table 2 of P200 of the UN Model Regulations. The maximum allowable filling limits authorized for liquefied compressed gases in UN pressure receptacles are:

(1) For high pressure liquefied gases, in no case may the filling ratio of the settled pressure at 65 °C (149 °F) exceed the test pressure of the UN pressure receptacle.

(2) For low pressure liquefied gases, the filling factor (maximum mass of contents per liter of water capacity) must be less than or equal to 95 percent of the liquid phase at 50 °C. In addition, the UN pressure receptacle may not be liquid full at 60 °C. The test pressure of the pressure receptacle must equal to or greater than the vapor pressure of the liquid at 65 °C.

(3) For high pressure liquefied gas mixtures, maximum filling ratio may be determined as follows:

$$FR = 8.5\times10^{-4} \times d_g \times P_h$$

Where:

FR = maximum filling ratio
d_g = gas density (at 15 °C, 1 bar)(g/l)
P_h = minimum test pressure (bar)

If the density of the gas is unknown, the maximum filling ratio must be determined as follows:

$$FR = \frac{P_h \times MM \times 10^{-3}}{R \times 338}$$

Where:

FR = maximum filling ratio
P_h = minimum test pressure (bar)
MM = molecular mass (g/mol)
$R = 8.31451 \times 10^{-2}$ (bar.l/mol.K) gas constant

(4) For low pressure liquefied gases, the maximum filling ratio must be determined as follows:

$$FR = (0.0032 \times BP - 0.24) \times d_l$$

Where:

FR = maximum filling ratio
BP = boiling point (°K)
d_l = density of the liquid at boiling point (kg/l)

(c) *Tetraflouroethylene, stabilized, UN 1081* must be packaged in a pressure receptacle with a minimum test pressure of 200 bar and a working pressure not exceeding 5 bar.

(d) *Fertilizer ammoniating solution with free ammonia, UN1043* is not authorized in UN tubes or MEGCs.

31. Section 173.312 is added to read as follows:

§ 173.312 Requirements for shipment of MEGCs.

(a) *General requirements.* (1) Unless otherwise specified, a MEGC is authorized for the shipment of liquefied and non-liquefied compressed gases. Each pressure receptacle contained in a MEGC must meet the requirements in §§ 173.301, 173.301b, 173.302b and 173.304b, as applicable.

(2) The MEGC must conform to the design, construction, inspection and testing requirements prescribed in § 178.75 of this subchapter.

(3) No person may offer or accept a hazardous material for transportation in a MEGC that is damaged to such an extent that the integrity of the pressure receptacles or its structural or service equipment may be affected.

(4) No person may fill or offer for transportation a pressure receptacle in a MEGC if the pressure receptacle or the MEGC is due for periodic requalification, as prescribed in subpart C to Part 180 of this subchapter. However, this restriction does not preclude those pressure receptacles filled and offered for transportation prior to the requalification due date.

(5) Prior to filling and offering a MEGC for transportation, a person must visually inspect the MEGC's structural and service equipment. Any unsafe condition must be corrected before the MEGC is offered for transportation. All required markings must be legible.

(6) Except for Division 2.2 permanent gases, each pressure receptacle must be equipped with an individual shutoff valve that must be tightly closed while in transit. For Division 2.2 gases (permanent or liquefied) and 2.3 liquefied gases, the manifold must be designed so that each pressure receptacle can be filled separately and be kept isolated by a valve capable of being closed during transit. For Division 2.1 gases, the pressure receptacles must be isolated by a valve into assemblies of not more than 3,000 L.

(b) *Filling.* (1) A MEGC may not be filled to a pressure greater than the lowest marked working pressure of any pressure receptacle. A MEGC may not be filled above its marked maximum permissible gross mass.

(2) After each filling, the shipper must verify the leakproofness of the closures and equipment. Each fill opening must be closed by a cap or plug.

(c) *Damage protection.* During transportation, a MEGC must be protected against damage to the pressure receptacles and service equipment resulting from lateral and longitudinal impact and overturning as prescribed in § 178.75 of this subchapter.

32. In § 173.323, the first sentence in paragraph (b)(2) is revised to read as follows:

§ 173.323 Ethylene oxide.

* * * * *

(b) * * *

(2) In specification cylinders or UN pressure receptacles, as authorized for any compressed gas except acetylene.
* * *

* * * * *

33. In § 173.334, the introductory text to paragraph (a) is revised to read as follows:

§ 173.334 Organic phosphates mixed with compressed gas.

(a) Hexaethyl tetraphosphate, parathion, tetraethyl dithio pyrophosphate, tetraethyl pyrophosphate, or other Division 6.1 organic phosphates (including a compound or mixture), may be mixed with a non-flammable compressed gas. This mixture may not contain more than 20 percent by weight of an organic phosphate and must be packaged in DOT 3A240, 3AA240, 3B240, 4A240, 4B240, 4BA240, 4BW240 or UN cylinders meeting all of the following requirements:

* * * * *

34. Section 173.336 is revised to read as follows:

§ 173.336 Nitrogen dioxide, liquefied, or dinitrogen tetroxide, liquefied.

(a) Nitrogen dioxide, liquefied, or dinitrogen tetroxide, liquefied, must be packaged in specification or UN cylinders as prescribed in § 173.192, except valves are not authorized. UN tubes and MEGCs are not authorized for use. Each valve opening must be closed by a solid metal plug with tapered thread properly luted to prevent leakage.

(b) Transportation in DOT 3AL cylinders is authorized only by highway and rail. Each cylinder must be cleaned according to the requirements of GSA Federal Specification RR–C–901D, paragraphs 3.3.1 and 3.3.2 (IBR, see § 171.7 of this subchapter). Cleaning agents equivalent to those specified in RR–C–901D may be used; however, any cleaning agent must not be capable of reacting with oxygen. One cylinder selected at random from a group of 200 or fewer and cleaned at the same time must be tested for oil contamination in accordance with Specification RR–C–901D, paragraph 4.4.2.2 (IBR, see § 171.7 of this subchapter) and meet the standard of cleanliness specified therein.

35. In § 173.337, in paragraph (b) the wording ''RR–C–901C'' is revised to read ''RR–C–901D'' each place it appears, and the introductory paragraph is revised to read as follows:

§ 173.337 Nitric oxide.

(a) Nitric oxide must be packaged in cylinders conforming to the requirements of § 173.40 and as follows:

(1) *DOT specification cylinder.* In a DOT 3A1800, 3AA1800, 3E1800, or 3AL1800 cylinder. A DOT specification cylinder must be charged to a pressure of not more than 5,170 kPa (750 psi) at 21 °C (70 °F).

(2) *UN pressure receptacle.* In a UN pressure cylinder with a minimum test pressure of 200 bar and a maximum working pressure not exceeding 50 bar. A UN cylinder must be charged to a pressure of not more than 60 percent of the test pressure at 21 °C (70 °F) and the pressure in the cylinder at 65 °C (149 °F) may not exceed the test pressure. The use of UN tubes and MEGCs is not authorized.

(3) *Valves.* Cylinders must be equipped with a stainless steel valve and valve seat that will not deteriorate in contact with nitric oxide. Cylinders or valves may not be equipped with pressure relief devices of any type. In addition—

* * * * *

PART 178—SPECIFICATIONS FOR PACKAGINGS

The authority citation for part 178 continues to read as follows:

36. **Authority:** 49 U.S.C. 5101–5127; 49 CFR 1.53.

37. Section 178.69 is added to read as follows:

§ 178.69 Responsibilities and requirements for manufacturers of UN pressure receptacles.

(a) Each manufacturer of a UN pressure receptacle made in the United States must comply with the requirements in this section. The manufacturer must maintain a quality system, obtain an approval for each initial pressure receptacle design type, and ensure that all production of UN pressure receptacles meets the applicable requirements.

(1) *Quality system.* The manufacturer of a UN pressure receptacle must have its quality system approved by the Associate Administrator. The quality system will initially be assessed through an audit by the Associate Administrator or his or her representative to determine whether it meets the requirements of this section. The Associate Administrator will notify the manufacturer in writing of the results of the audit. The notification will contain the conclusions of the audit and any corrective action required. The Associate Administrator may perform periodic audits to ensure that the manufacturer operates in accordance with the quality system. Reports of periodic audits will be provided to the manufacturer. The manufacturer must bear the cost of audits.

(2) *Quality system documentation.* The manufacturer must be able to demonstrate a documented quality system. Management must review the adequacy of the quality system to assure that it is effective and conforms to the requirements in § 178.70. The quality system records must be in English and must include detailed descriptions of the following:

(i) The organizational structure and responsibilities of personnel with regard to design and product quality;

(ii) The design control and design verification techniques, processes, and procedures used when designing the pressure receptacles;

(iii) The relevant procedures for pressure receptacle manufacturing, quality control, quality assurance, and process operation instructions;

(iv) Inspection and testing methodologies, measuring and testing equipment, and calibration data;

(v) The process for meeting customer requirements;

(vi) The process for document control and document revision;

(vii) The system for controlling non-conforming material and records, including procedures for identification, segregation, and disposition;

(viii) Production, processing and fabrication, including purchased components, in-process and final materials; and

(ix) Training programs for relevant personnel.

(3) *Maintenance of quality system.* The manufacturer must maintain the quality system as approved by the Associate Administrator. Any changes to the quality system after approval must be approved by the Associate Administrator.

(b) *Design type approvals.* The manufacturer must have each pressure receptacle design type reviewed by an IIA and approved by the Associate Administrator in accordance with § 178.70. A cylinder is considered to be of a new design, compared with an existing approved design, as stated in the applicable ISO design, construction and testing standard.

(c) *Production inspection and certification.* The manufacturer must ensure that each UN pressure receptacle is inspected and certified in accordance with § 178.71.

38. Section 178.70 is added to read as follows:

§ 178.70 Approval of UN pressure receptacles.

(a) *Initial design-type approval.* The manufacturer of a UN pressure receptacle must obtain an initial design type approval from the Associate Administrator. The initial design type approval must be of the pressure receptacle design as it is intended to be produced. The manufacturer must arrange for an IIA, approved by the Associate Administrator in accordance with subpart I of Part 107 of this chapter, to perform a pre-audit of its pressure receptacle manufacturing operation prior to having an audit conducted by the Associate Administrator or his designee.

(b) *IIA pre-audit.* The manufacturer must submit an application for initial design type approval to the IIA for review. The IIA will examine the manufacturer's application for initial design type approval for completeness. An incomplete application will be returned to the manufacturer with an explanation. If an application is complete, the IIA will review all technical documentation, including drawings and calculations, to verify that the design meets all requirements of the applicable UN pressure receptacle standard and specification requirements. If the technical documentation shows that the pressure receptacle prototype design conforms to the applicable standards and requirements in § 178.70, the manufacturer will fabricate a prototype lot of pressure receptacles in conformance with the technical documentation representative of the design. The IIA will verify that the prototype lot conforms to the applicable requirements by selecting pressure receptacles and witness their testing. After prototype testing has been satisfactorily completed, showing the pressure receptacles fully conform to all applicable specification requirements, the certifying IIA must prepare a letter of recommendation and a design type approval certificate. The design type approval certificate must contain the name and address of the manufacturer and the IIA certifying the design type, the test results, chemical analyses, lot identification, and all other supporting data specified in the applicable ISO design, construction and testing standard. The IIA must provide the certificate and documentation to the manufacturer.

(c) *Application for initial design type approval.* If the pre-audit is found satisfactory by the IIA, the manufacturer will submit the letter of recommendation from the IIA and an application for design type approval to the Associate Administrator. An application for initial design type approval must be submitted for each manufacturing facility. The application must be in English and, at a minimum, contain the following information:

(1) The name and address of the manufacturing facility. If the application is submitted by an authorized representative on behalf of the manufacturer, the application must include the representative's name and address.

(2) The name and title of the individual responsible for the manufacturer's quality system, as required by § 178.69.

(3) The designation of the pressure receptacle and the relevant pressure receptacle standard.

(4) Details of any refusal of approval of a similar application by a designated approval agency of another country.

(5) The name and address of the production IIA that will perform the functions prescribed in paragraph (e) of this section. The IIA must be approved in writing by the Associate Administrator in accordance with subpart I of part 107 of this chapter.

(6) Documentation on the manufacturing facility as specified in § 178.69.

(7) Design specifications and manufacturing drawings, showing components and subassemblies if relevant, design calculations, and material specifications necessary to verify compliance with the applicable pressure receptacle design standard.

(8) Manufacturing procedures and any applicable standards that describe in detail the manufacturing processes and control.

(9) Design type approval test reports detailing the results of examinations and tests conducted in accordance with the relevant pressure receptacle standard.

(d) *Modification of approved pressure receptacles.* Modification of an approved UN pressure receptacle is not authorized without the approval of the Associate Administrator. An audit may be required as part of the process to modify an approval.

(e) *Responsibilities of the production IIA.* The production IIA is responsible for ensuring that each pressure receptacle conforms to the design type approval. The production IIA must perform the following functions:

(1) Witness all examinations and tests specified in the UN pressure receptacle standard to ensure compliance with the standard and that the procedures adopted by the manufacturer meet the requirements of the standard;

(2) Verify that the production inspections were performed in accordance with this section;

(3) Select UN pressure receptacles from a prototype production lot and witness testing as required for the design type approval;

(4) Ensure that the various type approval examinations and tests are performed accurately;

(5) Verify that each pressure receptacle is marked in accordance with the applicable requirements in § 178.72; and

(6) Furnish complete test reports to the manufacturer and upon request to the purchaser. The test reports and certificate of compliance must be retained by the IIA for at least 20 years from the original test date of the pressure receptacles.

(f) *Production inspection audit and certification.* (1) If the application, design drawing and quality control documents are found satisfactory, PHMSA will schedule an on-site audit of the pressure receptacle manufacturer's quality system, manufacturing processes, inspections, and test procedures.

(2) During the audit, the manufacturer will be required to produce pressure receptacles to the technical standards for which approval is sought.

(3) The production IIA must perform the required inspections and testing on the pressure receptacles during the production run. The IIA selected by the manufacturer for production inspection and testing may be different from the IIA who performed the design type approval testing.

(4) If the procedures and controls are deemed acceptable, test sample pressure receptacles will be selected at random from the production lot and sent to a laboratory designated by the Associate Administrator for verification testing.

(5) If the pressure receptacle test samples are found to conform to all the applicable requirements, the Associate Administrator will issue approvals to the manufacturer and the production IIA to authorize the manufacture of the pressure receptacles. The approved design type approval certificate will be returned to the manufacturer.

(6) Upon the receipt of the approved design type approval certificate from the Associate Administrator, the pressure receptacle manufacturer must sign the certificate.

(g) *Recordkeeping.* The production IIA and the manufacturer must retain a copy of the design type approval certificate and certificate of compliance records for at least 20 years.

(h) *Denial of design type application.* If the design type application is denied,

the Associate Administrator will notify the applicant in writing and provide the reason for the denial. The manufacturer may request that the Associate Administrator reconsider the decision. The application request must—

(1) Be written in English and filed within 60 days of receipt of the decision;

(2) State in detail any alleged errors of fact and law; and

(3) Enclose any additional information needed to support the request to reconsider.

(i) *Appeal.* (1) A manufacturer whose reconsideration request is denied may appeal to the PHMSA Administrator. The appeal must—

(i) Be written in English and filed within 60 days of receipt of the Associate Administrator's decision on reconsideration;

(ii) State in detail any alleged errors of fact and law;

(iii) Enclose any additional information needed to support the appeal; and

(iv) State in detail the modification of the final decision sought.

(2) The PHMSA Administrator will grant or deny the relief and inform the appellant in writing of the decision. PHMSA Administrator's decision is the final administrative action.

(j) *Termination of a design type approval certificate.* (1) The Associate Administrator may terminate an approval certificate issue under this section if it is determined that, because of a change in circumstances, the approval no longer is needed or no longer would be granted if applied for; information upon which the approval was based is fraudulent or substantially erroneous; or termination of the approval is necessary to adequately protect against risks to life and property.

(2) Before an approval is terminated, the Associate Administrator will provide the manufacturer and the approval agency—

(i) Written notice of the facts or conduct believed to warrant the withdrawal;

(ii) Opportunity to submit oral and written evidence, and

(iii) Opportunity to demonstrate or achieve compliance with the application requirement.

(3) If the Associate Administrator determines that a certificate of approval must be withdrawn to preclude a significant and imminent adverse affect on public safety, the procedures in paragraph (j)(2) (ii) and (iii) of this section need not be provided prior to withdrawal of the approval, but shall be provided as soon as practicable thereafter.

39. Section 178.71 is added to read as follows:

§ 178.71. Specifications for UN pressure receptacles.

(a) *General.* Each UN pressure receptacle must meet the requirements of this section. Requirements for approval, qualification, maintenance, and testing are contained in § 178.70, and subpart C of part 180 of this subchapter.

(b) *Definitions.* The following definitions apply for the purposes of design and construction of UN pressure receptacles under this subpart:

Alternative arrangement means an approval granted by the Associate Administrator for a MEGC that has been designed, constructed or tested to the technical requirements or testing methods other than those specified for UN pressure receptacles in Part 178 or Part 180 of this subchapter.

Bundles of cylinders. See § 171.8 of this subchapter.

Design type means a pressure receptacle design as specified by a particular pressure receptacle standard.

UN pressure receptacle design type means a UN pressure receptacle made to the same technical standards, of materials of the same specifications and thicknesses, manufactured by a single manufacturer at the same facility, using the same fabrication techniques and made with equivalent structural equipment, closures and service equipment.

UN tube. See § 171.8 of this subchapter.

(c) *General design and construction.* (1) UN pressure receptacles and their closures must be designed, manufactured, tested and equipped in accordance with the requirements contained in this section.

(2) The standard requirements applicable to UN pressure receptacles may be varied only if approved in writing by the Associate Administrator.

(3) The test pressure of UN cylinders, tubes, and bundles of cylinders must conform to the requirements in Part 178 of this subchapter.

(d) *Service equipment.* (1) Except for pressure relief devices, UN pressure receptacle equipment, including valves, piping, fittings, and other equipment subjected to pressure must be designed and constructed to withstand at least 1.5 times the test pressure of the pressure receptacle.

(2) Service equipment must be configured or designed to prevent damage that could result in the release of the pressure receptacle contents during normal conditions of handling and transport. Manifold piping leading to shut-off valves must be sufficiently flexible to protect the valves and the piping from shearing or releasing the pressure receptacle contents. The filling and discharge valves and any protective caps must be secured against unintended opening. The valves must be protected as specified in § 173.301b(f) of this subchapter.

(3) UN pressure receptacles that cannot be handled manually or rolled, must be equipped with devices (*e.g.* skids, rings, straps) ensuring that they can be safely handled by mechanical means and so arranged as not to impair the strength of, nor cause undue stresses, in the pressure receptacle.

(4) Pressure receptacles filled by volume must be equipped with a level indicator.

(e) *Bundles of cylinders.* UN pressure receptacles assembled in bundles must be structurally supported and held together as a unit and secured in a manner that prevents movement in relation to the structural assembly and movement that would result in the concentration of harmful local stresses. The frame design must ensure stability under normal operating conditions.

(1) The frame must securely retain all the components of the bundle and must protect them from damage during conditions normally incident to transportation. The method of cylinder restraint must prevent any vertical or horizontal movement or rotation of the cylinder that could cause undue strain on the manifold. The total assembly must be able to withstand rough handling, including being dropped or overturned.

(2) The frame must include features designed for the handling and transportation of the bundle. The lifting rings must be designed to withstand a design load of 2 times the maximum gross weight. Bundles with more than one lifting ring must be designed such that a minimum sling angle of 45 degrees to the horizontal can be achieved during lifting using the lifting rings. If four lifting rings are used, their design must be strong enough to allow the bundle to be lifted by two rings. Where two or four lifting rings are used, diametrically opposite lifting rings must be aligned with each other to allow for correct lifting using shackle pins. If the bundle is filled with forklift pockets, it must contain two forklift pockets on each side from which it is to be lifted. The forklift pockets must be positioned symmetrically consistent with the bundle center of gravity.

(3) The frame structural members must be designed for a vertical load of 2 times the maximum gross weight of the bundle. Design stress levels may not

exceed 0.9 times the yield strength of the material.

(4) The frame may not contain any protrusions from the exterior frame structure that could cause a hazardous condition.

(5) The frame design must prevent collection of water or other debris that would increase the tare weight of bundles filled by weight.

(6) The floor of the bundle frame must not buckle during normal operating conditions and must allow for the drainage of water and debris from around the base of the cylinders.

(7) If the frame design includes movable doors or covers, they must be capable of being secured with latches or other means that will not become dislodged by operational impact loads. Valves that need to be operated in normal service or in an emergency must be accessible.

(g) *Design and construction requirements for UN refillable seamless steel cylinders.* In addition to the general requirements of this section, UN refillable seamless steel cylinders must conform to the following ISO standards, as applicable:

(1) ISO 9809–1; Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 1: Quenched and tempered steel cylinders with tensile strength less than 1100 MPa. (IBR, see § 171.7 of this subchapter).

(2) ISO 9809–2; Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1100 MPa. (IBR, see § 171.7 of this subchapter).

(3) ISO 9809–3; Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 3: Normalized steel cylinders. (IBR, see § 171.7 of this subchapter).

(h) *Design and construction requirements for UN refillable seamless aluminum alloy cylinders.* In addition to the general requirements of this section, UN refillable seamless aluminum cylinders must conform to ISO 7866; Gas cylinders—Refillable seamless aluminum alloy gas cylinders—Design, construction and testing. (IBR, see § 171.7 of this subchapter). The use of Aluminum alloy 6351–T6 or equivalent is prohibited.

(i) *Design and construction requirements for UN non-refillable metal cylinders.* In addition to the general requirements of this section, UN non-refillable metal cylinders must conform to ISO 11118; Gas cylinders—Non-refillable metallic gas cylinders—Specification and test methods. (IBR, see § 171.7 of this subchapter).

(j) *Design and construction requirements for UN refillable seamless steel tubes.* In addition to the general requirements of this section, UN refillable seamless steel tubes must conform to ISO 11120; Gas cylinders—Refillable seamless steel tubes for compressed gas transport, of water capacity between 150 L and 3000 L—Design, construction and testing. (IBR, see § 171.7 of this subchapter).

(k) *Design and construction requirements for UN acetylene cylinders.* In addition to the general requirements of this section, UN acetylene cylinders must conform to the following ISO standards, as applicable:

(1) For the cylinder shell:

(i) ISO 9809–1; Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 1: Quenched and tempered steel cylinders with tensile strength less than 1100 MPa.

(ii) ISO 9809–3; Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 3: Normalized steel cylinders.

(2) The porous mass in an acetylene cylinder must conform to ISO 3807–2; Cylinders for acetylene—Basic requirements—Part 2: Cylinders with fusible plugs. (IBR, see § 171.7 of this subchapter).

(l) *Design and construction requirements for UN composite cylinders.* In addition to the general requirements of this section, UN composite cylinders must be designed for unlimited service life and conform to the following ISO standards, as applicable:

(1) ISO 11119–1; Gas cylinders of composite construction—Specification and test methods—Part 1: Hoop-wrapped composite gas cylinders. (IBR, see § 171.7 of this subchapter).

(2) ISO 11119–2; Gas cylinders of composite construction—Specification and test methods—Part 2: Fully-wrapped fibre reinforced composite gas cylinders with load-sharing metal liners. (IBR, see § 171.7 of this subchapter).

(3) ISO 11119–3; Gas cylinders of composite construction—Specification and test methods—Part 3: Fully wrapped fibre reinforced composite gas cylinders with non-metallic and non-load sharing metallic liners. (IBR, see § 171.7 of this subchapter). The design and construction of composite cylinders without liners are prohibited.

(m) *Material compatibility.* In addition to the material requirements specified in the UN pressure receptacle design and construction ISO standards, and any restrictions specified in Part 173 for the gases to be transported, the requirements of the following standards must be applied with respect to material compatibility:

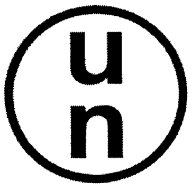
(1) ISO 11114–1; Transportable gas cylinders—Compatibility of cylinder and valve materials with gas contents—Part 1: Metallic materials. (IBR, see § 171.7 of this subchapter).

(2) ISO 11114–2; Transportable gas cylinders—Compatibility of cylinder and valve materials with gas contents—Part 2: Non-metallic materials. (IBR, see § 171.7 of this subchapter).

(n) *Protection of service equipment and closures.* Closures and their protection must conform to the requirements in § 173.301(f) of this subchapter.

(o) *Marking of UN refillable pressure receptacles.* UN refillable pressure receptacles must be marked clearly and legibly. The required markings must be permanently affixed by stamping, engraving, or other equivalent method, on the shoulder, top end or neck of the pressure receptacle or on a permanently affixed component of the pressure receptacle, such as a welded collar. Except for the ''UN'' mark, the minimum size of the marks must be 5 mm for pressure receptacles with a diameter greater than or equal to 140 mm and 2.5 mm for pressure receptacles with a diameter less than 140 mm. The minimum size of the ''UN'' mark must be 5 mm for pressure receptacles with a diameter less than 140 mm and 10 mm for pressure receptacles with a diameter of greater than or equal to 140 mm. The depth of the markings must not create harmful stress concentrations. A refillable pressure receptacle conforming to the UN standard must be marked as follows:

(1) The UN packaging symbol.



(2) The ISO standard, for example ISO 9809–1, used for design, construction and testing.

(3) The mark of the country where the approval is granted. The letters ''USA'' must be marked on UN pressure receptacles approved by the United States. The manufacturer must obtain an approval number from the Associate Administrator. The manufacturer approval number must follow the country of approval mark, separated by a slash (for example, USA/MXXXX). Pressure receptacles approved by more than one national authority may contain

the mark of each country of approval, separated by a comma.

(4) The identity mark or stamp of the IIA.

(5) The date of the initial inspection, the year (four digits) followed by the month (two digits) separated by a slash, for example ''2006/04''.

(6) The test pressure in bar, preceded by the letters ''PH'' and followed by the letters ''BAR''.

(7) The empty or tare weight. Except for acetylene cylinders, empty weight is the mass of the pressure receptacle in kilograms, including all integral parts (*e.g.*, collar, neck ring, foot ring, etc.), followed by the letters ''KG''. The empty weight does not include the mass of the valve, valve cap or valve guard or any coating. The empty weight must be expressed to three significant figures rounded up to the last digit. For cylinders of less than 1 kg, the empty weight must be expressed to two significant figures rounded down to the last digit. For acetylene cylinders, the tare weight must be marked on the cylinders in kilograms (KG). The tare weight is the sum of the empty weight, mass of the valve, any coating and all permanently attached parts (*e.g.* fittings and accessories) that are not removed during filling. The tare weight must be expressed to two significant figures rounded down to the last digit. The tare weight does not include the cylinder cap or any outlet cap or plug not permanently attached to the cylinder.

(8) The minimum wall thickness of the pressure receptacle in millimeters followed by the letters ''MM''. This mark is not required for pressure receptacles with a water capacity less than or equal to 1.0 L or for composite cylinders.

(9) For pressure receptacles intended for the transport of compressed gases and UN 1001 acetylene, dissolved, the working pressure in bar, preceded by the letters ''PW''.

(10) For liquefied gases, the water capacity in liters expressed to three significant digits rounded down to the last digit, followed by the letter ''L''. If the value of the minimum or nominal water capacity is an integer, the digits after the decimal point may be omitted.

(11) Identification of the cylinder thread type (*e.g.*, 25E).

(12) The country of manufacture. The letters ''USA'' must be marked on cylinders manufactured in the United States.

(13) The serial number assigned by the manufacturer.

(14) For steel pressure receptacles intended for the transport of gases with a risk of hydrogen embrittlement, the letter ''H'' showing compatibility of the steel, as specified in 1SO 11114–1.

(15) Identification of aluminum alloy, if applicable.

(16) Stamp for Nondestructive testing, if applicable.

(p) *Marking sequence.* The marking required by paragraph (o) must be placed in three groups as shown in the example below:

(i) The top grouping contains manufacturing marks and must appear consecutively in the sequence given in paragraphs (o)(11) through (16) of this section.

(ii) The middle grouping contains operational marks described in paragraphs (o)(11) through (15) of this section.

(iii) The bottom grouping contains certification marks and must appear consecutively in the sequence given in paragraph (o)(1) through (5) of this section.

(11)	(12)	(13)	(14)	(15)	(16)
25E	USA	765432	H		

(9)	(6)	(7)	(10)	(8)
PW200	PH300BAR	62.1KG	50L	5.8MM

(1)	(2)	(3)	(4)	(5)
	ISO 9809-1	USA/MXXXX	IB	2005/12

(q) *Other markings.* Other markings are allowed in areas other than the side wall, provided they are made in low stress areas and are not of a size and depth that will create harmful stress concentrations. Such marks must not conflict with required marks.

(r) *Marking of UN non-refillable pressure receptacles.* Unless otherwise specified in this paragraph, each UN non-refillable pressure receptacles must be clearly and legibly marked as prescribed in paragraph (o) of this section. In addition, permanent stenciling is authorized. Except when stenciled, the marks must be on the shoulder, top end or neck of the pressure receptacle or on a permanently affixed component of the pressure receptacle, for example a welded collar.

(1) The marking requirements and sequence listed in paragraphs (o)(1) through (16) of this section are required, except the markings in paragraphs (o)(7), (8), and (11) are not applicable. The required serial number marking in paragraph (o)(13) may be replaced by the batch number.

(2) Each receptacle must be marked with the words ''DO NOT REFILL'' in letters of at least 5 mm in height.

(3) A non-refillable pressure receptacle may, because of its size, substitute the marking required by this paragraph with a label. Reduction in marking size is authorized only as

prescribed in ISO 7225, Gas cylinders—Precautionary labels. (IBR, see § 171.7 of this subchapter).

(4) Each non-refillable pressure receptacle must also be legibly marked by stencilling the following statement: ''Federal law forbids transportation if refilled-penalty up to $500,000 fine and 5 years in imprisonment (49 U.S.C. 5124).''

(5) No person may mark a non-refillable pressure receptacle as meeting the requirements of this section unless it was manufactured in conformance with this section and the manufacturer has a current approval issued by the Associate Administrator.

40. Section 178.74 is added to read as follows:

§ 178.74 Approval of MEGCs.

(a) *Application for design type approval.* (1) Each new MEGC design type must have a design approval certificate. An owner or manufacturer must apply to an approval agency that is approved by the Associate Administrator in accordance with subpart E of part 107 of this chapter to obtain approval of a new design. When a series of MEGCs is manufactured without change in the design, the certificate is valid for the entire series. The design approval certificate must refer to the prototype test report, the materials of construction of the manifold, the standards to which the pressure receptacles are made and an approval number. The compliance requirements or test methods applicable to MEGCs as specified in this subpart may be varied when the level of safety is determined to be equivalent to or exceed the requirements of this subchapter and is approved in writing by the Associate Administrator. A design approval may serve for the approval of smaller MEGCs made of materials of the same type and thickness, by the same fabrication techniques and with identical supports, equivalent closures and other appurtenances.

(2) Each application for design approval must be in English and contain the following information:

(i) Two complete copies of all engineering drawings, calculations, and test data necessary to ensure that the design meets the relevant specification.

(ii) The manufacturer's serial number that will be assigned to each MEGC.

(iii) A statement as to whether the design type has been examined by any approval agency previously and judged unacceptable. Affirmative statements must be documented with the name of the approval agency, reason for nonacceptance, and the nature of modifications made to the design type.

(2) *Actions by the approval agency.* The approval agency must review the application for design type approval, including all drawings and calculations, to ensure that the design of the MEGC meets all requirements of the relevant specification and to determine whether it is complete and conforms to the requirements of this section. An incomplete application will be returned to the applicant with the reasons why the application was returned. If the application is complete and all applicable requirements of this section are met, the approval agency must prepare a MEGC design approval certificate containing the manufacturer's name and address, results and conclusions of the examination and necessary data for identification of the design type. If the Associate Administrator approves the Design Type Approval Certificate application, the approval agency and the manufacturer must each maintain a copy of the approved drawings, calculations, and test data for at least 20 years.

(b) *Approval agency's responsibilities.* The approval agency is responsible for ensuring that the MEGC conforms to the design type approval. The approval agency must:

(1) Witness all tests required for the approval of the MEGC specified in this section and § 178.75.

(2) Ensure, through appropriate inspection, that each MEGC is fabricated in all respects in conformance with the approved drawings, calculations, and test data.

(3) Determine and ensure that the MEGC is suitable for its intended use and that it conforms to the requirements of this subchapter.

(4) Apply its name, identifying mark or identifying number, and the date the approval was issued, to the metal identification marking plate attached to the MEGC upon successful completion of all requirements of this subpart. Any approvals by the Associate Administrator authorizing design or construction alternatives (Alternate Arrangements) of the MEGC (see paragraph (a) of this section) must be indicated on the metal identification plate as specified in § 178.75(j).

(5) Prepare an approval certificate for each MEGC or, in the case of a series of identical MEGCs manufactured to a single design type, for each series of MEGCs. The approval certificate must include all of the following information:

(i) The information displayed on the metal identification plate required by § 178.75(j);

(ii) The results of the applicable framework test specified in ISO 1496–3 (IBR, see § 171.7 of this subchapter);

(iii) The results of the initial inspection and test specified in paragraph (h) of this section;

(iv) The results of the impact test specified in § 178.75(i)(4);

(v) Certification documents verifying that the cylinders and tubes conform to the applicable standards; and

(vi) A statement that the approval agency certifies the MEGC in accordance with the procedures in this section and that the MEGC is suitable for its intended purpose and meets the requirements of this subchapter. When a series of MEGCs is manufactured without change in the design type, the certificate may be valid for the entire series of MEGCs representing a single design type. The approval number must consist of the distinguishing sign or mark of the country (''USA'' for the United States of America) where the approval was granted and a registration number.

(6) Retain on file a copy of each approval certificate for at least 20 years.

(c) *Manufacturers' responsibilities.* The manufacturer is responsible for compliance with the applicable specifications for the design and construction of MEGCs. The manufacturer of a MEGC must:

(1) Comply with all the requirements of the applicable ISO standard specified in § 178.71;

(2) Obtain and use an approval agency to review the design, construction and certification of the MEGC;

(3) Provide a statement in the manufacturers' data report certifying that each MEGC manufactured complies with the relevant specification and all the applicable requirements of this subchapter; and

(4) Retain records for the MEGCs for at least 20 years. When required by the specification, the manufacturer must provide copies of the records to the approval agency, the owner or lessee of the MEGC, and to a representative of DOT, upon request.

(d) *Denial of application for approval.* If the Associate Administrator finds that the MEGC will not be approved for any reason, the Associate Administrator will notify the applicant in writing and provide the reason for the denial. The manufacturer may request that the Associate Administrator reconsider the decision. The application request must—

(1) Be written in English and filed within 90 days of receipt of the decision;

(2) State in detail any alleged errors of fact and law; and

(3) Enclose any additional information needed to support the request to reconsider;

(e) *Appeal.* (1) A manufacturer whose reconsideration request is denied may appeal to the PHMSA Administrator. The appeal must—

(i) Be in writing and filed within 90 days of receipt of the Associate Administrator's decision on reconsideration;

(ii) State in detail any alleged errors of fact and law;

(iii) Enclose any additional information needed to support the appeal; and

(iv) State in detail the modification of the final decision sought.

(2) The Administrator will grant or deny the relief and inform the appellant in writing of the decision. The Administrator's decision is the final administrative action.

(f) *Modifications to approved MEGCs.* (1) Prior to modification of any approved MEGC that may affect conformance and safe use, and that may involve a change to the design type or affect its ability to retain the hazardous material in transportation, the MEGC's owner must inform the approval agency that prepared the initial approval certificate for the MEGC or, if the initial approval agency is unavailable, another approval agency, of the nature of the modification and request certification of the modification. The owner must supply the approval agency with all revised drawings, calculations, and test data relative to the intended modification. The MEGC's owner must also provide a statement as to whether the intended modification has been examined and determined to be unacceptable by any approval agency. The written statement must include the name of the approval agency, the reason for nonacceptance, and the nature of changes made to the modification since its original rejection.

(2) The approval agency must review the request for modification. If the approval agency determines that the proposed modification does not conform to the relevant specification, the approval agency must reject the request in accordance with paragraph (d) of this section. If the approval agency determined that the proposed modification conforms fully with the relevant specification, the request is accepted. If modification to an approved MEGC alters any information on the approval certificate, the approval agency must prepare a new approval certificate for the modified MEGC and submit the certificate to the Associate Administrator for approval. After receiving approval from the Associate Administrator, the approval agency must ensure that any necessary changes are made to the metal identification plate. A copy of each newly issued approval certificate must be retained by the approval agency and the MEGC's owner for at least 20 years. The approval agency must perform the following activities:

(i) Retain a set of the approved revised drawings, calculations, and data as specified in § 178.69(b)(4) for at least 20 years;

(ii) Ensure through appropriate inspection that all modifications conform to the revised drawings, calculations, and test data; and

(iii) Determine the extent to which retesting of the modified MEGC is necessary based on the nature of the proposed modification, and ensure that all required retests are satisfactorily performed.

(g) *Termination of Approval Certificate.* (1) The Associate Administrator may terminate an approval issued under this section if he or she determines that—

(i) Because of a change in circumstances, the approval no longer is needed or no longer would be granted if applied for;

(ii) Information upon which the approval was based is fraudulent or substantially erroneous;

(iii) Termination of the approval is necessary to adequately protect against risks to life and property; or

(iv) The MEGC does not meet the specification.

(2) Before an approval is terminated, the Associate Administrator will provide the person—

(i) Written notice of the facts or conduct believed to warrant the termination;

(ii) An opportunity to submit oral and written evidence; and

(3) An opportunity to demonstrate or achieve compliance with the applicable requirements.

(h) If the Associate Administrator determines that a certificate of approval must be terminated to preclude a significant and imminent adverse effect on public safety, the Associate Administrator may terminate the certificate immediately. In such circumstances, the opportunities of paragraphs (g)(2) and (3) of this section need not be provided prior to termination of the approval, but must be provided as soon as practicable thereafter.

41. Section 178.75 is added to read as follows:

§ 178.75 Specifications for MEGCs.

(a) *General.* Each MEGC must meet the requirements of this section. In a MEGC that meets the definition of a ''container'' within the terms of the International Convention for Safe Containers (CSC) must meet the requirements of the CSC as amended and 49 CFR parts 450 through 453, and must have a CSC approval plate.

(b) *Alternate Arrangements.* The technical requirements applicable to MEGCs may be varied when the level of safety is determined to be equivalent to or exceed the requirements of this subchapter. Such an alternate arrangement must be approved in writing by the Associate Administrator. MEGCs approved to an Alternate Arrangement must be marked as required by paragraph (j) of this section.

(c) *Definitions.* The following definitions apply:

Leakproofness test means a test using gas subjecting the pressure receptacles and the service equipment of the MEGC to an effective internal pressure of not less than 20% of the test pressure.

Manifold means an assembly of piping and valves connecting the filling and/or discharge openings of the pressure receptacles.

Maximum permissible gross mass or MPGM means the heaviest load authorized for transport (sum of the tare mass of the MEGC, service equipment and pressure receptacle).

Service equipment means manifold system (measuring instruments, piping and safety devices).

Shut-off valve means a valve that stops the flow of gas.

Structural equipment means the reinforcing, fastening, protective and stabilizing members external to the pressure receptacles.

(d) *General design and construction requirements.* (1) The MEGC must be capable of being loaded and discharged without the removal of its structural equipment. It must possess stabilizing members external to the pressure receptacles to provide structural integrity for handling and transport. MEGCs must be designed and constructed with supports to provide a secure base during transport and with lifting and tie-down attachments that are adequate for lifting the MEGC including when loaded to its maximum permissible gross mass. The MEGC must be designed to be loaded onto a transport vehicle or vessel and equipped with skids, mountings or accessories to facilitate mechanical handling.

(2) MEGCs must be designed, manufactured and equipped to withstand, without loss of contents, all normal handling and transportation conditions. The design must take into account the effects of dynamic loading and fatigue.

(3) Each pressure receptacle of a MEGC must be of the same design type, seamless steel, and constructed and tested according to one of the following ISO standards:

(i) ISO 9809–1; Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 1: Quenched and tempered steel cylinders with tensile strength less than 1100 MPa. (IBR, see § 171.7 of this subchapter);

(ii) ISO 9809–2; Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1100 MPa. (IBR, see § 171.7 of this subchapter);

(iii) ISO 9809–3; Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 3: Normalized steel cylinders. (IBR, see § 171.7 of this subchapter); or

(iv) ISO 11120; Gas cylinders-Refillable seamless steel tubes of water capacity between 150 L and 3000 L—Design, construction and testing. (IBR, see § 171.7 of this subchapter).

(4) Pressure receptacles of MEGCs, fittings, and pipework must be constructed of a material that is compatible with the hazardous materials intended to be transported, as specified in this subchapter.

(5) Contact between dissimilar metals that could result in damage by galvanic action must be prevented by appropriate means.

(6) The materials of the MEGC, including any devices, gaskets, and accessories, must have no adverse effect on the gases intended for transport in the MEGC.

(7) MEGCs must be designed to withstand, without loss of contents, at least the internal pressure due to the contents, and the static, dynamic and thermal loads during normal conditions of handling and transport. The design must take into account the effects of fatigue, caused by repeated application of these loads through the expected life of the MEGC.

(8) MEGCs and their fastenings must, under the maximum permissible load, be capable of withstanding the following separately applied static forces (for calculation purposes, acceleration due to gravity (g) = 9.81 m/s^2):

(i) In the direction of travel: 2g (twice the MPGM multiplied by the acceleration due to gravity);

(ii) Horizontally at right angles to the direction of travel: 1g (the MPGM multiplied by the acceleration due to gravity. When the direction of travel is not clearly determined, the forces must be equal to twice the MPGM);

(iii) Vertically upwards: 1g (the MPGM multiplied by the acceleration due to gravity); and

(iv) Vertically downwards: 2g (twice the MPGM (total loading including the effect of gravity) multiplied by the acceleration due to gravity.

(9) Under each of the forces specified in paragraph (d)(8) of this section, the stress at the most severely stressed point of the pressure receptacles must not exceed the values given in the applicable design specifications (*e.g.*, ISO 11120).

(10) Under each of the forces specified in paragraph (d)(8) of this section, the safety factor for the framework and fastenings must be as follows:

(i) For steels having a clearly defined yield point, a safety factor of 1.5 in relation to the guaranteed yield strength; or

(ii) For steels with no clearly defined yield point, a safety factor of 1.5 in relation to the guaranteed 0.2 percent proof strength and, for austenitic steels, the 1 percent proof strength.

(11) MEGCs must be capable of being electrically grounded to prevent electrostatic discharge when intended for flammable gases.

(12) The pressure receptacles of a MEGC must be secured in a manner to prevent movement that could result in damage to the structure and concentration of harmful localized stresses.

(e) *Service equipment.* (1) Service equipment must be arranged so that it is protected from mechanical damage by external forces during handling and transportation. When the connections between the frame and the pressure receptacles allow relative movement between the subassemblies, the equipment must be fastened to allow movement to prevent damage to any working part. The manifolds, discharge fittings (pipe sockets, shut-off devices), and shut-off valves must be protected from damage by external forces. Manifold piping leading to shut-off valves must be sufficiently flexible to protect the valves and the piping from shearing, or releasing the pressure receptacle contents. The filling and discharge devices, including flanges or threaded plugs, and any protective caps must be capable of being secured against unintended opening.

(2) Each pressure receptacle intended for the transport of Division 2.3 gases must be equipped with an individual shut-off valve. The manifold for Division 2.3 liquefied gases must be designed so that each pressure receptacle can be filled separately and be kept isolated by a valve capable of being closed during transit. For Division 2.1 gases, the pressure receptacles must be isolated by an individual shut-off valve into assemblies of not more than 3,000 L.

(3) For MEGC filling and discharge openings, two valves in series must be placed in an accessible position on each discharge and filling pipe. One of the valves may be a backflow prevention valve. The filling and discharge devices may be equipped to a manifold. For sections of piping which can be closed at both ends and where a liquid product can be trapped, a pressure-relief valve must be provided to prevent excessive pressure build-up. The main isolation valves on a MEGC must be clearly marked to indicate their directions of closure. Each shut-off valve or other means of closure must be designed and constructed to withstand a pressure equal to or greater than 1.5 times the test pressure of the MEGC. All shut-off valves with screwed spindles must close by a clockwise motion of the handwheel. For other shut-off valves, the open and closed positions and the direction of closure must be clearly shown. All shut-off valves must be designed and positioned to prevent unintentional opening. Ductile metals must be used in the construction of valves or accessories.

(4) The piping must be designed, constructed and installed to avoid damage due to expansion and contraction, mechanical shock and vibration. Joints in tubing must be brazed or have an equally strong metal union. The melting point of brazing materials must be no lower than 525 °C (977 °F). The rated pressure of the service equipment and of the manifold must be not less than two-thirds of the test pressure of the pressure receptacles.

(f) *Pressure relief devices.* Each pressure receptacle must be equipped with one or more pressure relief devices as specified in § 173.301(f) of this subchapter. When pressure relief devices are installed, each pressure receptacle or group of pressure receptacles of a MEGC that can be isolated must be equipped with one or more pressure relief devices. Pressure relief devices must be of a type that will resist dynamic forces including liquid surge and must be designed to prevent the entry of foreign matter, the leakage of gas and the development of any dangerous excess pressure.

(1) The size of the pressure relief devices: CGA S–1.1 (IBR, see § 171.7 of this subchapter) must be used to determine the relief capacity of individual pressure receptacles.

(2) Connections to pressure-relief devices: Connections to pressure relief devices must be of sufficient size to enable the required discharge to pass unrestricted to the pressure relief device. A shut-off valve installed between the pressure receptacle and the pressure relief device is prohibited, except where duplicate devices are provided for maintenance or other reasons, and the shut-off valves serving the devices actually in use are locked open, or the shut-off valves are interlocked so that at least one of the duplicate devices is always operable and capable of meeting the requirements of paragraph (f)(1) of this section. No obstruction is permitted in an opening leading to or leaving from a vent or pressure-relief device that might restrict or cut-off the flow from the pressure receptacle to that device. The opening through all piping and fittings must have at least the same flow area as the inlet of the pressure relief device to which it is connected. The nominal size of the discharge piping must be at least as large as that of the pressure relief device.

(3) Location of pressure-relief devices: For liquefied gases, each pressure relief device must, under maximum filling conditions, be in communication with the vapor space of the pressure receptacles. The devices, when installed, must be arranged to ensure the escaping vapor is discharged upwards and unrestrictedly to prevent impingement of escaping gas or liquid upon the MEGC, its pressure receptacles or personnel. For flammable, pyrophoric and oxidizing gases, the escaping gas must be directed away from the pressure receptacle in such a manner that it cannot impinge upon the other pressure receptacles. Heat resistant protective devices that deflect the flow of gas are permissible provided the required pressure relief device capacity is not reduced. Arrangements must be made to prevent access to the pressure relief devices by unauthorized persons and to protect the devices from damage caused by rollover.

(g) *Gauging devices.* When a MEGC is intended to be filled by mass, it must be equipped with one or more gauging devices. Glass level-gauges and gauges made of other fragile material are prohibited.

(h) *MEGC supports, frameworks, lifting and tie-down attachments.* (1) MEGCs must be designed and constructed with a support structure to provide a secure base during transport. MEGCs must be protected against damage to the pressure receptacles and service equipment resulting from lateral and longitudinal impact and overturning. The forces specified in paragraph (d)(8) of this section, and the safety factor specified in paragraph (d)(10) of this section must be considered in this aspect of the design. Skids, frameworks, cradles or other similar structures are acceptable. If the pressure receptacles and service equipment are so constructed as to withstand impact and overturning, additional protective support structure is not required (see paragraph (h)(4) of this section).

(2) The combined stresses caused by pressure receptacle mountings (*e.g.* cradles, frameworks, etc.) and MEGC lifting and tie-down attachments must not cause excessive stress in any pressure receptacle. Permanent lifting and tie-down attachments must be equipped to all MEGCs. Any welding of mountings or attachments onto the pressure receptacles is prohibited.

(3) The effects of environmental corrosion must be taken into account in the design of supports and frameworks.

(4) When MEGCs are not protected during transport as specified in paragraph (h)(1) of this section, the pressure receptacles and service equipment must be protected against damage resulting from lateral or longitudinal impact or overturning. External fittings must be protected against release of the pressure receptacles' contents upon impact or overturning of the MEGC on its fittings. Particular attention must be paid to the protection of the manifold. Examples of protection include:

(i) Protection against lateral impact, which may consist of longitudinal bars;

(ii) Protection against overturning, which may consist of reinforcement rings or bars fixed across the frame;

(iii) Protection against rear impact, which may consist of a bumper or frame;

(iv) Protection of the pressure receptacles and service equipment against damage from impact or overturning by use of an ISO frame according to the relevant provisions of ISO 1496–3.

(i) *Initial inspection and test.* The pressure receptacles and items of equipment of each MEGC must be inspected and tested before being put into service for the first time (initial inspection and test). This initial inspection and test of a MEGC must include the following:

(1) A check of the design characteristics.

(2) An external examination of the MEGC and its fittings, taking into account the hazardous materials to be transported.

(3) A pressure test performed at the test pressures specified in § 173.304b(b)(1) and (2) of this subchapter. The pressure test of the manifold may be performed as a hydraulic test or by using another liquid or gas. A leakproofness test and a test of the satisfactory operation of all service equipment must also be performed before the MEGC is placed into service. When the pressure receptacles and their fittings have been pressure-tested separately, they must be subjected to a leakproof test after assembly.

(4) A MEGC that meets the definition of ''container'' in the CSC (see 49 CFR 450.3(a)(2)) must be subjected to an impact test using a prototype representing each design type. The prototype MEGC must be shown to be capable of absorbing the forces resulting from an impact not less than 4 times (4g) the MPGM of the fully loaded MEGC, at a duration typical of the mechanical shocks experienced in rail transport. A listing of acceptable methods for performing the impact test is provided in the UN Model Regulations (IBR, see § 171.7 of this subchapter).

(j) *Marking.* (1) Each MEGC must be equipped with a corrosion resistant metal plate permanently attached to the MEGC in a conspicuous place readily accessible for inspection. The pressure receptacles must be marked according to this section. Affixing the metal plate to a pressure receptacle is prohibited. At a minimum, the following information must be marked on the plate by stamping or by any other equivalent method:

Country of manufacture
UN

Approval Country
Approval Number
Alternate Arrangements (see § 178.75(b))
MEGC Manufacturer's name or mark
MEGC's serial number
Approval agency (Authorized body for the design approval)
Year of manufacture
Test pressure: _____ bar gauge
Design temperature range _____ °C to _____ °C
Number of pressure receptacles _____
Total water capacity _____ liters
Initial pressure test date and identification of the Approval Agency
Date and type of most recent periodic tests
Year _____ Month _____ Type _____
(*e.g.* 2004–05, AE/UE, where ''AE''

represents acoustic emission and ''UE'' represents ultrasonic examination)
Stamp of the approval agency who performed or witnessed the most recent test

(2) The following information must be marked on a metal plate firmly secured to the MEGC:

Name of the operator
Maximum permissible load mass _____ kg
Working pressure at 15°C: _____ bar gauge
Maximum permissible gross mass (MPGM) _____ kg
Unladen (tare) mass _____ kg

PART 180—CONTINUING QUALIFICATION AND MAINTENANCE OF PACKAGINGS

42. The authority citation for part 180 continues to read as follows:

Authority: 49 U.S.C. 5101–5127; 49 CFR 1.53.

43. Section 180.201 is revised to read as follows:

§ 180.201 Applicability.

This subpart prescribes requirements, in addition to those contained in parts 107, 171, 172, 173, and 178 of this chapter, for the continuing qualification, maintenance, or periodic requalification of DOT specification and exemption cylinders and UN pressure receptacles.

44. In § 180.203, the introductory paragraph is revised to read as follows:

§ 180.203 Definitions.

As used in this section, the word ''cylinder'' includes UN pressure receptacles. In addition to the definitions contained in § 171.8 of this subchapter, the following definitions apply to this subpart:

* * * * *

§ 180.205 [Amended]

45. In § 180.205, the section heading is revised to read: ''General requirements for requalification of specification cylinders.''

46. Section 180.207 is added to read as follows:

§ 180.207 Requirements for requalification of UN pressure receptacles.

(a) *General.* (1) Each UN pressure receptacle used for the transportation of hazardous materials must conform to the requirements prescribed in paragraphs (a), (b) and (d) in § 180.205.

(2) No pressure receptacle due for requalification may be filled with a hazardous material and offered for transportation in commerce unless that cylinder has been successfully requalified and marked in accordance with this subpart. A cylinder may be requalified at any time during or before the month and year that the requalification is due. However, a cylinder filled before the requalification becomes due may remain in service until it is emptied.

(3) A cylinder with a specified service life may not be refilled and offered for transportation after its authorized service life has expired. No person may requalify a UN composite pressure receptacle for continued use beyond its 15-years authorized service life unless approval has been obtained in writing from the Associate Administrator.

(b) *Periodic requalification of UN pressure receptacles.* (1) Each cylinder that is successfully requalified in accordance with the requirements specified in this section must be marked in accordance with § 180.213. The requalification results must be recorded in accordance with § 180.215.

(2) Each cylinder that fails requalification must be rejected or condemned in accordance with the applicable ISO requalification standard.

(c) *Requalification interval.* Each UN pressure receptacle that becomes due for periodic requalification must be requalified at the interval specified in the following table:

TABLE 1.—REQUALIFICATION INTERVALS OF UN PRESSURE RECEPTACLES

Interval (years)	UN pressure receptacles/hazardous materials
10	Pressure receptacles for all hazardous materials except as noted below (also for dissolved acetylene, see paragraph (c)(3) of this section):
5	Composite cylinders. All Division 2.3 materials. UN1013, Carbon dioxide. UN1043, Fertilizer ammoniating solution with free ammonia. UN1051, Hydrogen cyanide, stabilized *containing less than 3% water.* UN1052, Hydrogen fluoride, anhydrous. UN1745, Bromine pentafluoride. UN1746, Bromine trifluoride. UN2073, Ammonia solution. UN2495, Iodine pentafluoride. UN2983, Ethylene Oxide and Propylene oxide mixture, *not more than 30% ethylene oxide.*

(d) *Requalification procedures.* Each UN pressure receptacle that becomes due for requalification must be requalified at the interval prescribed in paragraph (b) of this section and in accordance with the procedures contained in the following standard, as applicable. When a pressure test is performed on a UN pressure receptacle, the test must be a water jacket volumetric expansion test suitable for the determination of the cylinder expansion. An alternative method (*e.g.* proof pressure test) may not be performed unless prior approval has been obtained in writing from the Associate Administrator. The test equipment must be calibrated daily in accordance with § 180.205(g).

(1) Seamless steel: Each seamless steel UN pressure receptacle, including MEGC's pressure receptacles, must be requalified in accordance with ISO 6406 (IBR; see § 171.7 of this subchapter), except that UN pressure receptacles made of high strength steel with tensile strength equal to or greater than 950 MPa and UN tubes must be requalified as specified in § 180.209 or in accordance with requalification procedures approved by the Associate Administrator.

(2) Seamless UN aluminum: Each seamless aluminum UN pressure receptacle must be requalified in accordance with ISO 10461 (IBR; see § 171.7 of this subchapter).

(3) Dissolved acetylene UN cylinders: Each dissolved acetylene cylinder must be requalified in accordance with ISO 10462 (IBR; see § 171.7 of this subchapter). The porous mass and the shell must be requalified no sooner than 3 years, ± 6 months, from the date of manufacture. Thereafter, subsequent

requalifications of the porous mass and shell must be performed at least once every ten years.

(4) Composite UN cylinders: Each composite cylinder must be inspected and tested in accordance with ISO 11623 (IBR; see § 171.7 of this subchapter).

47. Section 180.212 is added to read as follows:

§ 180.212 Repair of seamless DOT 3-series specification cylinders and seamless UN pressure receptacles.

(a) *General requirements for repair of DOT 3-series cylinders and UN pressure receptacles.* (1) No person may repair a DOT 3-series cylinder or a seamless UN pressure receptacle unless—

(i) The repair facility holds an approval issued under the provisions in § 107.805 of this subchapter; and

(ii) Except as provided in paragraph (b) of this section, the repair and the inspection is performed under the provisions of an approval issued under subpart H of Part 107 of this subchapter and conform to the applicable cylinder specification or ISO standard contained in part 178 of this subchapter.

(2) The person performing the repair must prepare a report containing, at a minimum, the results prescribed in § 180.215.

(b) *Repairs not requiring prior approval.* Approval is not required for the following specific repairs:

(1) The removal and replacement of a neck ring or foot ring on a DOT 3A, 3AA or 3B cylinder or a UN pressure receptacle that does not affect a pressure part of the cylinder when the repair is performed by a repair facility or a cylinder manufacturer of these types of cylinders. The repair may be made by welding or brazing in conformance with the original specification. After removal and before replacement, the cylinder must be visually inspected and any defective cylinder must be rejected. The heat treatment, testing and inspection of the repair must be performed under the supervision of an inspector and must be performed in accordance with the original specification.

(2) External re-threading of DOT 3AX, 3AAX or 3T specification cylinders or a UN pressure receptacle mounted in a MEGC; or the internal re-threading of a DOT–3 series cylinder or a seamless UN pressure receptacle when performed by the original manufacturer of the cylinder. The repair work must be performed under the supervision of an independent inspection agency. Upon completion of the re-threading, the threads must be gauged in accordance with Federal Standard H–28 or an equivalent standard containing the same specification limits. The re-threaded cylinder must be stamped clearly and legibly with the words ''RETHREAD'' on the shoulder, top head, or neck. No DOT specification cylinder or UN cylinder may be re-threaded more than one time without approval of the Associate Administrator.

48. In § 180.213, paragraphs (a), (f)(1), and (f)(7) are revised, and paragraph (c)(3) and (f)(8) are added, to read as follows:

§ 180.213 Requalification markings.

(a) *General.* Each cylinder (including UN pressure receptacles) requalified in accordance with this subpart with acceptable results must be marked as specified in this section. Required specification markings may not be altered or removed.

* * * * *

(c) * * *

(3) For a composite cylinder, the requalification markings must be applied on a pressure sensitive label, securely affixed and overcoated with epoxy near the original manufacturer's label. Stamping of the composite surface is not authorized.

* * * * *

(f) * * *

(1) For designation of the 5-year volumetric expansion test, 10-year volumetric expansion test for UN cylinders and cylinders conforming to § 180.209(f) and (h), or 12-year volumetric expansion test for fire extinguishers conforming to § 173.309(b) of this subchapter and cylinders conforming to §§ 180.209(e) and 178.209(g), the marking is as illustrated in paragraph (d) of this section.

* * * * *

(7) For designation of DOT 8 series and UN cylinder shell and porous filler requalification, the marking is as illustrated in paragraph (d) of this section, except that the ''X'' is replaced with the letters ''FS''.

(8) For designation of a nondestructive test combined with a visual inspection, the marking is as illustrated in paragraph (d) of this section, except that the ''X'' is replaced with the letters ''AE'' for acoustic emission and ''UE'' for ultrasonic examination.

49. Section 180.217 is added to read as follows:

§ 180.217 Requalification requirements for MEGCs.

(a) *Periodic inspections.* Each MEGC must be given an initial visual inspection and test in accordance with § 178.75(i) of this subchapter before being put into service for the first time. After the initial inspection, a MEGC must be inspected at least once every five years.

(1) The 5-year periodic inspection must include an external examination of the structure, the pressure receptacles and the service equipment, as follows:

(i) The pressure receptacles are inspected externally for pitting, corrosion, abrasions, dents, distortions, defects in welds or any other conditions, including leakage, that might render the MEGC unsafe for transport.

(ii) The piping, valves, and gaskets are inspected for corroded areas, defects, and other conditions, including leakage, that might render the MEGC unsafe for filling, discharge or transport.

(iii) Missing or loose bolts or nuts on any flanged connection or blank flange are replaced or tightened.

(iv) All emergency devices and valves are free from corrosion, distortion and any damage or defect that could prevent their normal operation. Remote closure devices and self-closing stop-valves must be operated to demonstrate proper operation.

(v) Required markings on the MEGC are legible in accordance with the applicable requirements.

(vi) The framework, the supports and the arrangements for lifting the MEGC are in satisfactory condition.

(2) The MEGC's pressure receptacles and piping must be periodically requalified as prescribed in § 180.207(c), at the interval specified in Table 1 in § 180.207.

(b) *Exceptional inspection and test.* If a MEGC shows evidence of damaged or corroded areas, leakage, or other conditions that indicate a deficiency that could affect the integrity of the MEGC, an exceptional inspection and test must be performed, regardless of the last periodic inspection and test. The extent of the exceptional inspection and test will depend on the amount of damage or deterioration of the MEGC. As a minimum, an exceptional inspection of a MEGC must include inspection as specified in paragraph (a)(1) of this section.

(c) *Correction of unsafe condition.* When evidence of any unsafe condition is discovered, the MEGC may not be returned to service until the unsafe condition has been corrected and the MEGC has been requalified in accordance with the applicable tests and inspection.

(d) *Repairs and modifications to MEGCs.* No person may perform a modification to an approved MEGC that may affect conformance to the applicable ISO standard or safe use, and that involve a change to the design type

or affect its ability to retain the hazardous material in transportation. Before making any modification changes to an approved MEGC, the owner must obtain approval from the Associate Administrator as prescribed in § 178.74 of this subchapter. The repair of a MEGC's structural equipment is authorized provided such repairs are made in accordance with the requirements prescribed for its approved design and construction. Any repair to the pressure receptacles of a MEGC must meet the requirements of § 180.212.

(e) *Requalification markings.* Each MEGC must be durably and legibly marked in English, with the year and month, and the type of the most recent periodic requalification performed (*e.g.*, 2004–05 AE/UE, where ''AE'' represents acoustic emission and ''UE'' represents ultrasonic examination) followed by the stamp of the approval agency who performed or witnessed the most recent test.

(f) *Records.* The owner of each MEGC or the owner's authorized agent must retain a written record of the date and results of all repairs and required inspections and tests. The report must contain the name and address of the person performing the inspection or test. The periodic test and inspection records must be retained until the next inspection or test is completed. Repair records and the initial exceptional inspection and test records must be retained during the period the MEGC is in service and for one year thereafter. These records must be made available for inspection by a representative of the Department on request.

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Frits Wybenga,

Deputy Associate Administrator for Hazardous Materials Safety.

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