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DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

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

[Docket No. PHMSA-2020-0102 (HM-219D)]

RIN 2137-AF49

Hazardous Materials: Adoption of Miscellaneous Petitions and Updating Regulatory Requirements

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

ACTION: Final rule.

SUMMARY: PHMSA amends the Hazardous Materials Regulations (HMR) to update, clarify, improve the safety of, or streamline various regulatory requirements. Specifically, this rulemaking responds to 18 petitions for rulemaking submitted by the regulated community between May 2018 and October 2020 that requests PHMSA address a variety of provisions, including but not limited to those addressing packaging, hazard communication, and the incorporation by reference of certain documents. These revisions maintain or enhance the existing high level of safety under the HMR while providing clarity and appropriate regulatory flexibility in the transport of hazardous materials.

DATES: *Effective date:* This final rule is effective on **[INSERT DATE 30 DAYS FROM DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

Delayed compliance date: March 4, 2025.

Incorporation by reference date: The incorporation by reference of certain publications listed in this final rule is approved by the Director of the *Federal Register* as of **[INSERT DATE 30 DAYS FROM DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

FOR FURTHER INFORMATION CONTACT: Steven Andrews, 202-366-8553, Office of Hazardous Materials Standards, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, East Building, 2nd Floor, Washington, D.C. 20590-0001.

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I. Background

The Administrative Procedure Act (APA) requires Federal agencies to give interested persons the right to petition an agency to issue, amend, or repeal a rule. (*See* 5 U.S.C. 553(e).) PHMSA regulations specify that persons petitioning PHMSA to add, revise, or remove a regulation in the Hazardous Materials Regulations (HMR; 49 CFR parts 171 through 180) must file a petition for rulemaking containing adequate support for the requested action. (*See* 49 CFR 106.100.) PHMSA amends the HMR in response to petitions for rulemaking submitted by shippers, carriers, manufacturers, and industry representatives, and welcomes petitions from any interested stakeholder or member of the public with suggested changes to improve the HMR.

PHMSA now finds that these revisions will maintain the high safety standard currently achieved under the HMR while providing clarity and appropriate regulatory flexibility in the transport of hazardous materials. PHMSA also notes that—insofar as adoption of the petitions could reduce delays and interruptions of hazardous materials shipments during transportation—the amendments will also lower greenhouse gas (GHG) emissions and safety risks to minority, low-income, underserved, and other disadvantaged populations and communities in the vicinity of interim storage sites and transportation arteries and hubs. A detailed discussion of the petitions and revisions can be found in section III of this final rule.

In this final rule, PHMSA revises the HMR to:

- Allow for appropriate flexibility of packaging options in the transportation of compressed natural gas in cylinders.
- Streamline the approval application process for the repair of certain DOT specification cylinders.
- Provide greater clarity on the filling requirements for certain cylinders used to transport hydrogen and hydrogen mixtures.
- Facilitate international commerce, and streamline packaging and hazard communication requirements by harmonizing the HMR with international regulations to allow the shipment of de minimis amounts of poisonous materials.
- Provide greater clarity by requiring a specific marking on cylinders to indicate compliance with certain HMR provisions.
- Streamline hazard communication requirements by allowing appropriate marking exceptions under certain conditions for the transportation of lithium button cell batteries installed in equipment.
- Provide greater flexibility and accuracy in hazard communication by allowing additional descriptions for certain gas mixtures.

- Increase the safe transportation of explosives by updating certain Institute of Makers of Explosives (IME) documents currently incorporated by reference.
- Modify the definition of “liquid” to include the test for determining fluidity (penetrometer test) prescribed in the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).
- Incorporate by reference the Compressed Gas Association’s (CGA) publication C-20-2014, “Requalification Standard for Metallic, DOT and TC 3-series Gas Cylinders and Tubes Using Ultrasonic Examination,” Second Edition, which will eliminate the need for some existing DOT special permits and allow alternative methods for the requalification of cylinders. This revision would eliminate the need for special permit applications and renewals.
- Incorporate by reference the updated Appendix A of CGA publication C-7-2020, “Guide to Classification and Labeling of Compressed Gases,” Eleventh Edition.
- Incorporate by reference the CGA publication C-27-2019, “Standard Procedure to Derate the Service Pressure of DOT 3-Series Seamless Steel Tubes, First Edition.”
- Incorporate by reference the CGA publication CGA C-29-2019, “Standard for Design Requirements for Tube Trailers and Tube Modules, First Edition.”
- Incorporate by reference the CGA publication CGA V-9-2019, “Compressed Gas Association Standard for Compressed Gas Cylinder Valves, Eighth Edition.”

II. Incorporation by Reference Discussion Under 1 CFR Part 51

According to the Office of Management and Budget (OMB), Circular A-119, “Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities,” government agencies must use voluntary consensus standards wherever practical in the development of regulations.

PHMSA currently incorporates by reference into the HMR all or the relevant parts of several standards and specifications developed and published by standard development organizations (SDOs). In general, SDOs update and revise their published standards every two to five years to reflect modern technology and best technical practices. The National Technology Transfer and Advancement Act of 1995 (NTTAA; Pub. L. 104-113, 15 U.S.C. 272 note) directs Federal agencies to use standards developed by voluntary consensus standards bodies in lieu of government-written standards unless doing so would be inconsistent with applicable law or otherwise impracticable. Voluntary consensus standards bodies develop, establish, or coordinate technical standards using agreed-upon procedures. OMB issued Circular A-119 to implement section 12(d) of the NTTAA relative to the utilization of consensus technical standards by Federal agencies. This circular provides guidance for agencies participating in voluntary consensus standards bodies and describes procedures for satisfying the reporting requirements in the NTTAA. Consistent with the requirements of the NTTAA and its statutory authorities, PHMSA is responsible for determining which currently referenced standards should be updated, revised, or removed, and which standards should be added to the HMR. Revisions to materials incorporated by reference in the HMR are handled via the rulemaking process, which allows the public and regulated entities to provide input. During the rulemaking process, PHMSA must also obtain approval from the Office of the Federal Register to incorporate by reference any new materials. Regulations of the Office of the Federal Register require that agencies detail in the preamble of a final rule the ways the materials it incorporates by reference are reasonably available to interested parties, or how the agency worked to make those materials reasonably available to interested parties. (*See* 1 CFR 51.5.)

IME standards are free and accessible to the public via the IME website at https://www.ime.org/products/category/safety_library_publications_slps. The CGA references are available for interested parties to purchase in either print or electronic editions through the CGA organization website at <https://portal.cganet.com/Publication/index.aspx>. The UN manual

of test and criteria is available at

https://unece.org/fileadmin/DAM/trans/danger/publi/manual/Rev7/Manual_Rev7_E.pdf. The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) can be found at <https://unece.org/about-adr>. The specific standards are discussed in greater detail in the section-by-section review.

The following standards appear in the amendatory text of this document and have already been approved for the locations in which they appear: ASTM D 4359-90, “Standard Test Method for Determining Whether a Material is a Liquid or a Solid; CGA Technical Bulletin (TB): 2008-25, “Design Considerations for Tube Trailers;” ISO 6406:2005(E), “Gas cylinders—Seamless steel gas cylinders—Periodic inspection and testing;” and ISO 16148:2016(E), “Gas cylinders—Refillable seamless steel gas cylinders and tubes—Acoustic emission examination (AT) and follow-up ultrasonic examination (UT) for periodic inspection and testing.”

III. NPRM: Publication and Public Comments: Executive Order 13924

On March 3, 2023 [88 FR 13624], PHMSA published a notice of proposed rulemaking (NPRM) in the *Federal Register*, titled “Hazardous Materials: Adoption of Miscellaneous Petitions and Updating Regulatory Requirements,” under Docket No. PHMSA-2020-0102 (HM-219D). The NPRM proposed revisions to the HMR in response to 18 petitions for rulemaking submitted to PHMSA by various stakeholders in addition to miscellaneous issues such as special permit procedures and harmonizing the HMR with revisions to the Environmental Protection Agency (EPA) regulations. PHMSA discusses these petitions and revisions in detail in section IV (Discussion of Amendments and Applicable Comments) of the preamble to this final rule.

The comment period for the NPRM originally closed on May 3, 2023. On April 6, 2023, PHMSA received a request from Worthington Industries to extend the comment period for the NPRM. In response to the request from Worthington Industries, PHMSA published a document on April 26, 2023 [88 FR 25335], extending the comment period to June 16, 2023. PHMSA

received a total of 14 sets of comments from eight separate entities, three of which had submitted petitions that were the basis for HMR amendments proposed in the NPRM. PHMSA received comments from Chemours after the June 16, 2023, deadline. Consistent with 49 CFR 107.70(b), PHMSA considered those late-filed comments given the commenter’s interests in the rulemaking and the absence of additional expense or delay resulting from their consideration. An alphabetical list of the persons, companies, and associations that submitted comments to the HM-219D NPRM are listed in the below table:

Commenter Name	Docket No.
Arkema	https://www.regulations.gov/comment/PHMSA-2020-0102-0016
Chemours	https://www.regulations.gov/comment/PHMSA-2020-0102-0015
Chemours	https://www.regulations.gov/comment/PHMSA-2020-0102-0021
Compressed Gas Association (CGA)	https://www.regulations.gov/comment/PHMSA-2020-0102-0010
Council on the Safe Transportation of Hazardous Articles (COSTHA)	https://www.regulations.gov/comment/PHMSA-2020-0102-0011
Dangerous Goods Advisory Council (DGAC)	https://www.regulations.gov/comment/PHMSA-2020-0102-0012
Heating, Air-Conditioning, & Refrigeration Distributors International	https://www.regulations.gov/comment/PHMSA-2020-0102-0018
Heating, Air-Conditioning, & Refrigeration Distributors International	https://www.regulations.gov/comment/PHMSA-2020-0102-0017
Institute for the Makers of Explosives	https://www.regulations.gov/comment/PHMSA-2020-0102-0006
The Dow Chemical Company	https://www.regulations.gov/comment/PHMSA-2020-0102-0013
The Plumbing-Heating-Cooling Contractors—National Association (PHCC)	https://www.regulations.gov/comment/PHMSA-2020-0102-0004
Worthington Industries	https://www.regulations.gov/document/PHMSA-2020-0102-0003
Worthington Industries	https://www.regulations.gov/comment/PHMSA-2020-0102-0019
Worthington Industries	https://www.regulations.gov/comment/PHMSA-2020-0102-0014

The comments submitted to this docket may be accessed via the docket file numbers listed in the above table, as well as at <https://www.regulations.gov>. PHMSA developed this final rule in consideration of the comments received to the public docket.

IV. Discussion of Amendments and Applicable Comments

Based on an assessment of the 18 petitions and two miscellaneous amendments and the comments received in response to the NPRM, PHMSA is amending the HMR as detailed in this section.

A. Transportation of compressed natural gas/methane in UN pressure receptacles

In its petition (P-1714),¹ CGA requests that PHMSA consider an amendment to § 173.302b to implement packaging restrictions for the transportation of compressed natural gas (CNG) and methane in United Nations (UN) seamless steel pressure receptacles with a tensile strength greater than 950 MPa. For the purposes of the HMR, “UN1971, Methane, compressed” is compressed natural gas that is at least 98 percent methane and free of corroding components. CGA expresses concern regarding the growth in transport of CNG and methane in these packagings, and wants to ensure the safety of the receptacles in this service.

CGA provides the historical context of PHMSA’s predecessor agency imposing similar packaging restrictions for CNG transported in certain DOT specification cylinders. (*See* § 173.302a(a)(4).) These restrictions were intended to limit the effect of impurities in the CNG, such as hydrogen sulfide, on the structural integrity of the steel used in the manufacture of the cylinders. CGA cites several studies on the corrosive effects of natural gas contaminants on a cylinder and notes that the contaminants are usually noncorrosive in the absence of liquid water. Finally, CGA highlights an October 27, 1977, incident in which two people were killed, four people were injured, and a compressor station was damaged when a DOT specification 3T seamless steel cylinder ruptured while being filled with natural gas contaminated with hydrogen sulfide and water.

CGA’s specific concern is in regard to UN seamless steel pressure receptacles with ultimate tensile strengths greater than 950 MPa being used for the storage and transportation of CNG. Higher strength UN seamless steel pressure receptacles are susceptible to embrittlement from CNG contaminants and embrittlement makes the receptacles more susceptible to fracture.

Currently, use of UN pressure receptacles for CNG and methane in transportation is subject to the general requirements for shipment of compressed gases in § 173.301; additional general requirements of UN pressure receptacles in § 173.301b; and the filling requirements of

¹ P-1714 – CGA (PHMSA-2018-0054), <https://www.regulations.gov/docket/PHMSA-2018-0054>.

cylinders with non-liquefied (permanent) gases in § 173.302. However, under current regulations, there are no additional requirements specific to the use of UN pressure receptacles in CNG or methane service.

In the NPRM, PHMSA proposed to revise § 173.302b to include conditions for the transportation of CNG and methane in UN stainless steel pressure receptacles. The NPRM referenced content within CGA's petition requesting such revision, stating that natural gas/methane can be safely transported in UN steel pressure receptacles under the following conditions:

- The product is non-liquefied gas.
- The UN seamless steel pressure receptacle has a maximum tensile strength not greater than 950 MPa (137,750 psig), and bears an "H" mark indicating the cylinder is manufactured from a specific type of steel that is intended to prevent hydrogen embrittlement.
- Each UN tube has a drain tube.
- The moisture content and concentration of the corroding components in the product conforms to the requirements in § 173.301b(a)(2). Specifically, the requirements in § 173.301b(a)(2) state that gases or gas mixtures must be compatible with the UN pressure receptacle and valve materials, as prescribed for metallic materials in International Organization for Standardization (ISO) 11114-1:2012(E), "Gas cylinders — Compatibility of cylinder and valve materials with gas contents."

In addition, the NPRM included the CGA-requested proposal to include new text that clarifies the requirements for transporting methane gas with a purity of at least 98 percent within a UN seamless steel pressure receptacle.

PHMSA also noted in the NPRM that it had previously considered this issue under petition P-1661² submitted by CGA on July 15, 2015. That petition was denied due to its conflict with the requirements in § 173.302a(a)(4) for DOT specification 3AAX and 3T cylinders when used in methane service. Currently, § 173.302a(a)(4) only allows methane that is non-liquefied; has a minimum purity of 98 percent; and is commercially free from corroding components to be filled in specification (3AX, 3AAX, and 3T) cylinders. PHMSA agreed that DOT specification 3T cylinders with a tensile strength in the range of 135–155 kilopounds per square inch (ksi) [931–1,069 megapascals per square inch (MPa)] and steel embrittlement can become a safety issue. However, DOT specification 3AX and 3AAX cylinders typically have strength below 135 ksi (931 MPa), and steel embrittlement is usually not a safety concern.

In its denial letter, PHMSA encouraged CGA to consider a revised petition and limit cylinders to steel strengths below 950 MPa for ISO cylinders made in accordance with ISO 9809-1:2010, “Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing,” and ISO 11120, “Gas cylinders—Refillable seamless steel tubes of water capacity between 150 l and 3000 l—Design, construction and testing” standards. This is because, had PHMSA proposed P-1661, it would have caused conflicting requirements for methane shipments in specification (3AAX, 3T, etc.) cylinders versus shipments in UN steel cylinders (ISO 9809-1 and ISO 11120 standards).

In response to PHMSA’s denial of P-1661, CGA submitted a new petition (P-1714) that addresses PHMSA’s concerns by not including DOT 3T specification cylinders where steel embrittlement poses an unreasonable risk. As a result of PHMSA’s technical review of CGA petition (P-1714), and because it requested regulatory amendments for shipment of methane (including CNG with a methane content of 98 percent or greater) only in UN cylinders, PHMSA determined that the proposals in P-1714 would be limited to pressure receptacles where steel embrittlement is not a safety issue. Additionally, PHMSA notes this revision will align HMR

² P-1661 – CGA (PHMSA-2015-0169), <https://www.regulations.gov/docket/PHMSA-2015-0169>.

references to UN cylinders with equivalent DOT specification cylinders. PHMSA further agrees that CNG, other than methane, can cause steel embrittlement in seamless steel pressure receptacles with tensile strengths greater than 950 MPa. Therefore, PHMSA believes the changes outlined in the CGA petition P-1714 will improve the safe transportation of CNG.

As noted in the NPRM, PHMSA conducted an economic review of this petition and expects these amendments will not result in any material changes in costs or operations for market participants because they are accepted industry practices and address an important safety concern. To the degree that market participants are currently transporting low-purity methane in high-tensile strength receptacles, affected participants would be required to use substitute packaging. Similarly, these revisions will provide safety benefits to the extent there is any noncompliance with the practice presented by CGA. A more detailed discussion of this economic analysis can be found in the Regulatory Impact Analysis (RIA) posted in the docket to this rulemaking.

PHMSA received comments from CGA and DGAC in support of the revisions to § 173.302b(f) as proposed. PHMSA did not receive any comments opposing the proposed revisions. Therefore, PHMSA revises the requirements for transporting CNG with methane in certain UN specification seamless stainless steel cylinders. Amending these requirements will enhance safety by authorizing CNG of less than 98 percent methane only in pressure receptacles where steel embrittlement is unlikely to occur.

B. Threading and repair of seamless DOT 3-series specification cylinders and seamless UN pressure receptacles

In its petition (P-1716),³ FIBA Technologies, Inc. (FIBA) requests PHMSA consider a revision to the requirements for repairing seamless DOT 3-series specification cylinders and seamless UN pressure receptacles manufactured without external threads, and also to authorize

³ P-1716 – FIBA (PHMSA-2018-0074), <https://www.regulations.gov/docket/PHMSA-2018-0074>.

the performance of this work without requiring prior approval from PHMSA. Specifically, this petition requests that PHMSA authorize machining new threads on a previously manufactured seamless cylinder or seamless UN pressure receptacle without requiring an approval. Further, FIBA requests that PHMSA expand the population of UN pressure receptacles eligible for repair work. Regarding external threads, in accordance with the current § 180.212(b)(2), repair work not requiring prior approval is limited to the “rethreading” of DOT specification 3AX, 3AAX, or 3T cylinders, or a UN pressure receptacle mounted in multiple-element gas containers (MEGC).⁴

FIBA notes there are older DOT specification 3AAX cylinders that were not equipped with external neck threads at the time of manufacture. These cylinders were manufactured in the 1960s, and were mounted on a semi-trailer by inserting the tube neck into a flange on the semi-trailer bulkhead and then secured in place using set screws. FIBA argues that these methods have been mostly abandoned in favor of a threaded tube neck because a threaded flange and anti-rotation pins provide a more secure connection. Moreover, risk will be reduced by a threaded neck surface and flange connection, rather than a neck with no threads and set screws, because the threaded neck and flange more securely mount the cylinders and tubes within the MEGC or motor vehicle (tube trailer or frame). Set screws do greater damage to the tube than a threaded neck and flange because of the penetration depth required to achieve a secure connection.

Section 180.212(b)(2) already allows the repair of damaged threads, which can be so worn as to be the same as a tube manufactured with no outer diameter neck threads. FIBA argues that there is no difference between threads no longer capable of joining the tube neck to the flange and a tube neck having no threads from the start. The same threading process will be performed on the tube with worn threads as the tube with no threads. Additionally, the same CGA C-23 evaluation process used to determine suitability of the tube neck for rethreading will be used to confirm the suitability of the neck for threading.

⁴ A multiple-element gas container 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 gases.

As noted in the NPRM, PHMSA has conducted a technical review of this petition and now determines that authorizing the threading of DOT 3AX; 3AAX manufactured without external threads; or 3T specification cylinders; or UN pressure receptacles will enhance safety by authorizing a more secure method of connecting MEGC pressure receptacles. PHMSA concludes this is an improvement over the previous method of using set screws to secure the tubes, a process that results in indentations being carved into the tube necks as the tube jostles during transport. Moreover, DOT did not originally authorize the threading of previously manufactured cylinders due to a lack of standardized safe threading practices at the time PHMSA adopted provisions for these cylinders. Lastly, PHMSA concludes that the machining of neck threads or rethreading of seamless UN pressure receptacles should be authorized regardless of whether the receptacle is mounted in a MEGC. As such, standardization in the area of cylinder connections is vital to reducing damage to the cylinder necks and thus to reducing hazardous materials releases. In summary, the technical review of this petition determines the revision will improve safety by ensuring a more secure connection to the motor vehicle.

PHMSA has determined that this revision will not impose any costs to industry. Further, it has determined that the changes would provide appropriate regulatory flexibility and potential cost savings (i.e., avoided costs associated with an unnecessary approval application process or use of an outdated securement method) without any impact on safety. A more detailed discussion of this economic analysis of this revision can be found in the RIA posted to the docket for this rulemaking.

PHMSA received comments from both CGA and DGAC in support of the revision as proposed. PHMSA did not receive any comments opposing these revisions. Therefore, in this final rule, PHMSA revises § 180.212(b)(2) to allow the machining of external threads on all seamless DOT specification 3AX, 3AAX, or 3T cylinders, or a seamless UN pressure receptacle originally manufactured without external threads. Additionally, PHMSA authorizes the

machining of neck threads or rethreading of UN pressure receptacles regardless of whether the receptacle is mounted in a MEGC.

C. Clarification of the requirements for certain non-liquefied compressed gases

In its petition (P-1717),⁵ FIBA requests that PHMSA consider an amendment to § 173.302a(c) of the HMR for the special filling limits for DOT specification 3A, 3AX, 3AA, and 3AAX cylinders containing Division. 2.1 (flammable) gases. The HM-233F final rule⁶ adopted DOT Special Permit (DOT-SP) 6530⁷ into the HMR. This revision authorized the transportation in commerce of hydrogen and mixtures of hydrogen with helium, argon, or nitrogen in certain cylinders filled to 10 percent in excess of their marked service pressure. As part of the HM-233F final rule, PHMSA adopted safety control measures in paragraph (c)(3) of § 173.302a instead of paragraph (c). In the NPRM, in response to FIBA's request, PHMSA proposed to amend § 173.302a(c)(3) to clarify that the requirements in § 173.302a(c)(3)(i) and (ii) are independent provisions. FIBA asserts this revision will accurately reflect the technical conditions associated with the design and manufactured properties of DOT specification 3A, 3AX, 3AA, and 3AAX cylinders.

FIBA also submitted petition (P-1725)⁸ requesting further amendments to § 173.302a(c), concurrent with those requested in P-1717. In the NPRM, in response to FIBA's request, PHMSA proposed a requirement that the plus sign (+) be added following the test date marking on a DOT specification 3A, 3AX, 3AA, and 3AAX cylinder filled with hydrogen or mixtures of hydrogen with helium, argon, or nitrogen to signify that the cylinder may be filled to 10 percent in excess of its marked service pressure. Furthermore, FIBA requested that cylinders qualifying for the special filling limit in § 173.302a(c) also be equipped with a pressure relief device (PRD),

⁵ P-1717 – FIBA (PHMSA-2018-0075), <https://www.regulations.gov/docket/PHMSA-2018-0075>.

⁶ 81 FR 3635 (Jan. 21, 2016).

⁷ DOT SP-6530, <https://cms7.phmsa.dot.gov/approvals-and-permits/hazmat/file-serve/offer/SP6530.pdf/2018019065/SP6530>.

⁸ P-1725 – FIBA (PHMSA-2018-0112), <https://www.regulations.gov/docket/PHMSA-2018-0112>.

in accordance with CGA S-1.1 (2011), rather than the requirements in § 173.302a(c)(4), which could potentially conflict with each other. CGA S-1.1 prescribes standards for selecting the correct PRD to meet the requirements of § 173.301(f) for more than 150 gases. It also provides guidance on when a PRD can be optionally omitted and when its use is prohibited, as well as direction on PRD manufacturing, testing, operational parameters, and maintenance. At the time FIBA submitted P-1725, CGA S-1.1 (2011) had not been incorporated by reference into the HMR. Since then, the HM-234 final rule⁹ was published, which incorporated by reference CGA S-1.1 (2011) into the HMR and outlines the PRD requirements for cylinders filled with a gas and offered for transportation.

The plus sign marking (+) is associated with a commonly applied provision in the HMR that authorizes a DOT specification cylinder to be filled to 10 percent in excess of its marked pressure. FIBA states that the plus sign marking (+) is an important means of communicating to cylinder refillers that a cylinder can be filled to 10 percent more than its marked service pressure and, thus, should be added to the special filling requirements in § 173.302a(c).

As noted in the NPRM, PHMSA conducted a technical review of the proposals in both petitions along with DOT-SP 6530 and the HM-233F final rule. After this review, PHMSA noted in the NPRM that it agrees with FIBA that the safety control measures within DOT-SP 6530 were independent provisions. In the HM-233F final rule, PHMSA intended to adopt those provisions into the HMR as independent provisions and inadvertently adopted two of the safety controls in § 173.302(c)(3)(i) and (ii) as paragraphs of § 173.302a(c)(3). In addition, the NPRM noted that PHMSA concurs that the revision to require the plus sign (+) on DOT specification 3A, 3AX, 3AA, and 3AAX cylinders filled with hydrogen or mixtures of hydrogen with helium, argon, or nitrogen would improve the safety of filling these cylinders by providing clarity on the conditions for special filling limits and helping prevent the overfilling of unauthorized cylinders. Finally, PHMSA noted it agrees that cylinders in hydrogen service that are filled to 10 percent in

⁹ 85 FR 85380 (Dec. 28, 2020).

excess of its marked pressure should be equipped with a PRD that is selected as to type, location, and quantity, and tested in accordance with CGA S-1.1, in the same manner as is generally required for cylinders filled with a gas, in accordance with § 173.301(f), instead of § 173.302a(c)(4). PHMSA determined that CGA S-1.1 provides much greater specificity than § 173.302a(c)(4) about the type of pressure relief device required for a particular gas service.

PHMSA now concludes that the amendments associated with P-1717 will provide greater clarity on requirements for cylinder design and manufacture, and will not represent any incremental, quantifiable safety effects because PHMSA already authorizes the transportation in commerce of hydrogen and mixtures of hydrogen with helium, argon, or nitrogen in certain cylinders filled to more than 10 percent of their marked service pressures. These amendments will also not impose any new or incremental cost because they merely reorganize the regulations for clarity. Additionally, while amendments associated with P-1725 would create a new requirement, PHMSA determines this amendment will result in only minimal incremental costs to the industry, and impose only minimal regulatory burden on small businesses or other entities. The additional request that the cylinders qualified for the special filling limit be equipped with pressure relief devices in accordance with CGA S-1.1 will not add any additional cost on affected industries or entities. Currently, § 173.302a(c)(4) contains the same requirements as CGA S-1.1 and therefore the addition of the CGA S-1.1 requirement will not cause any new additional costs beyond those already accounted for previously. A more detailed discussion of the economic analysis of the proposal can be found in the RIA posted to the docket for this rulemaking.

PHMSA received a comment from CGA in support of the revision as proposed. PHMSA did not receive any comments in opposition to the proposed revision. Therefore, in this final rule, PHMSA revises § 173.302a(c) to reflect the safety provisions currently in § 173.302a(c)(3)(i) and (ii) are independent material construction requirements under paragraph (c) and as such have separated them into new paragraphs (c)(4) and (5). Moreover, PHMSA adds a requirement in

§ 173.302a(c)(7) to require the plus sign (+) following the test date marking to indicate compliance with paragraph (c), indicating that the cylinder is allowed to be filled to more than 10 percent of its marked service pressure. Lastly, PHMSA replaces the PRD requirements—found in current § 173.302a(c)(4)—with a new § 173.302a(c)(6). The new provision requires that cylinders must be equipped with PRDs sized and selected as to type, location, and quantity and tested in accordance with CGA S-1.1 (2011) and § 173.301(f).

D. *De minimis* quantities of poisonous materials

In its petition (P-1718),¹⁰ the Council on Safe Transportation of Hazardous Articles, Inc. (COSTHA) requests that PHMSA amend § 173.4b to harmonize the *de minimis* exceptions for Division 6.1, Packing Group (PG) I (no inhalation hazard) materials with international regulations, including the International Civil Aviation Organization Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO TI) and the International Maritime Dangerous Goods Code (IMDG Code). The *de minimis* exceptions in the HMR provide relief from the general requirements of the HMR for certain hazardous materials shipped in extremely small quantities. The maximum quantity allowed in order to utilize the *de minimis* exception per inner receptacle is 1 mL for authorized liquids and 1 g for authorized solids. Additionally, the aggregate quantity per package may not exceed 100 mL for liquids and 100 g for solids. The exception also requires cushioning and package testing requirements, along with specific provisions for certain materials.

International harmonization includes adopting changes in the HMR to improve regulatory consistency with international regulations and standards, such as the IMDG Code, the ICAO TI, and the UN Recommendations on the Transport of Dangerous Goods - Model Regulations (UN Model Regulations). Harmonization facilitates international trade by minimizing the costs and other burdens of complying with multiple or inconsistent safety requirements for transportation

¹⁰ P-1718 – COSTHA (PHMSA-2018-0077), <https://www.regulations.gov/docket/PHMSA-2018-0077>.

of hazardous materials. Safety is enhanced by creating a uniform framework for compliance. As the volume of hazardous materials transported in international commerce continues to grow, harmonization is increasingly important. Moreover, the Federal Hazardous Materials Transportation Law (HMTA; 49 U.S.C. 5101 *et seq.*) directs PHMSA to participate in relevant international standard-setting bodies and promotes consistency of the HMR with international transport standards to the extent practicable.

The exceptions in the HMR for *de minimis* quantities were initially adopted in the HM-224D/HM-215J final rule¹¹ in § 173.4b of the HMR, and were intended to align with the provisions for *de minimis* exceptions found in the ICAO Technical Instructions and IMDG Code. However, HM-224D/HM-215J addressed exceptions for *de minimis* quantities of only Division 6.1, PG II and PG III hazardous materials. As noted in the PHMSA Letter of Interpretation (LOI) reference number (Ref. No.) 17-0138,¹² PHMSA considered exceptions for *de minimis* quantities of only Division 6.1, PG II and PG III hazardous materials in response to a petition for rulemaking.

In the NPRM, PHMSA proposed to harmonize the scope of the applicability of the *de minimis* exceptions with what is allowed under the international standards by including Division 6.1, PG I materials (no inhalation hazard). As discussed in the NPRM, a technical review of this petition found the inclusion of *de minimis* quantities for Division 6.1, PG I (no inhalation hazard) materials into the international regulations can be traced back to working paper ST/SG/AC.10/C.3/2009/45,¹³ which was submitted by the United States. Based on the review of this working paper, PHMSA noted that it had preliminarily concluded that Division 6.1, PG I (no inhalation hazard) materials should be included as part of the *de minimis* exception.

¹¹ 74 FR 2200 (Jan. 14, 2009).

¹² PHMSA LOI 17-0138, <https://www.phmsa.dot.gov/regulations/title49/interp/17-0138>.

¹³ Working paper ST/SG/AC.10/C.3/2009/45, <https://unece.org/DAM/trans/doc/2009/ac10c3/ST-SG-AC10-C3-2009-45e.pdf>.

PHMSA noted in the NPRM that the primary concern regarding the transportation of a Division 6.1, PG I (no inhalation hazard) material is leakage from a package and potential human exposure. A leak of such a material poses a risk to human health by poisoning. To counter these concerns, this hazard is mitigated by the conditions for transportation in the *de minimis* exceptions, namely, imposing limitations on the quantities allowed to 1 mL or 1 g per inner receptacle. In addition, § 173.4b requires that inner receptacles have removable closures sealed by wire, tape, or other positive means (*see* § 173.4b(a)(2)), which limits the possibility for leakage. Furthermore, a Division 6.1 PG I material that does not pose an inhalation hazard equally poses no vaporization risk should the package rupture. Lastly, *de minimis* packages are required to have cushioning and absorbent material that are not reactive with the hazardous material and can absorb the entirety of the package's contents if the receptacle ruptures. These requirements severely limit the risk of exposure presented by transportation of these materials.

While maintaining safety as described in the prior paragraph, PHMSA concludes in this final rule that this harmonization will not impose any direct costs on industry, and will provide cost savings to shippers by providing the option to ship Division 6.1, PG I (no inhalation hazard) materials under the *de minimis* provisions that provide alternative communication and packaging requirements associated with the preparation of these packages. In total, PHMSA estimates that the revision will result in cost savings of approximately \$178,570 annually. A more detailed discussion of the economic analysis of the proposal can be found in the RIA posted to the docket for this rulemaking.

PHMSA received comments from both COSTHA and DGAC in support of the revisions as proposed. PHMSA did not receive any comments in opposition to the proposed revision. Therefore, upon review of the COSTHA petition to revise the *de minimis* quantities exception to include Division 6.1, PG I materials (no inhalation hazard), PHMSA revises § 173.4b to include Division 6.1, PG I materials (no inhalation hazard) to the list of authorized materials in § 173.4b(a). PHMSA finds expanding the *de minimis* exceptions to Division 6.1, PG I materials

(no inhalation hazard) will maintain the safety of transportation of hazardous materials and provide cost savings through alternative packaging options.

E. Clarification of the marking requirements for button cell lithium batteries contained in equipment

In its petition (P-1726),¹⁴ COSTHA requests that PHMSA amend § 173.185(c)(3) to clarify that lithium button cell batteries installed in equipment are excepted from the marking requirement and not subject to the quantity per package or per consignment limitation. Currently, § 173.185(c)(3) states: “Each package must display the lithium battery mark except when a package contains button cell batteries installed in equipment (including circuit boards), or no more than four lithium cells or two lithium batteries contained in equipment, where there are not more than two packages in the consignment.” In its petition, COSTHA asserts that the language and grammar used to convey the exception from display of the lithium battery mark has led some in industry to interpret the exception for button cell batteries to be dependent on the number of cells in a package or the number of packages in the consignment. Industry has made several requests for letters of interpretation—12-0261,¹⁵ 14-0013,¹⁶ 15-0171,¹⁷ and 16-0172¹⁸—that illustrates the confusion within the regulated community.

PHMSA published final rule HM-224F¹⁹ to revise the HMR applicable to the transport of lithium cells and batteries, consistent with the UN Model Regulations, the ICAO Technical

¹⁴ P-1726 – COSTHA (PHMSA-2019-0002), <https://www.regulations.gov/docket/PHMSA-2019-0002>.

¹⁵ PHMSA LOI 12-0261;

<https://cms7.phmsa.dot.gov/sites/phmsa.dot.gov/files/legacy/interpretations/Interpretations/2012/120261.pdf>.

¹⁶ PHMSA LOI 14-0013;

<https://cms7.phmsa.dot.gov/sites/phmsa.dot.gov/files/legacy/interpretations/Interpretation%20Files/2014/140013.pdf>.

¹⁷ PHMSA LOI 15-0171;

<https://cms7.phmsa.dot.gov/sites/phmsa.dot.gov/files/legacy/interpretations/Interpretation%20Files/2016/150171.pdf>.

¹⁸ PHMSA LOI 16-0172;

<https://cms7.phmsa.dot.gov/sites/phmsa.dot.gov/files/legacy/interpretations/Interpretation%20Files/2017/160172.pdf>.

¹⁹ 79 FR 46011 (Aug. 6, 2014).

Instructions, and the IMDG Code. As part of final rule HM-224F, PHMSA consolidated the requirements for shipping and transporting lithium cells and batteries into § 173.185 by:

- Requiring cells and batteries to be tested in accordance with the latest revisions to the UN Manual of Tests and Criteria, and requiring manufacturers to retain evidence of successful completion of UN testing.
- Eliminating the exceptions for small cells and batteries in air transportation, except with respect to extremely small cells packed with or contained in equipment.
- Providing relief for (1) the shipment of low production run and prototype batteries, and (2) batteries being shipped for recycling or disposal.

In the NPRM, PHMSA proposed to revise § 173.185(c)(3) to clarify the applicability of the lithium battery mark exception for button cell batteries installed in equipment. Consistent with the COSTHA petition, PHMSA noted that its proposed revisions would clarify that the exception in § 173.185(c)(3) applies when a package contains only button cell batteries installed in equipment; or when there is a consignment consisting of two packages or less, and each package contains no more than four lithium cells or two batteries installed in equipment.

PHMSA now concludes that this revision to the HMR is neither expected to result in a cost to industry nor a change to the safety requirements for packages containing lithium button cell batteries contained in equipment. The revision simply clarifies how the exception is applied for better understanding by the reader. Since PHMSA already authorizes this lithium battery mark exception, the change will not represent a quantifiable safety effect. Qualitatively, improved regulatory clarity will assist the regulated community in complying with the requirement and properly exercising the exception. Some entities were reasonably confused by the current text and applied the required mark unnecessarily. To the extent this occurred, the revision could provide economic benefit while maintaining safety. PHMSA determines there is limited risk in excepting packages of button cell lithium batteries installed in equipment from the

lithium battery mark. A more detailed discussion of the economic analysis of the proposal can be found in the RIA posted to the docket for this rulemaking.

PHMSA received comments from both COSTHA and DGAC in support of this revision as proposed. PHMSA did not receive any comments in opposition to the proposed revision. Therefore, PHMSA now revises the introductory language in § 173.185(c)(3) to clarify that lithium button cell batteries installed in equipment are not subject to any quantity per package or consignment limitations when applying the exception.

F. Incorporate by reference CGA C-20 (2014)

In its petition (P-1727),²⁰ CGA requests that PHMSA incorporate by reference CGA C-20 (2014), “Requalification Standard for Metallic, DOT, and TC 3-Series Gas Cylinders and Tubes Using Ultrasonic Examination, Second Edition.” CGA also proposes to revise § 180.205 to reflect the ultrasonic examination (UE) methods authorized by CGA C-20. CGA C-20 are an industry standard for the periodic requalification of certain metallic DOT and Transport Canada (TC) 3-series cylinders and tubes. CGA asserts that the incorporation by reference of CGA C-20 would eliminate the need for many special permits that authorize the use of UE methods and would harmonize the various UE methods to requalify these pressure receptacles. CGA further asserts that this standard would establish a uniform set of techniques, uniform acceptance and rejection criteria, and a standard calibration method used during the requalification process of these 3-series gas cylinders and tubes, in contrast to the current special permits, which vary on the requirements associated with use of the UE nondestructive testing methodology for requalification. Finally, the petition asserts that the incorporation by reference of CGA C-20 would enhance public safety by clarifying and mandating consistent requalification practices using UE throughout the gas industry. In the NPRM, PHMSA proposed the incorporation by reference of CGA C-20 (2014), “Requalification Standard for Metallic, DOT and TC 3-Series

²⁰ P-1727 – CGA (PHMSA-2019-0007), <https://www.regulations.gov/docket/PHMSA-2019-0017>.

Gas Cylinders and Tubes Using Ultrasonic Examination, Second Edition” and to revise § 180.205 to reflect the UE methods authorized by CGA C-20 (2014).

CGA C-20 identifies and describes the various acceptable UE methods that may be used in place of the baseline HMR requirements (e.g., internal visual inspection and hydrostatic requalification methods) used to examine certain metallic DOT/TC 3-series gas cylinders and tubes. This standard also specifies the allowable flaw acceptance/rejection criteria.

Under the HMR, requalification periods for DOT/TC 3-series specification cylinders range from three to 12 years, depending on the specification under which each cylinder was made (e.g., 3, 3AA, etc.). Periodic requalification ensures the safety of cylinders by checking for leaks and damage that might threaten the integrity of a cylinder. Cylinders are requalified using volumetric expansion testing, proof pressure testing, and external and internal visual inspections. Currently, a person must apply for a special permit in order to receive authorization to use UE in lieu of the requalification requirements in § 180.205.

CGA notes that the increased use of UE necessitates clear and consistent instruction in the application of this technical method, as well as the adherence to proper calibration and acceptance/rejection criteria. CGA asserts that the modifications ensure that this requalification method is applied consistently to safeguard cylinder serviceability.

PHMSA noted in the NPRM that it had participated in the task force meetings, provided technical assistance during the development of CGA C-20, and completed a technical review of the final standard. As discussed in the NPRM, PHMSA has conducted a technical review and determined that the CGA C-20 standard will positively impact safety by prescribing appropriate procedures for applying UE as the requalification method for DOT/TC 3-series cylinders and tubes.

The total cost savings for industry regarding requalification using CGA C-20 is based on the number of active special permits and the costs associated with periodic renewal of the special permit. We estimate average annual industry cost savings of \$30,313 due to companies no longer

being required to apply for a special permit. A more detailed discussion of the economic analysis of this revision can be found in the RIA posted to the docket for this rulemaking.

PHMSA received comments from CGA and DGAC in support of the revisions as proposed. PHMSA did not receive any comments in opposition to the proposed revisions. Therefore, PHMSA adds a reference to CGA C-20, “Methods For Ultrasonic Examination Of Metallic, DOT, And TC 3-Series Gas Cylinders And Tubes, Second Edition,” in § 171.7, and revises § 180.205 to reflect the UE methods authorized by CGA C-20. In addition, as proposed in the NPRM, PHMSA revises § 180.205(i) to state that when a cylinder containing hazardous materials is condemned, the requalifier must stamp the cylinder “CONDEMNED” and affix a readily visible label on the cylinder stating: “UN REJECTED, RETURNING TO ORIGIN FOR PROPER DISPOSITION.” PHMSA also is clarifying that the requalifier may only transport the condemned cylinder by private motor vehicle carriage to a facility capable of safely removing the contents of the cylinder. Lastly, the NPRM inadvertently left out necessary revisions to table 1 to paragraph (a) in § 180.209 that reference the inclusion of UE for DOT 3T cylinders and certain special permit cylinders. Therefore, in this final rule, PHMSA is revising table 1 to paragraph (a) in § 180.209 to reference UE for the cylinders intended to be allowed to undergo UE as proposed and revised in § 180.205.

G. Gas mixtures containing components defined as liquefied gases

In its petition (P-1728),²¹ CGA proposes that PHMSA authorize an alternative description of gas mixtures containing components defined as liquefied gases. The CGA petition would revise the HMR to allow for a gas mixture with components that meet the definition of liquefied compressed gas in § 173.115(e) to be described as a “compressed gas” when the partial pressures of the liquefied gas components of the mixture are intentionally reduced so that liquefaction does not occur at 20°C (68°F). CGA requests in its petition that special provisions be added to Column

²¹ P-1728 – CGA (PHMSA-2019-0018), <https://www.regulations.gov/docket/PHMSA-2019-0018>.

(7) in the Hazardous Material Table (HMT) in § 172.101 applicable to liquefied gas mixtures. In the NPRM, PHMSA proposed to revise § 173.115(e) to allow for a gas mixture with components that meet the definition of liquefied compressed gas to be described as a “compressed gas” when the partial pressures of the liquefied gas components of the mixture are intentionally reduced so that liquefaction does not occur at 20°C (68°F).

Some compressed gas mixtures contain components that when shipped in their pure form would be considered a liquefied gas. However, when the gas is in a mixture, it can be manipulated to be entirely gaseous at its intended use temperature of 20°C (68°F) by reducing the components’ partial pressures. Partial pressure is the pressure that would be exerted by one of the gases in a mixture if it occupied the same volume on its own. The sum of all components’ partial pressures equals the total pressure of the mixture. Therefore, partial pressure can be lowered by lowering pressure generally (e.g., by lowering temperatures or increasing volume) or altering the ratio of gases in the mixture.

As noted in the NPRM, PHMSA has conducted a technical review of this petition and concludes in this final rule that it agrees with CGA that when the gas is in a mixture, it can be manipulated to be entirely gaseous at its intended use temperature of 20°C (68°F) by reducing the components’ partial pressures. PHMSA notes that during transportation, the gas mixture or its components may partially liquefy, forming condensation on the container wall, if ambient temperatures are lower than 20°C (68°F), but still above -50°C (-58°F). When the mixture returns to its use temperature, the condensation will transform back to the gaseous state. There are scenarios where a gas mixture might contain a component that meets the definition of a liquefied compressed gas, and under small temperature changes, a cloud or condensation could build up inside the cylinder. This could lead to the “liquefied compressed gas” description potentially misrepresenting the cylinder’s contents to first responders and end users. Moreover, while CGA does not cite a safety concern with the current requirements under the HMR, they do note that there can be confusion among stakeholders when the content of a cylinder is described as a

liquefied compressed gas, but resembles a non-liquefied compressed gas during transportation and use. Thus, PHMSA has determined that this revision is safety neutral or slightly improves safety. However, PHMSA disagrees with the CGA petition to use a special provision to allow for the description of a gas mixture with components that meet the definition of liquefied compressed gas to be described as a “compressed gas.” Instead, PHMSA believes that the most appropriate change is to amend the definition of a non-liquefied compressed gas in § 173.115(e), as revising the regulatory text provides a clearer connection for all stakeholders who ship these gases.

This revision to the HMR will not result in any cost to industry or impose any regulatory burden on small businesses. Given that industries already must describe shipments of these materials on a shipping paper, and communicate information about the material and the hazard on the package, there will be little to no cost on entities to change the hazard communication. A more detailed discussion of this economic analysis of this revision can be found in the RIA posted to the docket for this rulemaking.

PHMSA received comments from CGA in support of the revisions as proposed. PHMSA did not receive any comments in opposition to the proposed revision. Therefore, PHMSA revises the HMR to allow certain mixtures of gas with component(s) considered liquefied gas, in accordance with § 173.115(e), to be described as a “compressed gas” and considered a non-liquefied gas, in accordance with § 173.115(d). PHMSA revises § 173.115(e) to clarify that gas mixtures with component(s) considered liquefied gases may be described using the appropriate hazardous materials description of a non-liquefied compressed gas in the HMT in § 172.101 when the partial pressure(s) of the liquefied gas component(s) in the mixture are reduced so that the mixture is entirely in the gas phase at 20°C (68°F).

H. Incorporate by reference CGA C-23 (2018)

In its petition (P-1729),²² CGA requested that PHMSA incorporate by reference CGA C-23 (2018), “Standard for Inspection of DOT/TC 3 series and ISO 11120 Tube Neck Mounting Surfaces, Second Edition,” into § 171.7 of the HMR. CGA also requested that PHMSA revise §§ 180.205 and 180.207 to reference the requirements in CGA C-23. CGA C-23 defines a tube as a seamless pressure vessel authorized for transportation only when horizontally mounted on a motor vehicle or in an ISO framework. Tube modules are also commonly known as skid containers, ISO skids, ISO containers, or MEGCs. Sections 180.205 and 180.207 outline the general requirements for the requalification of specification cylinders and UN pressure receptacles. The CGA petition would require all requalifiers of tube trailers, skid containers, or MEGCs to periodically disassemble equipment and perform an examination of tube neck mounting surfaces, in accordance with CGA C-23. In the NPRM, PHMSA proposed to incorporate by reference CGA C-23 (2018), “Standard for Inspection of DOT/TC 3 series and ISO 11120 Tube Neck Mounting Surfaces, Second Edition,” into § 171.7 and revise §§ 180.205 and 180.207 to reference the requirements in CGA C-23.

PHMSA noted in the NPRM that these tubes are typically mounted to a semitrailer by engaging the threaded surface on either end of the tube with flanges built into the bulkheads located on opposing ends of the trailer. Although secured in place, these mounting points support the full weight of the tube and, during transportation, are subjected to jostling, temperature changes, and all the dynamic forces associated with the acceleration/deceleration of the transport vehicle. Consequently, the constant motion and wear between the tube’s threaded mounting surfaces and the flanges causes, over time, the deterioration of the mounting threads. This deterioration necessitates the periodic disassembly of the tubes from the trailer to inspect them. Therefore, CGA C-23 provides instructions on how to inspect and evaluate DOT/TC 3-Series and ISO 11120 tubes that are 12 feet (3.7 m) or longer; have an outside diameter greater than or

²² P-1729 – CGA (PHMSA-2019-0059), <https://www.regulations.gov/docket/PHMSA-2019-0059>.

equal to 18 inches (457 mm); and are supported by a neck mounting surface. In addition, CGA C-23 provides methods to assess the integrity of tube necks, including but not limited to, damage to mounting threads or to pin or set screw marks, as well as other damage. The assessment as outlined in C-23 provides a method for the identification of rejected tubes so that they can be removed from service, thereby improving the safe transportation of these horizontally mounted cylinder types.

The NPRM also noted that CGA C-23 was developed in response to an incident where a DOT specification 3AAX cylinder was ejected from a semitrailer and ruptured upon initial impact with the roadway. CGA determined that the root cause of the ejection, which contributed to the severity of the incident, was the condition of the connection between the tube neck and flange. CGA asserts that CGA C-23 will enhance the inspection process to include the inspection of the tube mounting and replacement of flanges.

The HMR currently do not reference CGA C-23, but PHMSA references the standard as a safety control in DOT special permits, such as DOT SP-14206.²³ These special permits allow for the requalification of DOT specification cylinders and UN tubes by UE or acoustic emission testing (AET), with a follow-up UE, instead of the hydrostatic test currently required under the HMR. These methods are used to ensure the cylinders and tubes remain qualified for hazardous materials service. Moreover, the UE and AET methods are non-destructive methods of examination and are alternatives to the hydrostatic method. Additionally, the HMR do not require periodic inspection and evaluation of the tube neck mounting surfaces. The CGA petition would enhance transportation safety of these larger cylinders and tubes by including inspection of the tube mounting threads as part of the requalification process.

The language recommended by CGA would require both specification DOT 3-series and UN tubes that are 12 feet or longer, with an outside diameter greater than or equal to 18 inches

²³ DOT SP-14206, <https://www.phmsa.dot.gov/approvals-and-permits/hazmat/file-serve/offer/SP14206.pdf/offerserver/SP14206>.

and supported by the neck mounting surface during transportation in commerce, to be inspected at least every 10 years in accordance with CGA C-23. CGA also proposes new language in §§ 180.205(d) and 180.207(d) to require DOT 3-series and UN tubes that show evidence of corrosion to the neck threads to be removed and examined in accordance with CGA C-23 before being rejected or returned to service. As noted in the NPRM, PHMSA conducted a technical review of the CGA petition and determined that the incorporation by reference of CGA C-23 will enhance safety by implementing a periodic inspection of the mounting of these tubes. Moreover, the requirements of CGA C-23 are consistent with the safety controls referenced in DOT-SP 14206. There are also improvements offered by the CGA C-23 standard versus the procedures outlined in DOT-SP 14206, such as a table that contains specific dimensional values for use in defining acceptance criteria for tubes with local thin areas (LTA). However, PHMSA noted in the NPRM that it had found the CGA proposals in §§ 180.205(d)(5) and 180.207(d)(1)(iii) requiring the disassembly of the tube module when visible corrosion in the neck region is present to be too vague. Therefore, PHMSA references the figures and descriptions provided in Section 4.2 of the CGA C-23 standard for extreme neck thread wear conditions in §§ 180.205(d)(5) and 180.207(d)(1)(iii) to clarify conditions when disassembly of the tube module is required.

PHMSA has determined that incorporating by reference CGA C-23 into the HMR will enhance safety for industry and stakeholders by codifying the tube neck thread inspection procedures. PHMSA estimates there will be a one-time cost for industry participants to purchase the CGA C-23 standard. With respect to inspections, there may be some minimal administrative costs associated with special permit holders' permits to reflect the codification of CGA C-23-2018 into the code, but these special permit holders should have been following the requirements of CGA C-23-2018 already. A more detailed discussion of this economic analysis of this revision can be found in the RIA posted to the docket for this rulemaking.

PHMSA received comments from CGA in support of these revisions as proposed. PHMSA did not receive any comments in opposition to the proposed revision. Therefore,

PHMSA revises § 171.7 to incorporate by reference CGA C-23, “Standard for Inspection of DOT/TC 3-Series and ISO 11120 Tube Neck Mounting Surfaces, 2nd Edition.” PHMSA also adds § 180.205(c)(5) to state that DOT 3-series cylinders horizontally mounted on a motor vehicle or in a framework, and longer than 12 feet, shall be inspected in accordance with CGA C-23 every 10 years; and adds § 180.205(d)(5) to specify conditions (as outlined in Section 4 of CGA C-23) requiring removal and inspection in accordance with CGA C-23. The current § 180.205(d)(5) requiring testing and inspection if the Associate Administrator determines that the cylinder may be in an unsafe condition is renumbered as paragraph (d)(6). PHMSA also revises § 180.205(i)(2)(i)(C) to state that the requalifier must stamp the cylinder “CONDEMNED” and affix a readily visible label on the cylinder stating “UN REJECTED, RETURNING TO ORIGIN FOR PROPER DISPOSITION” for a condemned cylinder that contains hazardous materials. The requalifier may only transport the condemned cylinder by private motor vehicle carriage to a facility capable of safely removing the contents of the cylinder. Finally, PHMSA adds § 180.207(d)(1)(ii) to state that steel UN tubes horizontally mounted on a motor vehicle or in a framework, and longer than 12 feet, shall be inspected in accordance with CGA C-23 every 10 years; and to specify conditions (as outlined in Section 4 of CGA C-23) requiring removal and inspection in accordance with Section 6 of CGA C-23. The text at the current § 180.207(d)(1) is renumbered as paragraph (d)(1)(i).

Lastly, PHMSA notes that the NPRM proposed language in § 180.205(c) regarding the grace period allowed for neck thread inspections with respect to requalification times. However, PHMSA asserts that this proposed language is redundant with the language already incorporated by reference in CGA C-23, Section 4, and thus not needed as this text would be duplicative.

I. Incorporate by reference IME Safety Library Publication 23 (SLP-23)

In its petition (P-1731),²⁴ the IME proposes that PHMSA incorporate by reference an updated version of IME SLP-23 (2021), titled “Recommendations for the Transportation of Explosives, Division 1.5; Ammonium Nitrate Emulsions, Division 5.1; and Combustible Liquids in Bulk Packaging.” IME states that these revisions and improvements to the standard reflect technological advances and best practices in the industry that will maintain a high level of safety. In the NPRM, PHMSA proposed to incorporate by reference IME SLP-23 (2021) into § 171.7.

SLP-23 (2021) outlines the requirements for transporting certain explosives and ammonium nitrate emulsions, classified as oxidizers, to ensure their safe and efficient transport in bulk packagings by highway, vessel, and rail. These bulk packagings can either be DOT specification or non-DOT specification packagings (e.g., cargo tanks or portable tanks) adapted to accommodate the physical and chemical properties of the bulk explosives, oxidizers, or fuel oil transported. SLP-23 (2021) makes several non-substantive changes and editorial clarifications from the previous publication. Non-substantive changes include changing the structure of SLP-23 to read more consistently with the HMR and editorial revisions.

Substantive changes to SLP-23 (2021) include:

- Deletion of the Vented Pipe Test (VPT) in Appendix A

Currently, SLP-23 (2011) requires both bulk Division 1.5 explosives and Division 5.1 ammonium nitrate emulsions to pass the VPT. The updated SLP-23 removes the VPT test for these materials. IME asserts that the VPT is not applicable to Division 5.1 and Division 1.5 materials and adds that, as outlined in portable tank instruction TP 32 (applicable to UN0331, UN0332, and UN3377 materials), the VPT is required only to demonstrate suitability for containment in tanks as an oxidizer for ammonium nitrate-based emulsions (ANEs) classified as Division 5.1, UN3375. Additionally, IME notes that a significant change to the requirements applicable to the testing of ANEs was approved by the UN Sub-Committee of Experts on the

²⁴ P-1731 – IME (PHMSA-2019-0062), <https://www.regulations.gov/docket/PHMSA-2019-0062>.

Transport of Dangerous Goods at its 54th Session (Nov/Dec 2018). Under the new testing regime, acceptance criteria will require passing either test series 8(a), 8(b), and 8(c), or if the substance fails the 8(c) test (i.e., the “Koenen Test”) and the substance had a time to reaction in that test longer than 60 seconds and a water content greater than 14 percent, the material would be required to pass test series 8(a), 8(b), and 8(e). Test 8(e) is the Minimum Burning Pressure test (MBP). IME noted that industry is currently gathering data to determine whether use of the MBP test obviates the need for the VPT because, in essence, the VPT is a scaled-up Koenen Test and, therefore, has the same limitations associated with extended time of heating.

- Allowing operators to continually monitor driver qualifications and training instead of conducting an annual audit, as currently required in SLP-23 (2011).

IME notes that the current requirement for an “annual audit” is inadequate to ensure that driver qualification and training programs are comprehensive, effective, and being implemented properly. IME believes that limiting oversight of the program to an annual audit provides less assurance that operators are compliant than would a requirement to continually monitor the driver qualification program.

In addition, IME requests revisions to the HMR that coincide with the incorporation by reference of SLP-23 (2021). IME requests the adoption of DOT-SP 8723, which authorizes “UN0332, Explosive, Blasting, type E,” “UN3375, Ammonium nitrate emulsion,” and “UN3139, Oxidizing liquid n.o.s. (PG II)” to be transported in IM 101 and 102 portable tanks. IME explains that continuing to operate under DOT-SP 8723 imposes additional administrative costs to both industry and PHMSA, and that one of the advantages of incorporating by reference SLP-23 (2011) into the HMR was the elimination of SPs governing bulk transportation of certain materials manufactured and used by the commercial explosives industry. IME asserts that failure to include the provisions from DOT-SP 8723 was an oversight when SLP-23 (2011) was originally incorporated by reference into the HMR. In addition to the administrative cost savings noted above, IME adds that the conversion of SPs into regulations provides certainty to the

regulated community, and increases transparency for government, stakeholders, and the public. IME proposes that TP codes be assigned to “UN0332, Explosive, blasting, type E,” “UN3375, Ammonium nitrate emulsion,” and “UN3139, Oxidizing liquid, n.o.s., PG II” to authorize the use of IM 101 and 102 portable tanks when transported under SLP-23 (2021). Lastly, IME proposes a revision to § 173.251 to state that this section is not applicable when UN3375 is transported in IM 101 or 102 portable tanks in accordance with SLP-23 (2021).

As noted in the NPRM, PHMSA conducted a technical review of the revisions to SLP-23 (2021) and concurs with IME that most of the changes in IME SLP-23 (2021) are either non-substantive or editorial in nature. PHMSA does not believe, however, that sufficient data was provided by IME to no longer require the VPT for Division 1.5 blasting explosives and Division 5.1 ANEs when transported in bulk. While it is true that the UN Subcommittee has discussed whether the VPT is beneficial for ANEs when transported in bulk, the discussions are still in preliminary stages and pending further review by the UN Subcommittee. If these provisions are adopted by the UN, PHMSA may consider changes to VPT requirements in a future international harmonization rulemaking, but PHMSA declines to incorporate that revision at this time.

PHMSA also concurs with IME that an annual audit is inadequate to ensure that driver qualification and training programs are comprehensive, effective, and being implemented properly. A continual monitoring program better ensures compliance with the driver qualification requirements. While the timing of the oversight of requirements would change—i.e., continuous monitoring instead of an annual audit—the current elements of the qualification and training program would remain unchanged.

Lastly, PHMSA concurs that there is sufficient merit to adopt the provisions of DOT-SP 8723 to authorize “UN0332, Explosive, blasting, type E,” “UN3375, Ammonium nitrate emulsion,” and “UN3139, Oxidizing liquid, n.o.s., PG II” to be transported in IM 101 and 102 portable tanks when shipped under SLP-23 (2021). This would include a conforming revision to indicate that § 173.251 does not apply when UN3375 material is transported in IM 101 or 102

portable tanks in accordance with SLP-23. PHMSA has determined that these revisions maintain the safety of bulk transport of these materials because the SLP-23 (2011) standard currently incorporated by reference already authorizes larger bulk quantities consistent with the hazardous material offered in accordance with DOT-SP 8723 and is supported by a safety record of use for 10 years.

PHMSA concludes that the revisions to IME SLP (2021) will streamline regulatory requirements without a negative impact on safety. PHMSA quantified the effects of removing the administrative requirements of applying for a special permit and estimates the average annual cost savings to be \$6,746 per year. There are several other effects of the proposal that may result in costs, cost savings, and benefits, but these results are less certain and are described qualitatively. A more detailed discussion of the economic analysis of this revision can be found in the RIA posted to the docket for this rulemaking.

IME provided comments mostly in support of the proposed incorporation of IME SLP-23 (2021). However, IME also provided comments on potential revisions to the applicability of IME SLP-23 (2021). IME notes that since the publication of SLP-23 (2021), PHMSA has authorized the use of UN T11 portable tanks in DOT-SP 8723²⁵ for “UN0332, Explosive, blasting, type E or Agent blasting, Type E”, “UN3375, Ammonium nitrate emulsion or Ammonium nitrate suspension or Ammonium nitrate gel, intermediate for blasting explosives” and “UN3139, Oxidizing liquid, N.O.S.” In its comments, IME request that the IME SLP-23 (2021) be revised to include the addition of T11 UN portable tanks for these materials.

IME also notes that the use of intermediate bulk containers (IBCs) is not expressly authorized under IME SLP-23 (2021) despite their historical use for the transportation of bulk explosives. IME adds that the HM-233D final rule,²⁶ titled “Hazardous Materials: Requirements for the Safe Transportation of Bulk Explosives,” incorporated by reference the IME SLP-23

²⁵ <https://www.phmsa.dot.gov/hazmat/documents/offer/SP8723.pdf/offerserver/SP8723>

²⁶ 80 FR 79423 (Dec. 21, 2015).

(2011), which in turn incorporated several DOT special permits authorizing the transportation of certain explosives in bulk containers. One such special permit, DOT-SP-11579,²⁷ authorized the transportation of blasting materials/ammonium nitrate emulsions in certain IBCs. IME SLP-23 (2021) specifically authorizes bulk packages for materials authorized under §§ 173.240 (UN0331 and NA0331) and 173.242 (UN0332 and UN3375). IME adds that both regulatory provisions limit the transportation of these materials in IBCs to materials for which the IBC type is authorized, according to the IBC packaging code, specified for the specific hazardous material in Column (7) of the HMT in § 172.101. Lastly, IME notes that there are no IBC packaging codes for NA0331, UN0331, and UN0332 in Column (7) of the HMT and, accordingly, their transportation in IBCs is currently prohibited. IME states that it was not their intention to exclude IBCs for these materials when the incorporation of SLP-23 (2011) was originally requested. IME also does not believe it was PHMSA's intent to exclude these materials for transportation in IBCs, since SP-11579 was expressly incorporated into the HMR as part of that incorporation action. IME requests that PHMSA either revise SLP-23 (2021) to state that the IBC code requirements in §§ 173.240 and 173.242 are inapplicable, or amend the HMT to include an IBC Code for the materials.

With respect to T11 UN portable tanks, PHMSA agrees that there is no technical reason to not include UN portable tanks for the transportation of bulk explosives under SLP-23 (2021). Additionally, PHMSA does not believe there is any technical reason to not allow the use of IBCs as requested in SLP-23(2021). However, the APA requires that the public have an opportunity to comment on regulations before they take effect, so any requirements not proposed in the earlier notice cannot be included in this final rule. PHMSA encourages IME to submit a petition for rulemaking to incorporate by reference a revised version of the SLP-23 publication with the revisions that would authorize these packages in a revised version of SLP-23. Until then, PHMSA encourages IME's members to continue to renew DOT SP-8723 for the use of UN

²⁷ https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/SP11579_2010010140.pdf.

portable tanks. Additionally, PHMSA encourages those entities wanting to transport NA0331, UN0331, and UN0332 in IBCs to apply for a special permit similar to what was allowed in DOT SP-11579.

IME also notes that Section I of IME SLP-23 (2021), titled “Standards for Transporting a Single Bulk Hazardous Material for Blasting by Cargo Tank Motor Vehicles,” contains a subsection G, which addresses the “Security and Safety of the Bulk Hazardous Materials Transported under the Provisions of IME SLP-23.” IME SLP (2021) Section II is titled “Standards for Cargo Tank Motor Vehicles Capable of Transporting Multiple Hazardous Materials for Blasting in Bulk and Non-Bulk Packaging.” IME notes that the safety and security requirements are only found in paragraph G of Section I and not Section II. IME adds that one could interpret the applicability of the safety and security provisions in paragraph G to Section I as only applying to CTMVs carrying a single bulk hazardous material. IME states that its intent was to apply safety and security precautions found in paragraph G of Section I to all CTMVs, regardless of whether they are carrying a single hazardous materials or multiple hazardous materials. Accordingly, IME recommends that Section II of SLP-23 be amended to include the same safety and security requirements found in Section I.

As previously stated, under the APA, PHMSA cannot incorporate by reference in the final rule a version of the IME SLP-23 other than the version proposed in the NPRM. The HMR already requires that certain hazardous materials shippers and carriers develop and implement security plans. Specifically, § 172.802 states that security plans must be developed and adhered to by shippers and carriers of certain hazardous materials in specified quantities, including Division 1.1, 1.2, or 1.3 explosives; spent nuclear fuel; highway route controlled quantities of radioactive materials; and more than 25 kg of Division 1.5, 1.3, or 1.1 explosives. Security plans must include an assessment of possible transportation security risks and appropriate measures to address those risks. Specific elements such as personnel security, unauthorized access, and en route security must be addressed.

The safety and security requirements, as outlined in paragraph G of Section 1 of SLP-23 (2021), act as guidance for how CTMVs used to transport bulk shipments of hazardous materials can comply with the regulatory requirements currently found in § 172.802. Although paragraph G is not currently listed in Section II of SLP-23 (2021) for CTMVs containing multiple hazardous materials, PHMSA believes it reasonable to clarify in the preamble to the final rule that the safety and security requirements found in paragraph G of Section 1 should also be applied to shipments of multiple hazardous materials in bulk, in order to comply with the requirements in § 172.802. PHMSA encourages IME to note on its website for downloading SLP-23 that the safety and security requirements found in paragraph G of Section I can also be used in Section II in order to meet the regulatory requirements in § 172.802. Additionally, IME is also encouraged to petition PHMSA to incorporate a new version of SLP-23 which makes the safety and security requirements clearer to the users of SLP-23.

Lastly, IME notes that the current title of Section I of IME SLP-23 (2021) is “Standards For Transporting A Single Bulk Hazardous Material for Blasting by Cargo Tank Motor Vehicles.” IME notes that a strict reading of the title implies that Section I is limited to bulk transport by cargo tank motor vehicle (CTMV). However, paragraph B of Section I specifically states that “highway, vessel, and rail are authorized modes for the transportation of the bulk hazardous materials listed in Section I.A.1 in bulk packagings.” In order to eliminate any confusion caused by this contradictory language, IME recommends that the title of Section I be modified to read “Standards for Transporting a Single Bulk Hazardous Material for Blasting.” In addition, IME requests that a revision be made to Special Provision 148 and § 173.66, which specifically reference the title of Section I of IME SLP-23 (2021).

As previously stated, under the APA, PHMSA cannot incorporate by reference in the final rule a version of the IME SLP-23 other than the version proposed in the NPRM. However, PHMSA is clarifying in the preamble to this final rule that since paragraph B of Section 1 clearly states that “highway, vessel, and rail are authorized modes for the transportation of the bulk

hazardous materials listed in Section I.A.1 in bulk packagings,” the transportation of bulk explosives under IME SLP-23 applies to the highway, vessel, and rail modes provided the shipment of such materials is approved by the relevant mode in the HMT. As previously stated, PHMSA encourages IME to submit a petition for rulemaking to revise the HMR and provide an updated version of IME SLP-23 that clarifies this issue further.

Therefore, PHMSA incorporates by reference SLP-23 (2021), “Recommendations for the Transportation of Explosives, Division 1.5; Ammonium Nitrate Emulsions, Division 5.1; and Combustible Liquids in Bulk Packaging,” as proposed into § 171.7(r)(2) and replaces the 2011 edition currently incorporated by reference in the HMR. PHMSA also revises special provision 148 to clearly state that the VPT requirements in SLP-23 (2011) would still apply. PHMSA also adds new special provision TP48 to § 172.102(c)(8) to authorize the use of IM 101 and 102 portable tanks for ANEs when transported under SLP-23 (2021). PHMSA assigns TP48 to the following UN numbers in the HMT in § 172.102: “UN0332, Explosive, blasting, type E;” “UN3375, Ammonium nitrate emulsion;” and “UN3139, Oxidizing liquid, n.o.s., PG II.” Lastly, PHMSA revises § 173.251 to state that this section is not applicable when “UN3375, Ammonium nitrate emulsion” is transported in IM 101 or 102 portable tanks in accordance with SLP-23 (2021).

J. Revision of testing and marking of UN specification packagings

In its petition (P-1732),²⁸ the Sporting Arms and Ammunition Manufacturers’ Institute, Inc. (SAAMI) proposes that PHMSA amend § 178.503(a)(6) by allowing UN performance-oriented boxes (e.g., UN 4A, 4B, or 4N for steel, aluminum, or other metal boxes, respectively) to be marked with the last two digits of the year of testing certification rather than the last two digits for year of manufacture. Additionally, the SAAMI petition proposes to add an additional selective testing variation in § 178.601(g) to allow for variation of packagings that include

²⁸ P-1732 – SAAMI (PHMSA-2019-0069), <https://www.regulations.gov/docket/PHMSA-2019-0069>.

articles containing solid hazardous materials, packed in inner packagings without further testing, subject to certain conditions. SAAMI requests that this variation also allow for an increase in dimensions of the outer packaging of the combination packaging based on the tested design type. In the NPRM, PHMSA proposed to revise § 178.503(a)(6) to allow UN performance-oriented boxes (e.g., UN 4A, 4B, or 4N for steel, aluminum, or other metal boxes, respectively) to be marked with the last two digits of the year of testing certification rather than the last two digits for year of manufacture, and revise § 178.601(g) to allow an additional selective testing variation.

With regard to the marking proposal, the marking requirements in § 178.503(a)(6) currently require packages to be marked with the last two digits of the year of manufacture. SAAMI asserts that the year of manufacture is meant to tie the packaging to a specific certification (i.e., tied to design qualification testing and periodic retesting to a UN standard). SAAMI asserts that while the date of manufacture is informative, this degree of specificity is not necessary for safety or enforcement purposes. SAAMI adds that because the retesting of the design type occurs every two years,²⁹ industries incur costs to change the year of manufacture marking on packagings that are still being produced under the same design test. (PHMSA notes that this conclusion is based on the presumption that manufacturers of combination packagings are operating at the minimum test frequency of retesting every 24 months.) SAAMI asserts that allowing marking of the last two digits of the year of packaging certification on packagings is considered an acceptable substitute to the current regulatory requirement in § 178.503(a)(6) and eliminates the need to change printing plates biannually.

PHMSA received mixed comments regarding this specific proposal; specifically, some commenters supported it while others opposed. The opposing viewpoint noted that this proposal would cause the package marking on Series 4 Packages to no longer be harmonized with the UN

²⁹ The periodic retest requirements for combination packagings call for conducting design qualification retesting at least once every 24 months. *See* § 178.601(e).

Model Regulations. Therefore, PHMSA is not adopting the proposal to revise § 178.503(a)(6) to allow the marking of Series 4 packages with the year of certification instead of the year of manufacturing. PHMSA has determined that the HMR and the UN Model Regulations packaging specification marks should remain aligned to facilitate efficient cross-border shipping.

Deviations from the UN Model Regulations—particularly with respect to standard markings—is not justified based on limited potential cost savings that could be at issue here. Maintaining a global system of consistent transportation requirements protects businesses and people worldwide by allowing for the safe, frustration-free transport of hazardous materials.

With regard to the selective testing variation proposal, § 178.601 contains the general requirements for the testing of non-bulk UN performance-oriented packagings and packages. Section 178.601(g) contains packaging variations that allow for the selective testing of packagings that differ only in minor respects from a tested design type. SAAMI proposes in its petition to create an additional packaging variation under § 178.601(g) to include small arms ammunition—specifically, “Cartridges for weapons, inert projectile(s) or blank (UN0012 and UN0014); Primers, cap type (UN0044); and Cases, cartridge, empty with primer (UN0055)—packed in inner packages.” Specifically, SAAMI proposes allowing inner packagings of ammunition to be assembled and transported without packaging testing, provided that the outer packaging of a combination package of articles successfully passes the tests, in accordance with §§ 178.603 and 178.606. Additionally, the SAAMI petition proposes for the packaging variation to allow for larger packages to use the certification of a smaller tested package.

As noted in the NPRM, PHMSA conducted a technical review of the SAAMI proposal for a new selective testing variation to allow for limited testing of combination packagings for small arms ammunition and components. PHMSA concurs with the proposal to allow for a variation in combination packagings used for materials classified as UN0012, UN0014, UN0044, and UN0055 without further testing.

PHMSA conducted an economic evaluation of the amendment to § 178.601(g) to allow specified inner packagings to be assembled and transported without testing under certain conditions. For this amendment, PHMSA estimates annualized cost savings of approximately \$826,711. A more detailed discussion of the economic analysis of this amendment can be found in the RIA posted to the docket for this rulemaking.

PHMSA received comments from COSTHA in support of the revisions as proposed. PHMSA did not receive any comments in opposition to the proposed revision. Therefore, PHMSA is adding a new packaging variation in § 178.601(g)(6) to authorize selective testing of packagings containing “Cartridges for weapons, inert projectile(s) or blank (UN0012 and UN0014), Primers, cap type (UN0044), and Cases, cartridge, empty with primer (UN0055).” Inner packagings intended to contain these materials may be assembled and transported without testing provided that the outer packaging of a combination packaging successfully passes the tests, in accordance with §§ 178.603 and 178.606, and the gross mass does not exceed that of the tested type.

K. Authorizing smaller combustible placard on IBCs

In its petition (P-1734),³⁰ Evonik proposes that PHMSA revise § 172.514(c) by adding an option for smaller placards for intermediate bulk containers (IBCs) carrying combustible liquids by adopting the provisions in DOT-SP 16295³¹ into the HMR. This would allow shippers to transport IBCs containing combustible liquids (NA1993) bearing a combustible placard sized to be consistent with the label size specifications in § 172.407(c). Section 172.407(c) requires diamond shaped labels to be at least 100 mm (3.9 inches) on each side. In the NPRM, PHMSA proposed to revise § 172.514(c) by adding an option for smaller placards for IBCs carrying combustible liquids.

³⁰ P-1734 – Evonik (PHMSA-2019-0089), <https://www.regulations.gov/docket/PHMSA-2019-0089>.

³¹ DOT SP-16295, <https://cms7.phmsa.dot.gov/approvals-and-permits/hazmat/file-serve/offer/SP16295.pdf/2018080498/SP16295>.

The HMR requires placards to be at least 250 mm (9.84 inches) on each side. Section 172.514(c) prescribes the exceptions for placarding bulk packages. Specifically, paragraph (c)(4) authorizes IBCs to be labeled in accordance with part 172, subpart E. However, IBCs transporting combustible liquids do not qualify for that exception because there is no authorized label for combustible liquids.

Evonik states in its petition that a smaller-sized combustible placard would allow for more space for proper placarding and marking placement due to the commonly limited space available to display hazard information on the IBC side plates and panels. Moreover, Evonik states that a smaller placard provides a level of safety equivalent to the requirements in § 172.514(c)(4), where an IBC is authorized to be labeled instead of placarded (e.g., flammable labels vs. flammable placards), and in § 172.406(e)(6), where duplicate labels are not required on two sides or two ends of an IBC with a volume of 1.8 m³ (64 cubic feet) or less (approximately 478 gallons). Because these exceptions are allowed for hazardous materials considered to pose greater danger than combustible liquids, Evonik asserts the reduction in size for combustible placards will maintain a safe level of hazard communication for transport of combustible liquids in IBCs.

While this revision is not technical in nature, PHMSA determines that—from a policy and safety perspective—this amendment does not change the safety requirements for the transportation of an IBC, but will provide greater flexibility by making more space available for other necessary information on the IBC. Additionally, this amendment will not result in any cost to industry or impose any new regulatory burden to industry. There will be a marginal cost savings due to current special permit holders no longer needing to apply to renew their special permits. A more detailed discussion of this economic analysis of this revision can be found in the RIA posted to the docket for this rulemaking.

PHMSA received feedback from the DGAC supporting proposed changes to allow label sized placards on IBCs containing combustible liquids instead of requiring full sized placards. In

its original proposal, PHMSA asked for comments on whether to allow label sized placards instead of full sized placards on other bulk package types containing combustible liquids, such as portable tanks. DGAC recommended that PHMSA expand the changes to also include permitting label sized placards instead of full sized placards on portable tanks for combustible liquids. After further review, PHMSA did not find any technical or safety reasons to not allow the use of label sized placards instead of full sized placards on portable tanks. Therefore, PHMSA revises § 172.514(c)(1) and (4) to allow IBCs and portable tanks containing combustible liquids to be placarded with a combustible placard that meets the label size specifications in § 172.407(c).

L. Incorporate by reference IME Safety Library Publication 22 (SLP-22)

In its petition (P-1736),³² IME requests that PHMSA incorporate by reference IME SLP-22 (2019), “Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials.” The HMR currently incorporates by reference the IME SLP-22 (2007) version in the HMR at § 171.7(r)(1). In the NPRM, PHMSA proposed the incorporation by reference of IME SLP-22 (2019), “Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials.”

IME notes that DOT has long accepted the SLP-22 publication and its recommendations for the safe transportation of detonators in a vehicle. SLP-22 (2007) is referenced in §§ 173.63 and 177.835. IME notes that much of the SLP-22 standard has remained virtually unchanged since 1972 and has proven effective for the safe transportation of detonators. Of the millions of shipments of detonators and explosives made using SLP-22, none have resulted in a mass-detonation. The primary intent of SLP-22 is not to prevent mass detonation, but instead to allow sufficient time in the event of a transportation incident, such as fire, to evacuate bystanders to a safe distance. Testing conducted by IME has shown that transporting detonators in an

³² P-1736 – IME (PHMSA-2019-0167), <https://www.regulations.gov/docket/PHMSA-2019-0167>.

undamaged box constructed to the standard set forth in SLP-22 will prevent, for 30 minutes or longer, mass detonation.

SLP-22 (2019) reflects necessary changes and improvements to the SLP-22 (2007) edition and includes technical corrections, practical improvements, and deletion of outdated practices.

Specifically, changes to SLP-22 include:

- Providing clarity on the text “other positions may be acceptable” by specifying alternative placement of SLP-22 packages or containers on a motor vehicle based on vehicle cargo space configuration.
- Consistent with the alternative positions, adding a constraint to limit positions of a container on the vehicle as far as possible from the points on the vehicle that are most susceptible to high temperature fires due to accidents or severe mechanical failures (e.g., the vehicle fuel tank).
- Adding reference to IME SLP-23 for containers mounted on a cargo tank motor vehicle.
- Adding a requirement that structural components (i.e., latches) must be bolted or welded to the steel in the wall of the container or compartment.
- Allowing alternative materials of construction subject to certain performance standards (i.e., constructed of or covered with non-sparking material).
- Adopting several revisions that provide clarity and correct typographical errors.

As noted in the NPRM, PHMSA conducted a technical review of each revision included in SLP-22 (2019) and concluded that these changes will either maintain or enhance the safety of transporting detonators by highway with other explosive materials. PHMSA supports the overall intent to allow more time for evacuation should there be an incident. PHMSA incorporates by reference SLP-22 (2019). PHMSA has concluded that the specifications in Section C.9 of the document are adequate to provide the flexibility to allow for alternative materials of construction without compromising safety.

As noted in the NPRM, PHMSA conducted an economic analysis of the IME proposal and found that the changes made to Sections C.1 and C.1.a provide more flexibility for businesses in their placement of SLP-22 boxes while still meeting safety standards. The changes to Section C.1.c regarding padlocks may result in annual cost savings of approximately \$2,000, assuming a small percentage of vehicles (0.1 percent) take advantage of the one-time cost savings associated with purchasing new padlocks. C.9's allowance of alternative materials in the construction of SLP-22 boxes may result in cost savings of approximately \$965,598 per year. These cost savings, however, are contingent on the quantity and type of material substitutions made by SLP-22 box manufacturers, which is uncertain. A more detailed discussion of this economic analysis of this incorporation by reference can be found in the RIA posted to the docket for the rulemaking.

PHMSA received comments from IME in support of these revisions as proposed. PHMSA did not receive any comments in opposition to the proposed revision. Therefore, PHMSA amends § 171.7(r)(1) to reference IME SLP-22 (2019). In addition, PHMSA makes an editorial revision to § 171.7(r)(1) by inserting a space between "IME Standard 22," and "IME" in the first line and amend the date to read "June 2019."

M. Definition of a liquid

In its petition (P-1738),³³ COSTHA proposes that PHMSA modify the definition of a liquid in § 171.8 to include the test for determining fluidity found in ISO 2137:1985, "Petroleum products—Lubricating grease and petrolatum—Determination of cone penetration," (penetrometer test), prescribed in section 2.3.4 of Annex A of the ADR. Section 171.8 states that a liquid means a material, other than an elevated temperature material, with a melting point or initial melting point of 20 °C (68 °F) or lower at a standard pressure of 101.3 kPa (14.7 pounds per square inch). A viscous material for which a specific melting point cannot be determined

³³ P-1738 – COSTHA (PHMSA-2019-0233), <https://www.regulations.gov/docket/PHMSA-2019-0233>.

must be subjected to the procedures specified in ASTM D 4359 (1990), “Standard Test Method for Determining Whether a Material is Liquid or Solid.” The UN Model Regulations, ICAO Technical Instructions, and IMDG Code all include the penetrometer test as an alternative to performing the ASTM D 4359 test method in determination of whether a material is a liquid. In the NPRM, PHMSA proposed to modify the definition of a liquid in § 171.8 to include the test for determining fluidity—ISO 2137:1985 (penetrometer test)—prescribed in section 2.3.4 of Annex A of the ADR.

In its petition, COSTHA states there have been no recorded instances of determination of liquidity using the ADR penetrometer test increasing the risk to safety while in transportation. COSTHA adds that under the current system, a material manufactured outside the United States and classified using the penetrometer test may not be reshipped within the United States without first performing the ASTM D 4359 test method. The HMR does not authorize the ADR penetrometer test as a method for determining if a material is a liquid, and thus, any hazard classification based on this result is not valid in the United States. This results in increased cost for shippers to conduct additional testing and creates a barrier to importing materials into the United States.

As noted in the NPRM, PHMSA conducted a technical review of the COSTHA proposal to harmonize the HMR definition with international use of the ADR penetrometer test for determination of a liquid. The test, ISO 2137:1985, as identified in the ADR under section 2.3.4, is referenced in the UN Model Regulations Volume 1, 20th edition, in section 1.2.1, Definitions, Liquid, and in the UN Manual of Tests and Criteria, 7th edition, as a footnote reference to UN Model Regulations 1.2.1 at the end of 20.4.1.5. PHMSA finds that the ISO test is more empirical in nature than ASTM D 4359 and provides better understanding of the physical properties of the tested material. Therefore, PHMSA now determines the adoption of penetrometer test into the HMR will provide a level of safety equal or greater to the currently approved ASTM test method. Lastly, the addition of the penetrometer test into the HMR will allow for more flexibility

to offerors by providing an additional option for the testing of liquids. An economic analysis of this petition could not validate the estimates from the petitioner that suggest cost savings from this revision. A more detailed discussion of this economic analysis of this revision can be found in the RIA posted to the docket for this rulemaking.

PHMSA received comments from COSTHA and DGAC in support of the revisions as proposed. PHMSA did not receive any comments in opposition to the proposed revision. Therefore, PHMSA revises the definition of a liquid in § 171.8 to reference the test for determining fluidity (penetrometer test) prescribed in section 2.3.4 of Annex A of the ADR.

N. Incorporate by reference updated CGA C-7 (2020)

In its petition (P-1744),³⁴ CGA proposes that PHMSA incorporate by reference the updated Appendix A of CGA publication C-7 (2020), “Guide to Classification and Labeling of Compressed Gases,” Eleventh Edition, into the HMR at § 171.7(n)(8). Currently, the HMR incorporates by reference CGA C-7 (2014), “Guide to Classification and Labeling of Compressed Gases,” Tenth Edition. The HMR currently authorizes the marking of a Dewar flask or a cylinder in accordance with CGA C-7 (2014), Appendix A instead of labeling (*see* § 172.400a). CGA states that an update is needed to CGA C-7, Tenth Edition (2014), to address changes made to Appendix A in the Eleventh Edition (2020), such as:

- Providing greater flexibility in the hazard class display by allowing it to be displayed on one or two lines.
- Clarifying that the marking system elements must meet certain minimum size requirements.
- Providing an example of the CGA marking system for multiple hazard diamonds that are overlapped.

³⁴ P-1744 – CGA (PHMSA-2020-0104), <https://www.regulations.gov/docket/PHMSA-2020-0104>.

CGA C-7 (2020) states the general principles for labels and markings of cylinders, and provides recommended minimum requirements for many hazardous gases and selected liquids used in such cylinders. In the NPRM, PHMSA proposed to incorporate by reference the updated Appendix A of CGA publication C-7 (2020), “Guide to Classification and Labeling of Compressed Gases,” Eleventh Edition, into the HMR at § 171.7(n)(8).

As noted in the NPRM, PHMSA conducted a technical review of this petition, including a review of the revised Appendix A to C-7 (2020), and found that the changes are minor and primarily editorial clarifications. PHMSA concludes that these editorial revisions in Appendix A to CGA C-7 (2020) will not negatively impact hazard communication.

As noted in the NPRM, PHMSA conducted an economic review of this petition and found no quantifiable benefits associated with this change. However, the changes found in Appendix A to CGA C-7 (2020) will provide clearer guidance to the regulated community and thus increase compliance. A more detailed discussion of this economic analysis of this revision can be found in the RIA posted to the docket for this rulemaking.

PHMSA received comments in support of the revisions as proposed from CGA and DGAC. PHMSA did not receive any comments in opposition to the proposed revision. Therefore, PHMSA revises § 171.7(n)(8) to reference CGA C-7 (2020), “Guide to Classification and Labeling of Compressed Gases,” Eleventh Edition.

O. Incorporate by reference CGA C-27 (2019)

In its petition (P-1746),³⁵ CGA proposes that PHMSA incorporate by reference CGA C-27 (2019), “Standard Procedure to Derate the Service Pressure of DOT 3-Series Seamless Steel Tubes,” First Edition. PHMSA notes that this publication defines “tube” as a seamless steel pressure vessel with openings at both ends and with a water capacity of 120 L or greater. CGA requests PHMSA revise § 180.212(a)(1) to allow for repairs of a seamless steel DOT 3-series

³⁵ P-1746 – CGA (PHMSA-2020-0116), <https://www.regulations.gov/docket/PHMSA-2020-0116>.

cylinder at a repair facility that holds a valid “K” number approval, issued under the provisions in § 107.805. Cylinder owners would be permitted to apply to reduce the service pressure of cylinders in accordance with CGA C-27. Approved facilities would then process these applications to determine if a DOT 3-Series cylinder rejected for insufficient minimum wall thickness could be derated from the original marked service pressure. In the NPRM, PHMSA proposed to incorporate by reference CGA C-27 (2019), “Standard Procedure to Derate the Service Pressure of DOT 3-Series Seamless Steel Tubes,” First Edition.

CGA C-27 provides a standard procedure to derate the service pressure of DOT 3-series seamless steel tubes with local thin areas in the walls of the tube that do not meet the minimum thickness criteria of the specification. Derating is the lowering of the maximum allowable service pressure of a cylinder due to thinning of a cylinder’s walls to extend the life of the cylinder. In accordance with CGA C-27, any tube with a suspect thin area found during AET, UE, or visual inspection must be evaluated in accordance with CGA C-20. If the tube does not meet the minimum thickness requirements in Section 4b of CGA C-27, a cylinder owner may apply to PHMSA to reduce the marked service pressure of the cylinders, in accordance with Section 4c of CGA C-27. The procedure to derate a tube must be performed by a DOT-approved repair facility. CGA C-27 does not apply to tubes that have been condemned from any requalification method. Cylinder repair shops must be approved by PHMSA to have the authority to repair a cylinder. These companies receive a K-number from PHMSA, and the K-number approval indicates whether a company is authorized to perform repairs or rebuilds of cylinders, and in this case, DOT 3-series tubes.

CGA asserts that the incorporation by reference of CGA C-27 will minimize inquiries to PHMSA by standardizing and codifying the existing process under the PHMSA document “Guidance for Applications to Down-Rate the Service Pressure of DOT Seamless Steel

Cylinders (Rev. 3/27/13),”³⁶ and provide persons seeking to derate a tube with instruction on pertinent information to submit to PHMSA in a logical and consistent manner.

As noted in the NPRM, PHMSA conducted a technical review of the proposals in the petition, including a review of CGA C-27, and found that the method for pressure derating of tubes is essentially the same as what is outlined in the PHMSA guidance document. Both documents provide instructions on how persons should conduct an initial inspection using CGA C-6 (2013), “Standard for Visual Inspection of Steel Compressed Gas Cylinders,” to establish that the tube is in good physical, serviceable condition for pressure derating with no rejectable corrosion, pitting, dents, gouges, or other defects. If deemed suitable for pressure derating, the tube should undergo 100 percent ultrasonic testing (UT) to establish a minimum sidewall thickness on which to base the new reduced service pressure. The methodology used to calculate the new service pressure is the same as the current methodology used to determine the allowable service pressure for DOT 3-series seamless steel cylinders found in the HMR at §§ 178.36 (3A and 3AX), 178.37 (3AA and 3AAX), and 178.38 (3B). The calculations should then be certified by the tube manufacturer, or by the Independent Inspection Agency (IIA) if the tube manufacturer is no longer in service or available. IIAs are approved by the Associate Administrator to perform a review of a company’s inspection or requalification operation. In summary, the PHMSA technical review found that the procedures in CGA C-27 are equivalent to the procedure established in the PHMSA guidance document for pressure derating of tubes and should have no impact on safety.

As noted in the NPRM, PHMSA conducted an economic evaluation of this petition and found that no benefits or additional costs other than the cost to obtain the publication are expected as a result of the changes in this petition. A more detailed discussion of this economic analysis of this revision can be found in the RIA posted to the docket for this rulemaking.

³⁶ <https://www.regulations.gov/document/PHMSA-2020-0116-0003>.

PHMSA received comments in support of the revisions from CGA. PHMSA did not receive any comments in opposition to the proposed revision. Therefore, PHMSA incorporates by reference CGA C-27, “Procedure to Derate the Service Pressure of DOT 3-Series Seamless Steel Tubes,” First Edition, in § 171.7. PHMSA also adds § 180.212(a)(4) for instruction on derating of a cylinder reference to CGA C-27.

P. Incorporate by reference CGA C-29 (2019)

In its petition (P-1747),³⁷ CGA proposes that PHMSA incorporate by reference CGA C-29 (2019), “Standard for Design Requirements for Tube Trailers and Tube Modules,” First Edition, which would supersede CGA TB-25 (2018), “Design Considerations for Tube Trailers.” CGA also proposes conforming revisions to § 173.301 to replace references to CGA TB-25 with references to CGA C-29. In the NPRM, PHMSA proposed to incorporate by reference CGA C-29 (2019), “Standard for Design Requirements for Tube Trailers and Tube Modules,” in § 171.7, and revise § 173.301 to replace references to CGA TB-25 with references to CGA C-29.

CGA C-29 defines basic design requirements for tube trailers and tube modules to maintain structural integrity during normal conditions of handling and transport. A tube trailer or tube module manufactured in accordance with this standard is less likely to have a separation of the tubes from the trailer or bundle, or an unintentional release of product when subjected to the multidirectional forces that can occur during a highway collision, including a rollover accident. Under this standard, tube modules must meet the loading and accident protection standards that are applied to tube trailers.

In its petition, CGA outlines the changes between the CGA TB-25 (currently incorporated by reference in § 171.7) and CGA C-29. Examples of these revisions include:

- Changing the Technical Bulletin to a CGA Standard.

³⁷ P-1747 – CGA (PHMSA-2020-0117), <https://www.regulations.gov/docket/PHMSA-2020-0117>.

- Changing the title of the document to “Standard for Design Requirements for Tube Trailers and Tube Modules.”
- Adding a scope section that specifies that CGA C-29 is not applicable to a MEGC because MEGC design requirements are found in § 178.75.
- Providing several examples of testing and methods that meet the requirement of verifiable performance testing and analytical methods within the basic design requirements section.
- Changing “should” to “shall” in several places within the document to provide a standard that includes enforceable language.
- Referencing CGA C-23, “Standard for Inspection of DOT/TC 3 Series and ISO 11120 Tube Neck Mounting Surfaces,” Second Edition.

CGA developed CGA C-29 to supersede TB-25 and asserts that CGA C-29 provides a more optimal level of safety for the public and a satisfactory performance standard when cylinders are mounted on motor vehicles or in frames for transportation. In addition, CGA asserts that C-29 provides more enforceable language, whereas TB-25 does not (i.e., use of “shall” vs. “should”).

As noted in the NPRM, PHMSA conducted a technical review of the petition and supporting documents and found that CGA C-29 is technically accurate, consistent with CGA TB-25, and provides safety improvements for the transport of tube trailers. Additionally, PHMSA concludes that tube trailers or modules manufactured in accordance with CGA C-29 are less likely to have separation of tubes from the trailer or bundle, which could result in the unintentional release of hazardous materials, when subjected to multidirectional forces that can occur in highway collisions, including rollover accidents. Therefore, PHMSA asserts the incorporation by reference of CGA C-29 will enhance the safe transportation of hazardous materials in tube trailers.

As noted in the NPRM, PHMSA conducted an economic evaluation and found that most operators are already following the guidelines in CGA C-29, and thus there are limited quantifiable economic benefits. The largest potential source of benefits from mandatory adoption is enhanced safety through a more standardized qualification and testing regime. Minor economic benefits might also be derived from the editorial and definitional clarifications provided in the updated CGA requirements. Making requirements for operators clearer and easier to follow would support compliance with the regulation. A more detailed discussion of the economic analysis of this revision can be found in the RIA posted to the docket for this rulemaking.

PHMSA received comments in support of the proposed revision from CGA. PHMSA did not receive any comments in opposition to the proposed revision. Therefore, PHMSA incorporates by reference CGA C-29, “Standard for Design Requirements for Tube Trailers and Tube Modules,” First Edition, into § 171.7, and removes the references to CGA TB-25, “Design Considerations for Tube Trailers.” PHMSA also revises § 173.301(i) to replace references to CGA TB-25 with references to CGA C-29.

Q. Incorporate by reference CGA V-9 (2019)

In its petition (P-1748),³⁸ CGA requests that PHMSA incorporate by reference CGA V-9 (2019), “Compressed Gas Association Standard for Compressed Gas Cylinder Valves,” Eighth Edition. The HMR currently references the Seventh Edition of CGA V-9 (2012). The major updates to CGA V-9 (2019) ensure continuity and consistency with the testing requirements of ISO 10297, “Gas cylinder—Cylinder valves—Specification and Type Testing.” In the NPRM, PHMSA proposed to incorporate by reference CGA V-9 (2019), “Compressed Gas Association Standard for Compressed Gas Cylinder Valves,” Eighth Edition.

³⁸ P-1748 – CGA (PHMSA-2020-0124), <https://www.regulations.gov/docket/PHMSA-2020-0124>.

The CGA V-9 (2019) standard covers compressed gas cylinder valve design, selection, manufacture, and use, including performance requirements such as operating temperature limits, pressure ranges, and flow capabilities. The standard also includes requirements for materials, inlet and outlet connections, cleaning, qualification and production testing, maintenance, and reconditioning. In addition, CGA V-9 (2019) includes guidelines and requirements for the design, material selection, testing, and marking of cylinder valve protection caps. Finally, the standard provides a listing of valve types and associated drawings and their application and limitations.

As noted in the NPRM, PHMSA conducted a technical review of CGA V-9 (2019) and verified updates and revisions made to CGA V-9 (2012), which is currently incorporated by reference in the HMR. PHMSA found these revisions were primarily editorial in nature, except for the revision to harmonize CGA V-9 (2019) with the testing requirements of ISO 10297. Because PHMSA has already incorporated by reference ISO 10297 in the HMR, there is no technical reason to not incorporate by reference the updated version of CGA V-9 (2019), which references the ISO 10297 standard. In addition, because CGA-V-9 (2019) now references ISO 10297, it will allow greater flexibility in selecting and qualifying valves, and thus avoid redundant compliance with both ISO 10297 and CGA V-9 (2019).

PHMSA asserts that this incorporation by reference will result in benefits to the industry, as CGA V-9 (2019) allows the use of listed valves in other standards, such as those qualified to ISO 10297, thereby avoiding or minimizing additional qualification costs. Manufacturers and users of compressed gas cylinder valves would no longer need to conduct two different tests to satisfy ISO 10927 (as currently required by the HMR) and CGA V-9 (2019). A more detailed discussion of this economic analysis of this revision can be found in the RIA posted to the docket for this rulemaking.

PHMSA received comments in support of the proposed revisions from CGA. PHMSA did not receive any comments in opposition to the proposed revision. Therefore, PHMSA revises

§ 171.7(n)(26) to replace CGA V-9 (2012), “Compressed Gas Association Standard for Compressed Cylinder Valves,” Seventh Edition, with CGA V-9 (2019), “Compressed Gas Association Standard for Compressed Cylinder Valves,” Eighth Edition.

R. Phaseout of hydrofluorocarbons (HFCs)

The Environmental Protection Agency (EPA) published a final rule³⁹ to issue regulations implementing certain provisions of the American Innovation and Manufacturing (AIM) Act,⁴⁰ as enacted on December 27, 2020. One provision of the AIM Act mandates the phasedown of HFCs—a group of chemicals commonly referred to as refrigerants because of their primary use for cooling and refrigeration applications like air conditioning—by at least 85 percent by 2036. HFCs are highly potent greenhouse gases that trap heat in the atmosphere and warm the planet. The AIM Act directs the EPA to implement the phasedown by issuing a fixed quantity of transferrable production and consumption allowances, which producers and importers of hydrofluorocarbons must hold in quantities equal to the number of hydrofluorocarbons they produce or import. For the time period of 2022–2050, the EPA estimated the rulemaking would avoid cumulative emissions of 4,560 million metric tons of exchange value equivalent⁴¹ of HFCs in the United States with a present value of cumulative net benefits of \$272.7 billion.⁴²

The EPA final rule implemented a two-stage approach that would first prohibit additional disposable cylinders (i.e., non-refillables) from being introduced to the market by January 1, 2025, and second, prohibit sales altogether by January 1, 2027. A primary example of a non-refillable cylinder authorized for transport of HFCs is a DOT 39 cylinder. In the final rule, EPA noted that the AIM Act gives the agency broad authority to implement these prohibitions relating

³⁹ 86 FR 55116 (Oct. 5, 2021).

⁴⁰ <https://www.epa.gov/climate-hfcs-reduction/aim-act>.

⁴¹ EPA uses the term “exchange value equivalent” to provide a common unit of measure between HFCs, and the AIM Act defines “exchange value” as the value assigned to a regulated substance (i.e., a regulated HFC).

⁴² 86 FR 55116 (Oct. 5, 2021).

to the sale or distribution, or offer for sale or distribution, of regulated substances that were illegally produced or imported.

In the NPRM, PHMSA proposed adopting the same prohibition on the filling and transportation of certain HFCs in non-refillable cylinders to align with EPA's efforts to fulfill the AIM Act mandate and combat climate impacts, and to avoid potential confusion by industry if PHMSA were to continue to authorize these materials in non-refillable cylinders while prohibited by EPA. In response to this proposal PHMSA received comments from seven different entities opposing the phaseout of HFCs in non-refillable cylinders. Commenters noted that—in their opinion—the proposal goes beyond PHMSA's authority, and therefore PHMSA should not phaseout non-refillable cylinders in the final rule. Additionally, commenters noted that on June 20, 2023, the United States Court of Appeals for the District of Columbia issued a ruling⁴³ that vacated two provisions of the EPA's Phasedown Rule for HFCs. The court found that the EPA did not have statutory authority to require the use of refillable cylinders or to implement a QR code tracking system for HFCs. PHMSA's proposal to phaseout non-refillable cylinders for the transportation of HFCs was predicated on harmonizing the HMR with the EPA regulations. Following the decision by the United States Court of Appeals for the District of Columbia, PHMSA is no longer considering the phaseout of HFCs in this final rule, and will not finalize the proposal to prohibit the filling and transportation of certain HFCs in non-refillable cylinders.

S. Emergency processing of special permits

Section 107.117 outlines the conditions necessary for applicants who apply for emergency processing of their special permit request. PHMSA occasionally issues a special permit that the Associate Administrator determines is needed to address an imminent safety issue, a threat to national security, or to prevent significant economic loss. *See* § 107.117(a).

⁴³ <https://www.govinfo.gov/app/details/USCOURTS-caDC-21-01251/USCOURTS-caDC-21-01251-0>.

However, PHMSA has found it necessary to add an additional criteria due to situations that require processing of an emergency special permit but are not clearly outlined in the current § 107.117(a). To meet this need, PHMSA proposed adding a new paragraph (a)(4) to provide clarification that the Associate Administrator may also approve emergency processing of a special permit in support of certain essential governmental functions—both foreign and domestic. For example, a foreign government request for the emergency processing of a special permit application regarding the timely movement of a hazardous material—from or through the United States—in support of law enforcement, life safety (*e.g.*, providing health services items or equipment containing hazardous materials during a pandemic), or judicial activities may qualify under the new paragraph. Furthermore, to provide additional clarification of § 107.117(a)(2), PHMSA proposed to split the current clauses into two distinct paragraphs—(a)(2) and (3).

PHMSA received comments from COSTHA in support of both revisions as proposed. PHMSA did not receive any comments in opposition to the proposed revisions. Therefore, to provide two instances of clarification of § 107.117(a), PHMSA will add a new paragraph (a)(4) and split the current clauses from paragraph (a)(2) into two distinct paragraphs—(a)(2) and (3).

V. Section-by-Section Review

Below is a section-by-section description of the revisions.

A. Section 107.117

Section 107.117 outlines situations when emergency processing of special permits may be appropriate. In this final rule, PHMSA adds § 107.117(a)(4) to clarify that PHMSA may use emergency processing of special permits in support of essential governmental functions. Separately, to provide clarification of § 107.117(a)(2), PHMSA is splitting the current clauses into two distinct paragraphs—(a)(2) and (3).

B. Section 171.7

Section 171.7 lists all standards incorporated by reference into the HMR that are not specifically set forth in the regulations. In this final rule, PHMSA incorporates by reference the following publications by CGA, IME, and the UN:

- CGA C-7 (2020), *Guide to Classification and Labeling of Compressed Gases* (Eleventh Edition), into § 172.400a. This publication has been prepared as a guide for the classification and labelling of compressed gases. It is general in nature and does not cover all circumstances for each individual cylinder type or lading.
- CGA C-20 (2014), *Requalification Standard for Metallic, DOT, and TC 3-Series Gas Cylinders and Tubes Using Ultrasonic Examination* (Second Edition), into § 180.205. This publication is used for the requalification of seamless cylinders and tubes using UE. It is general in nature and does not cover all circumstances for each individual cylinder type or lading.
- CGA C-23 (2018), *Standard for Inspection of DOT/TC 3 Series and ISO 11120, Tube Neck Mounting Surfaces* (Second Edition), into §§ 180.205 and 180.207. This publication applies to the inspection and evaluation of DOT/TC 3-Series and ISO 11120 tubes 12 ft (3.7 m) or longer with an outside diameter greater than or equal to 18 in (457 mm) that are supported by the neck mounting surface. It is general in nature and does not cover all circumstances for each individual cylinder type or lading.
- CGA C-27 (2019), *Standard Procedure to Derate the Service Pressure of DOT 3-Series Seamless Steel Tubes* (First Edition), into § 180.212. This publication provides a standard procedure to derate the service pressure of DOT 3-series seamless steel tubes with local thin areas (LTA) that do not meet the minimum wall thickness of certain DOT specifications. It is general in nature and does not cover all circumstances for each individual cylinder type or lading.

- CGA C-29 (2019), *Standard for Design Requirements for Tube Trailers and Tube Modules* (First Edition), into § 173.301. This publication defines basic design requirements for tube trailers and tube modules, manufactured or modified on or after May 11, 2009, to maintain structural integrity during normal conditions of handling and transport. It is general in nature and does not cover all circumstances for each individual cylinder type or lading. Tube trailers manufactured or modified before May 11, 2009, can continue to follow the requirements in TB-25, “Design Considerations for Tube Trailers.” Any modifications to the tube trailer, however, should be done in accordance with CGA C-29.
- CGA V-9 (2019), *Compressed Gas Association Standard for Compressed Gas Cylinder Valves* (Eighth Edition), into § 173.301. This publication covers cylinder valve design, manufacture, and use including performance requirements such as operating temperature limits, pressure ranges, and flow capabilities. It is general in nature and does not cover all circumstances for each individual cylinder type or lading.
- SLP-22 (2019), *Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials*, into §§ 173.63 and 177.835. This publication outlines the guidelines for the safe transportation of detonators in commercial transportation.
- SLP-23 (2021), *Recommendations for the Transportation of Explosives, Division 1.5; Ammonium Nitrate Emulsions, Division 5.1; and Combustible Liquids in Bulk Packaging*, into §§ 172.102, 173.66 introductory text, 173.251, and 177.835(d). This publication specifies the requirements for the transportation in bulk packaging of certain Class 1 and Class 5 hazardous materials essential to commercial blasting operations.
- *European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR)*, which is already incorporated by reference in § 171.23, into § 171.8. The European Agreement concerning the International Carriage of Dangerous Goods by Road

(ADR) outlines regulations concerning the international carriage of dangerous goods by road within the EU and other countries that are party to the agreement. This publication presents the European Agreement, the Protocol Signatures, the annexes, and the amendments. In addition to a new title, the 2020 edition of this document includes amendments necessary to ensure harmonization of ADR with the UN Model Regulations, additional amendments adopted by the Working Group on Tanks, as well as amendments proposed by the Working Group on Standards.

- United Nations' *Recommendations on Test Series 8: Applicability of Test Series 8(d)*, June 2019, into § 172.102(c)(1), special provision 148. This test series is used to determine if an ammonium nitrate emulsion, suspension, or gel, intermediate for blasting explosives (ANE), is insensitive enough for inclusion in Division 5.1, and to evaluate the suitability for transport in tanks.

Additionally, CGA has moved to a new headquarters location. Therefore, we have revised § 171.7(n) accordingly.

C. Section 171.8

Section 171.8 defines terms used throughout the HMR that have broad or multi-modal applicability. PHMSA modifies the definition of *liquid* in § 171.8 to include the test for determining fluidity (penetrometer test) prescribed in section 2.3.4 of Annex A of the ADR as an alternative method for determining if a material is a liquid.

D. Section 172.101

The HMT is contained in § 172.101. The HMT lists alphabetically, by proper shipping name, those materials that have been designated hazardous materials for the purpose of transportation. It provides information used on shipping papers, package marking, and labeling, as well as other pertinent shipping information for hazardous materials. PHMSA amends the

HMT by referencing special provision TP48 in Column (7) of the HMT for the following HMT entries: “UN0332, Explosive, Blasting, type E;” “UN3375, Ammonium nitrate emulsion;” and “UN3139, Oxidizing liquid n.o.s. (PG II).”

E. Section 172.102

Section 172.102 lists special provisions applicable to the transportation of specific hazardous materials. Special provisions contain packaging requirements, prohibitions, and exceptions applicable to quantities or forms of hazardous materials. PHMSA adds a new special provision—“TP48”—to allow the use of IM 101 and 102 portable tanks when transported in accordance with SLP-23. In addition, PHMSA revises special provision “148” to require materials assigned this provision to be subject to the Vented Pipe Test (VPT). This ensures continued performance of VPT requirements in the absence of required use of the test in the update of the incorporation by reference of IME SLP-23.

F. Section 172.514

Section 172.514 prescribes the placarding requirements for bulk packagings. PHMSA revises § 172.514(c)(1) and (4) to allow an option to use a placard that meets the label specification size requirements in § 172.407(c) for combustible liquids transported in IBCs and portable tanks.

G. Section 173.4b

Section 173.4b prescribes exceptions for transporting certain hazardous materials in *de minimis* quantities. PHMSA revises paragraph (a) to include Division 6.1, PG I materials (no inhalation hazard) in the list of materials authorized for this exception.

H. Section 173.115

Section 173.115 prescribes definitions for Class 2, Divisions 2.1, 2.2, and 2.3 hazardous materials. PHMSA revises § 173.115(e) to state that gas mixtures with component(s) that are liquefied gases may be described using the appropriate hazardous materials description of a non-liquefied compressed gas in the HMT at § 172.101 when the partial pressure(s) of the liquefied component(s) in the mixture are reduced so that the mixture is entirely in the gas phase at 20°C.

I. Section 173.185

Section 173.185 prescribes the requirements for packaging and transporting lithium cells and batteries. PHMSA revises paragraph (c)(3) to clarify that lithium button cell batteries contained in equipment are not subject to any per package or consignment limitations.

J. Section 173.251

Section 173.251 outlines the bulk packaging requirements for ammonium nitrate emulsion, suspension, or gel. PHMSA revises § 173.251 to state that this section is not applicable when “UN3375, Ammonium nitrate emulsion” is transported in IM 101 or 102 portable tanks in accordance with SLP-23 (2021).

K. Section 173.301

Section 173.301 outlines the general requirements for shipment of compressed gases and other hazardous materials in cylinders, UN pressure receptacles, and spherical pressure vessels. PHMSA revises § 173.301 to replace references to CGA TB-25 with references to CGA C-29.

L. Section 173.302a

Section 173.302a specifies the additional requirements for shipment of non-liquefied (permanent) compressed gases in specification cylinders. PHMSA revises paragraph (c) by

redesignating § 173.302a(c)(3)(i) and (ii) as § 173.302a(c)(4) and (5) to properly reflect that the safety provisions currently in § 173.302a(c)(3)(i) and (ii) are independent material construction requirements under paragraph (c). PHMSA also adds paragraph (c)(6) to require that cylinders be equipped with pressure relief devices sized and selected as to type, location, and quantity, and tested in accordance with CGA S-1.1 (previously in paragraph (c)(4)). Lastly, PHMSA adds paragraph (c)(7) to require a plus sign (+) be added following the test date marking on the cylinder to indicate compliance with paragraph (c) of this section.

M. Section 173.302b

Section 173.302b describes the additional requirements for shipment of non-liquefied (permanent) compressed gases in UN pressure receptacles. PHMSA revises this section by adding a new paragraph (f) to specify packaging restrictions for transporting compressed natural gas and methane in UN seamless steel pressure receptacles. For methane and natural gas with a methane content of 98 percent or greater, the maximum tensile strength of the UN seamless steel pressure receptacle may not exceed 1100 MPa (159,542 psi), and the contents must be free of corroding components. For natural gas with methane content of less than 98 percent, the maximum tensile strength of the UN seamless steel pressure receptacle may not exceed 950 MPa (137,750 psi). Additionally, each discharge end of a UN refillable seamless steel tube must be equipped with an internal drain tube, and the moisture content and concentration of the corroding components must conform to the requirements in § 173.301b(a)(2).

N. Section 178.601

Section 178.601 prescribes the general requirements for the testing of non-bulk performance-oriented packagings and packages. PHMSA redesignates paragraphs (g)(6) through (8) as paragraphs (g)(7) through (9) and adds new paragraph (g)(6) to allow packages tested with articles containing small arms, i.e., ammunition without intermediate packaging(s), to be

assembled with any intermediate packaging(s) without further testing. Moreover, PHMSA revises the redesignated paragraph (g)(8) approval provision to include new paragraph (g)(6), such that paragraphs (g)(1) through (7) are referenced in the revised paragraph (g)(8).

O. Section 180.205

Section 180.205 prescribes the general requirements for requalification of specification cylinders. PHMSA revises this section to incorporate provisions consistent with CGA C-20-2014, “Requalification Standard for Metallic, DOT and TC 3-Series Gas Cylinders and Tubes Using Ultrasonic Examination” (Second Edition), which allow for the use of UE for cylinder requalification. PHMSA revises paragraph (e)(2) to state that cylinders in corrosive liquid service are still required to do both an internal and external visual inspection. PHMSA is revising paragraph (f)(2) to state that if a cylinder or tube is requalified by ultrasonic examination, only an external visual inspection is required. Additionally, PHMSA adds a new paragraph (h) to specify that requalification using UE must be done in accordance with CGA C-20 and by a facility approved by PHMSA for performing UE operations. PHMSA revises paragraphs (i) and (j) to specify the rejection requirements for a cylinder that fails requalification tests.

PHMSA also adds § 180.205(c)(5). This paragraph specifies that a DOT 3-series specification cylinder that is 12 feet or longer with an outside diameter greater than or equal to 18 inches and supported by the neck mounting surface during transportation in commerce must be inspected at least every 10 years in accordance with CGA C-23. Lastly, PHMSA adds paragraph (d)(5) to specify the conditions for removal and examination of cylinders in accordance with CGA C-23.

P. Section 180.207

Section 180.207 prescribes the requirements for the requalification of UN pressure receptacles. PHMSA revises § 180.207(d)(1) to require that each seamless steel UN pressure

receptacle that is 12 feet or longer with an outside diameter greater than or equal to 18 inches supported by the neck mounting surface during transportation in commerce be inspected at least every 10 years in accordance with CGA C-23. In addition, PHMSA specifies conditions for removal and examination of the cylinder in accordance with CGA C-23.

Q. Section 180.209

Section 180.209 describes the requalification requirements for specification cylinders. PHMSA is making an editorial revision to table 1 in paragraph (a) to reference the UE for 3T and special permit cylinders. PHMSA is also making editorial revisions to paragraphs (d) and (m) to reference § 180.205(j) instead of § 180.205(i) to conform with a redesignation of that paragraph.

R. Section 180.212

Section 180.212 specifies the requirements for the repair of seamless DOT 3-series specification cylinders and seamless UN pressure receptacles. PHMSA adds § 180.212(a)(4) to allow derating the service pressure of DOT 3-series seamless steel tubes. PHMSA also revises § 180.212(b)(2) to: (1) allow, as a repair, the external threading of a DOT 3-series cylinder or a seamless UN pressure receptacle manufactured without external threads; and (2) not limit external rethreading to UN pressure receptacles mounted in a MEGC.

VI. Regulatory Analyses and Notices

A. *Statutory/Legal Authority for This Rulemaking*

This rulemaking is published under the authority of Federal Hazardous Materials Transportation Law (Federal Hazmat Law; 49 U.S.C. 5101 *et seq.*), which authorizes the Secretary of Transportation to “prescribe regulations for the safe transportation, including security, of hazardous materials in intrastate, interstate, and foreign commerce.” The Secretary has delegated the authority granted in the Federal Hazmat Law to the PHMSA Administrator at

49 CFR 1.97. This rulemaking amends several sections of the HMR in response to petitions for rulemaking received from the regulated community.

B. Executive Orders 12866 and 14094, and DOT Regulatory Policies and Procedures

Executive Order 12866 (“Regulatory Planning and Review”),⁴⁴ as amended by Executive Order 14094 (“Modernizing Regulatory Review”),⁴⁵ requires that agencies “should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating.” Agencies should consider quantifiable measures and qualitative measures of costs and benefits that are difficult to quantify. Further, Executive Order 12866 requires that agencies should select those regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach. Similarly, DOT Order 2100.6A (“Rulemaking and Guidance Procedures”) requires that regulations issued by PHMSA and other DOT Operating Administrations should consider an assessment of the potential benefits, costs, and other important impacts of the proposed action, and should quantify (to the extent practicable) the benefits, costs, and any significant distributional impacts, including any environmental impacts.

Executive Order 12866 and DOT Order 2100.6A require that PHMSA submit “significant regulatory actions” to the Office of Management and Budget (OMB) for review. This rulemaking is not considered a significant regulatory action under section 3(f) of Executive Order 12866 (as amended) and, therefore, was not formally reviewed by OMB. This rulemaking is also not considered a significant rule under DOT Order 2100.6A.

⁴⁴ 58 FR 51735 (Oct. 4, 1993).

⁴⁵ 88 FR 21879 (April 11, 2023). PHMSA acknowledges that a recent update to Circular A-4 contemplates that agencies will use a different discount rate than those employed in the discussion below and the Regulatory Impact Analysis (RIA) beginning in January 2025. However, PHMSA notes that that update to Circular A-4 permits the use of those historical discount rates based on the *Federal Register* publication date of this final rule. See OMB, Circular A-4, “Regulatory Analysis” at 93 (Nov. 9, 2023).

PHMSA is responding to 18 petitions that have been submitted by the public in accordance with the APA and PHMSA’s rulemaking procedure regulations (49 CFR 106.95 and 106.100). Overall, this final rule would maintain the continued safe transportation of hazardous materials while producing a net cost savings. PHMSA’s findings are summarized here and described in further detail in the Regulatory Impact Analysis (RIA), which can be found in the regulatory docket (Docket ID: PHMSA-2020-0102) at www.regulations.gov.

Summary of Findings

PHMSA estimates a present value of quantified net cost savings of approximately \$19.95 million over a perpetual time horizon and \$1.99 million annualized at a two percent discount rate. These estimates do not include non-monetized and qualitative cost/cost savings discussed in the RIA.

PHMSA’s cost savings analysis relies on the monetization of impacts for seven petitions included in this rulemaking. All but one of these petitions have annualized cost savings. The following table presents a summary of the seven petitions that would have monetized impacts upon codification and contribute to PHMSA’s estimation of quantified net cost savings.

Total Estimated Cost Savings, 2024-2033, Discounted at 2% rate, 2023\$USD

	Rule Provision	Total Net Cost Savings	Annualized Net Cost Savings
P-1718	49 CFR 173.4b	1,785,696	178,570
P-1727	49 CFR 180.205	303,127	30,313
P-1729	49 CFR 171.7	(127,026)	(12,703)
P-1731	49 CFR 171.7(r)(2)	67,460	6,746
P-1732	49 CFR 178.503(a)(6)	8,267,109	826,711
P-1734	49 CFR 172.514(c)(4)	4,244	424
P-1736	49 CFR 171.7(r)(1)	9,655,983	965,598
Total		\$ 19,956,593	\$ 1,995,659

In addition to these seven items, PHMSA described an additional 11 items that may streamline regulatory compliance. While information gaps prevent quantification of cost savings for these items, PHMSA has determined they provide relief from unnecessary requirements or provide additional flexibility without compromising safety.

Conclusion

This final rule is not considered a significant regulatory action within the meaning of Executive Order 12866, as amended, and DOT policies and procedures. (*See* DOT Order 2100.6A.) The economic effects of this regulatory action would not have an effect on the economy that exceeds the annual monetary threshold defined by Executive Order 12866 (as amended), and that the regulatory action is not otherwise significant. PHMSA estimates a present value of quantified net cost savings of approximately \$19.95 million over a perpetual time horizon and \$1.99 million annualized at a two percent discount rate. Please see the RIA in the regulatory docket for additional detail and a description of PHMSA's methods and calculations.

C. Executive Order 13132

This rulemaking was analyzed in accordance with the principles and criteria contained in Executive Order 13132 ("Federalism")⁴⁶ and the Presidential memorandum ("Preemption").⁴⁷ Executive Order 13132 requires agencies to assure meaningful and timely input by state and local officials in the development of regulatory policies that may have "substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government." This rulemaking does not revise 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.

Federal Hazmat Law contains a general preemption provision (49 U.S.C. 5125(a)) in the event compliance with a State, local, or Native American Tribe requirement is not possible or presents an obstacle to compliance. Additionally, Federal Hazmat Law contains an express

⁴⁶ 64 FR 43255 (Aug. 10, 1999).

⁴⁷ 74 FR 24693 (May 22, 2009).

preemption provision (49 U.S.C. 5125(b)) that preempts State, local, and Native American Tribal requirements on:

- (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.
- (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 final rule addresses covered subject items above and preempts State, local, and Indian Tribe requirements not meeting the “substantively the same” standard. DOT has determined that this final rule would provide cost savings and regulatory flexibility to the regulated community without compromising safety.

D. Executive Order 13175

This rulemaking was analyzed in accordance with the principles and criteria contained in Executive Order 13175 (“Consultation and Coordination with Indian Tribal Governments”⁴⁸) and DOT Order 5301.1A (“Department of Transportation Tribal Consultation Policy and Procedures”). Executive Order 13175 requires agencies to assure meaningful and timely input from Indian Tribal government representatives in the development of rules that significantly or uniquely affect Tribal communities by imposing “substantial direct compliance costs” or

⁴⁸ 65 FR 67249 (Nov. 6, 2000).

“substantial direct effects” on such communities, or the relationship and distribution of power between the Federal Government and Tribes.

PHMSA has determined that this rulemaking does not have substantial Tribal implications, because it will not substantially or uniquely affect Tribal communities or Indian Tribal governments. The final rule’s regulatory amendments are facially neutral and will have broad, national scope; the rule will not significantly or uniquely affect Tribal communities, much less impose substantial compliance costs on Native American Tribal governments or mandate Tribal action. And insofar as PHMSA concludes that the final rule will improve safety and reduce environmental risks associated with transportation of hazardous materials, PHMSA expects it will not entail disproportionately high adverse risks for Tribal communities. Therefore, the funding and consultation requirements of Executive Order 13175 do not apply.

E. Regulatory Flexibility Act, Executive Order 13272, and DOT Procedures and Policies

The Regulatory Flexibility Act, as amended by the Small Business Regulatory Flexibility Fairness Act of 1996 (RFA; 5 U.S.C 601 et seq.), requires agencies to consider whether a rulemaking would have a “significant economic impact on a substantial number of small entities” to include small businesses; not-for-profit organizations that are independently owned and operated and are not dominant in their fields; and governmental jurisdictions with populations under 50,000. The RFA directs agencies to establish exceptions and differing compliance standards for small businesses, where possible to do so and still meet the objectives of applicable regulatory statutes. Executive Order 13272 (“Proper Consideration of Small Entities in Agency Rulemaking”)⁴⁹ requires agencies to establish procedures and policies to promote compliance with the RFA and to “thoroughly review draft rules to assess and take appropriate account of the potential impact” of the rules on small businesses, governmental

⁴⁹ 67 FR 53461 (Aug. 16, 2002).

jurisdictions, and small organizations. The DOT posts its implementing guidance on a dedicated webpage.

This rulemaking has been developed in accordance with Executive Order 13272 and DOT's procedures and policies to promote compliance with the RFA and ensure that potential impacts of rulemakings on small entities are properly considered. PHMSA prepared an initial regulatory flexibility analysis within the Preliminary Regulatory Impact Analysis (PRIA) supporting the NPRM. The small entities that could be impacted by this rule include all small entities engaged in the shipment of hazardous materials that are already subject to HMR requirements. PHMSA expects this final rule to facilitate new technologies or other changes that provide safety equivalence at lower cost; streamline or reduce recordkeeping and other paperwork and reporting requirements; and address other changes to reduce the regulatory burden of the HMR. PHMSA has individually evaluated each of the regulatory amendments contained in this rulemaking using available information, and PHMSA certifies that the changes adopted in this final rule will (neither individually nor in the aggregate) have a significant economic impact on a substantial number of small businesses. PHMSA has provided a regulatory flexibility analysis for this final rule within the RIA in the docket for this proceeding.

F. Paperwork Reduction Act

Under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.), no person is required to respond to any information collection unless it has been approved by OMB and displays a valid OMB control number. Pursuant to 44 U.S.C. 3506(c)(2)(B) and 5 CFR 1320.8(d), PHMSA must provide interested members of the public and affected agencies an opportunity to comment on information collection and recordkeeping requests.

PHMSA has analyzed this rulemaking in accordance with the Paperwork Reduction Act. This final rule does not impose new information collection requirements. PHMSA currently has an approved information collection under OMB Control No. 2137-0051, entitled "Rulemaking,

Special Permits, and Preemption Requirements,” expiring on November 30, 2024. This rulemaking eliminates the need for persons to renew a special permit, resulting in a decrease in burden. PHMSA estimates the reduction in information collection burden as follows:

OMB Control No. 2137-0051: Rulemaking, Special Permits, and Preemption Requirements

Decrease in Annual Number of Respondents: 139

Decrease in Annual Responses: 139

Decrease in Annual Burden Hours: 208.5

Decrease in Annual Burden Cost: \$0

PHMSA did not receive any comments related to the Paperwork Reduction Act in the comments to the NPRM. Please direct your requests for a copy of this information collection to Steven Andrews, Office of Hazardous Materials Standards (PHH-12), Pipeline and Hazardous Materials Safety Administration, 1200 New Jersey Avenue SE., 2nd Floor, Washington, D.C., 20590-0001.

G. Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 (UMRA; 2 U.S.C. 1501 et seq.) requires agencies to assess the effects of Federal regulatory actions on State, local, and Tribal governments, and the private sector. For any NPRM or final rule that includes a Federal mandate that may result in the expenditure by State, local, and Tribal governments, or by the private sector of \$100 million or more in 1996 dollars in any given year, the agency must prepare, amongst other things, a written statement that qualitatively and quantitatively assesses the costs and benefits of the Federal mandate.

As explained in the RIA, available for review in the docket, this final rule does not impose unfunded mandates under the UMRA. It does not result in costs of \$100 million or more in 1996 dollars to either State, local, or Tribal governments, or to the private sector, in any one

year. Therefore, the analytical requirements of UMRA do not apply. A copy of the RIA is available for review in the docket.

H. Environmental Assessment

The National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) requires that Federal agencies analyze actions to determine whether the action would have a significant impact on the human environment. The Council on Environmental Quality implementing regulations (40 CFR parts 1500 through 1508) requires Federal agencies to consider the environmental impacts of their actions in the decision-making process. NEPA requires Federal agencies to assess the environmental effects of proposed Federal actions prior to making decisions and involve the public in the decision-making process. Agencies must prepare an environmental assessment (EA) for an action for which a categorical exclusion is not applicable, and is either unlikely to have significant effects or when significance of the action is unknown. In accordance with these requirements, an EA must briefly discuss: (1) the need for the action; (2) the alternatives considered; (3) the environmental impacts of the action and alternatives; and (4) a listing of the agencies and persons consulted. If, after reviewing the EA and public comments (as applicable), in response to a draft EA (DEA), an agency determines that a proposed action will not have a significant impact on the human or natural environment, it can conclude the NEPA analysis with a finding of no significant impact (FONSI). DOT Order 5610.1C (“Procedures for Considering Environmental Impacts”) establishes departmental procedures for evaluation of environmental impacts under NEPA and its implementing regulations. PHMSA did not receive any comments related to the DEA in response to the NPRM. This final EA (FEA) adopts by reference the analysis included above in this final rule and in the NPRM.

1. PURPOSE AND NEED

In response to petitions for rulemaking submitted by the regulated community, PHMSA is amending the HMR to update, clarify, or streamline various regulatory requirements. Specifically, PHMSA amendments include—but are not limited to—the following: incorporating by reference (IBR) multiple publications from CGA, IME, and the UN; allowing for greater flexibility of packaging options in the transportation of compressed natural gas in cylinders; streamlining the approval application process for the repair of specific DOT specification cylinders; providing greater clarity regarding the filling requirements for certain cylinders used to transport hydrogen and hydrogen mixtures; streamlining hazard communication by allowing marking exceptions under certain conditions during the transportation of lithium button cell batteries; and modifying the definition of liquid to include the test for determining fluidity (penetrometer test) prescribed in the ADR.

These amendments are intended to promote safety, provide clarity, and streamline regulatory requirements. The amendments were identified in response to petitions from stakeholders affected by the HMR. These amendments clarify the HMR and enhance safety, while offering some net economic benefits.

This action: (1) fulfills our statutory directive to promote transportation safety; (2) fulfills our statutory directive under the Administrative Procedure Act that requires Federal agencies to give interested persons the right to petition an agency to issue, amend, or repeal a rule (5 U.S.C. 553(e)); (3) supports governmental efforts to eliminate unnecessary burdens on the regulated community; (4) addresses safety concerns raised by petitioners and removes identified regulatory ambiguity; and (5) simplifies and clarifies the regulations to promote understanding and compliance.

These regulatory revisions would offer more efficient and effective ways of achieving the PHMSA goal of safe and secure transportation of hazardous materials in commerce, protecting both people and the environment.

2. ALTERNATIVES CONSIDERED

In this rulemaking, PHMSA is considering the following alternatives:

ALTERNATIVE #1: NO ACTION:

If PHMSA were to select the No Action Alternative, current regulations would remain in place and no provisions would be amended or added.

ALTERNATIVE #2: AMEND THE HMR AS PROVIDED IN THIS FINAL RULE:

The Final Rule Alternative would adopt the HMR amendments set forth in this final rule and was previously referred to as the “Proposed Action Alternative” in the draft environmental assessment (DEA) that was included within the NPRM. The amendments included in this alternative are more fully discussed in the preamble and regulatory text sections of this final rule.

3. REASONABLY FORESEABLE ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES

ALTERNATIVE #1: NO ACTION

After careful consideration of public comments to the NPRM (none of which directly addressed the DEA), and revised analyses of economic and environmental impacts of the Proposed Action Alternative, PHMSA is adopting the Proposed Action Alternative (i.e., the Final Rule) as the Selected Action. If PHMSA selected the No Action Alternative, the HMR would remain unchanged, and no provisions would be amended or added. However, any economic benefits gained through the proposals, which include harmonization in updates to transport standards, lists of regulated substances, definitions, packagings, markings requirements, shipper requirements, and modal requirements, would not be realized. Foregone efficiencies in the No Action Alternative also include freeing up limited resources to concentrate on hazardous materials transportation issues of potentially much greater environmental impact. Not adopting the environmental and safety requirements in the final rule under the “No Action Alternative” would result in a lost opportunity for reducing negative environmental and safety-related impacts due to the revisions in this final rule decreasing the possibility of a hazardous release. Greenhouse gas emissions would remain the same under the No Action Alternative. However,

the No Action Alternative could have a modest negative impact on GHG emissions. PHMSA anticipates the provisions for the transportation of compressed natural gas/methane in UN pressure receptacles to have a minimal positive effect on greenhouse gas emissions. This would result from stricter packaging restrictions that should result in fewer failures of these packages and thus, fewer releases of materials into the environment. Therefore, by choosing the No Action Alternative, a potential reduction in GHG emissions would not be achieved.

4. FINAL ACTION ALTERNATIVE

When developing potential regulatory requirements, PHMSA evaluates those requirements to consider the environmental impact of each amendment. Specifically, PHMSA evaluates the risk of release and resulting environmental impact; the risk to human safety, including any risk to first responders; the longevity of the packaging; and if the regulation would be carried out in a defined geographic area using specific resources, especially any sensitive areas and how they could be impacted by any regulations. The regulatory changes in this rulemaking have been determined to be clarification, technology/design updates, harmonization, regulatory flexibility, standard incorporation, or editorial in nature. As such, these amendments have little or no impact on the risk of release and resulting environmental impact, human safety, or longevity of the packaging. None of these amendments would be carried out in a defined geographic area because this is a nationwide rulemaking.

The “Final Action Alternative” encompasses enhanced and clarified regulatory requirements, which would result in increased compliance and fewer negative environmental and safety impacts. This EA incorporates the safety analyses in the preamble sections of the final rule. The table and list below summarize the possible environmental benefits, greenhouse gas emissions, and any potential negative impacts for the amendments in the final rule.

Summary of Probable Environmental Impacts by Amendments			
Amendment(s) to HMR (lettered as above herein)	Type of Amendment(s)	Probable Anticipated Environmental Impact(s)	Greenhouse Gas Emissions
1. P-1714 - Transportation of Compressed Natural Gas / Methane in UN Pressure Receptacles	Regulatory Flexibility	Minimal positive impacts	Minimal positive impacts
2. P-1716 - Threading and repair of seamless DOT 3-series specification cylinders and seamless UN pressure receptacles	Regulatory Flexibility	No impacts	No impacts
3. P-1717/P-1725 - Clarification of the requirements for non-liquefied compressed gases.	Regulatory Flexibility	No impacts	No impacts
4. P-1718 - De minimus quantities of poisonous materials	Regulatory Flexibility – Harmonization	No impacts	No impacts
5. P-1736 - Clarification of the marking requirements for button cell lithium batteries contained in equipment	Regulatory Flexibility	No impacts	No impacts
6. P-1727 - IBR of CGA C-20 (2014)	Standard Incorporation	No impacts	No impacts
7. P-1728 - Gas Mixtures Containing Components Defined as Liquefied Gases	Regulatory Flexibility	No impacts	No impacts
8. P-1729 - Incorporation by reference of CGA C-23 (2018)	Standard Incorporation	Minimal positive impacts	No impacts
9. P-1731 - IBR of IME’s Safety Library Publication 23 (SLP-23)	Standard Incorporation	No impacts	No impacts
10. P-1732 - Revision of testing and marking of UN specification packagings	Regulatory Flexibility	No impacts	No impacts
11. P-1734 - Authorizing smaller-sized combustible placard on IBCs	Regulatory Flexibility	No impacts	No impacts
12. P1736 - IBR of IME Safety Library Publication 22 (SLP-22)	Standard Incorporation	Minimal positive impacts.	No impacts
13. P-1738 – Definition of a Liquid	Regulatory Flexibility – Harmonization	No impacts	No impacts
14. P-1744 - Incorporate by reference updated Appendix A to CGA C-7 (2020)	Standard Incorporation	No impacts	No impacts
15. P-1746 - IBR of CGA C-27 (2019)	Standard Incorporation	No impacts	No impacts
16. P-1747 - IBR of CGA C-29 (2019)	Standard Incorporation	Minimal positive impacts	No impacts
17. P-1748 - IBR of CGA V-9 (2019)	Standard Incorporation	No impacts	No impacts

1. P-1714 – PHMSA is implementing packaging restrictions for the transportation of CNG and methane in UN seamless steel pressure receptacles with a tensile strength greater than 950 MPa. As discussed in sections III and IV of this final rule, the packaging restrictions should result in fewer failures of these packages and thus, fewer releases of materials into the

environment. Additionally, because this revision involves the transportation of GHGs, its effect on the reduction of GHGs emissions may be minimal.

2. P-1716 – PHMSA is revising the requirements for repairing seamless DOT 3-series specification cylinders and seamless UN pressure receptacles manufactured without external threads and authorizing the performance of this work without requiring prior approval from PHMSA. This revision provides regulatory flexibility while maintaining safety. As discussed in sections III and IV of this final rule, PHMSA has determined that this is an improvement over the previous method of using set screws to secure the tubes, which resulted in indentations being carved into the tube necks as the tube jostled during transport. This revision is intended to lower the risk of an incident since this package is expected to increase safety, so the proposal may result in positive environmental impacts due to less risk of an accident in transportation. This revision will not result in any increase to GHG emissions due to the decreased probability of an incident involving these cylinders.

3. P-1717/P-1725 – PHMSA is amending § 173.302a(c) of the HMR to reflect the independent material construction requirements for cylinders with special filling limits for DOT specification 3A, 3AX, 3AA, and 3AAX cylinders containing Division 2.1 (flammable) gases. As discussed in sections III and IV of this final rule, these amendments would not represent any incremental, quantifiable safety effects because PHMSA already authorizes the transportation in commerce of hydrogen and mixtures of hydrogen with helium, argon, or nitrogen in certain cylinders filled to 10 percent in excess of their marked service pressures. Therefore, this revision will not have any impacts on the environment nor GHG emissions.

4. P-1718 – PHMSA is amending § 173.4b to harmonize the *de minimis* exceptions for Division 6.1, PG I (no inhalation hazard) materials with international regulations. The release of Division 6.1, PG I materials, including toxic substances, poisons, and irritating material, can have a negative effect on human health and the environment due to toxicity levels of the material. However, as discussed in sections III and IV of this final rule, because the revisions

would authorize an existing exception for *de minimis* quantities of additional materials with appropriate safeguards, PHMSA does not anticipate any significant environmental impacts nor any effects on GHG emissions.

5. P-1726 – PHMSA is revising § 173.185(c)(3) to clarify that lithium button cell batteries installed in equipment are excepted from the marking requirement and not subject to the quantity per package or per consignment limitation. As discussed in sections III and IV of this final rule, because this is not a new requirement and simply clarifies the current requirements in the HMR, there are no environmental impacts and no changes in GHG emissions.

6. P-1727 – PHMSA is incorporating by reference CGA C-20 (2014), “Requalification Standard for Metallic, DOT, and TC 3-Series Gas Cylinders and Tubes Using Ultrasonic Examination, Second Edition.” CGA C-20 provides technical specification for the ultrasonic examination of cylinders. As discussed in sections III and IV of this final rule, PHMSA expects that the use of ultrasonic examination will provide a level of safety at least equivalent to what is currently allowed under the HMR. PHMSA already allows for the ultrasonic examination of certain cylinders (*see* § 180.212 for example). Additionally, § 180.205(f) will no longer require internal visual inspection for these cylinders once they have undergone ultrasonic examination, as these actions would be duplicative. The incorporation by reference of CGC C-20 will not have any environmental impacts and will not result in any increase to GHG emissions.

7. P-1728 – PHMSA is authorizing an alternative description of gas mixtures containing components defined as liquefied gases. This revision helps clarify confusion among stakeholders when the content of a cylinder is described as a liquefied compressed gas that resembles a non-liquefied compressed gas. As discussed in sections III and IV of this final rule, PHMSA has determined that the revision is safety neutral or slightly improves safety, and will provide regulatory flexibility to the regulated community without a reduction in safety. For these reasons, this revision will not have any environmental impacts nor result in any increase to GHG emissions.

8. P-1729 – PHMSA is incorporating by reference CGA C-23 (2018), “Standard for Inspection of DOT/TC 3 series and ISO 11120 Tube Neck Mounting Surfaces, Second Edition,” into the HMR at § 171.7. As discussed in sections III and IV of this final rule, CGA C-23 provides an inspection standard that PHMSA anticipates will reduce the likelihood of a release from a DOT/TC 3 series cylinders. Thus, PHMSA anticipates this revision to have a minimal positive environmental impact. PHMSA does not anticipate an increase to GHG emissions as these revisions will not have an effect on the usage of DOT/TC 3 series cylinders.

9. P-1731 – PHMSA is incorporating by reference an updated version of IME SLP-23 (2021), titled “Recommendations for the Transportation of Explosives, Division 1.5; Ammonium Nitrate Emulsions, Division 5.1; and Combustible Liquids in Bulk Packaging.” As discussed in Sections III and IV of this final rule, this updates a previously approved version of SLP-23 and provides necessary technical updates and regulatory flexibility. As part of the updated SLP-23, IME included packages designed for the safe transportation of Ammonium Nitrate Emulsions. As part of the review of the IME publication, PHMSA determined these packages were adequate for the safe transportation of Ammonium Nitrate Emulsions. Thus, this revision will not have any environmental impacts and will not result in any increase to GHG emissions.

10. P-1732 – PHMSA is amending § 178.601(g) by allowing inner packagings of articles containing UN0012, UN0014, UN0044, and UN0055 to be assembled and transported without further testing provided that the outer packaging of a combination packaging successfully passes the tests in accordance with 49 CFR 178.603 and 178.606, and the gross mass does not exceed that of the tested type. This revision will provide regulatory flexibility to the regulated community without a reduction in safety. For these reasons, PHMSA does not anticipate this revision to have any environmental impacts nor result in any increase to GHG emissions.

11. P-1734 – PHMSA is revising § 172.514(c)(4) by incorporating the provisions in DOT SP-16295, which would add an option for smaller placards for IBCs carrying combustible liquids. In addition, PHMSA is revising § 172.514(c)(1) to allow an option for smaller placards

on portable tanks. As discussed in sections III and IV of this final rule, this revision does not change the safety requirements for the transportation or filling of an IBC. PHMSA expects that this revision will provide regulatory flexibility to the regulated community without a reduction in safety. For these reasons, PHMSA does not anticipate this revision to have any environmental impacts nor result in any increase to GHG emissions.

12. P-1736 – PHMSA is incorporating by reference IME SLP-22 (2019), “Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials.” As discussed in sections III and IV of this final rule, PHMSA conducted a technical review and examined each of these revisions included in SLP-22 (2019) and asserts that these changes will either maintain or enhance safety requirements. Additionally, PHMSA expects that this revision will provide regulatory flexibility to the regulated community without a reduction in safety. The revisions may result in minor positive environmental impacts due to less packaging failures that will increase safety. PHMSA does not anticipate this revision to result in any increase to GHG emissions.

13. P-1738 – PHMSA is modifying the definition of liquid in § 171.8 to include the test for determining fluidity (penetrometer test), prescribed in section 2.3.4 of Annex A of the ADR. As discussed in sections III and IV of this final rule, PHMSA asserts that the revised test is more empirical in nature and provides better understanding of the properties of the tested material and thus, better hazard classification. PHMSA expects that this revision will provide regulatory flexibility to the regulated community by offering an additional test method and will not result in a reduction in safety. As a result, PHMSA does not anticipate this revision to have any environmental impacts nor result in any increase to GHG emissions.

14. P-1744 – PHMSA is incorporating by reference the updated Appendix A of CGA publication C-7 (2020), “Guide to Classification and Labeling of Compressed Gases, Eleventh Edition,” into the HMR at § 171.7(n)(8). As discussed in sections III and IV of this final rule, this revision updates a previously approved version of CGA C-7 and provides necessary

technical updates and regulatory flexibility. PHMSA expects that this revision will provide regulatory flexibility to the regulated community without any reduction in safety. As a result, PHMSA does not anticipate this revision to have any environmental impacts nor result in any increase to GHG emissions.

15. P-1746 – PHMSA is incorporating by reference CGA C-27 (2019), “Standard Procedure to Derate the Service Pressure of DOT 3-Series Seamless Steel Tubes, First Edition.” As discussed in sections III and IV of this final rule, PHMSA has determined that the method for pressure derating of tubes is essentially the same as what is outlined in current PHMSA guidance. PHMSA expects that this revision will provide regulatory flexibility to the regulated community without a reduction in safety. Therefore, PHMSA does not anticipate this revision to have any environmental impacts nor result in any increase to GHG emissions.

16. P-1747 – PHMSA is incorporating by reference CGA C-29 (2019), “Standard for Design Requirements for Tube Trailers and Tube Modules, First Edition,” which would supersede CGA TB-25 (2018), “Design Considerations for Tube Trailers.” As discussed in sections III and IV of this final rule, PHMSA concludes that tube trailers or modules manufactured in accordance with CGA C-29 are less likely to have separation of tubes from the trailer or bundle, resulting in the unintentional release of hazardous materials, when subjected to multidirectional forces that can occur in highway collisions, including rollover accidents. This revision will increase safety for the transportation of hazardous materials in tube trailers because it may reduce the incidence of releases of hazardous materials due to failure of tube mountings. Therefore, this revision may have minimal positive environmental impacts. PHMSA does not anticipate this revision to result in any increase to GHG emissions.

17. P-1748 – PHMSA is incorporating by reference CGA V-9 (2019), “Compressed Gas Association Standard for Compressed Gas Cylinder Valves, Eighth Edition.” As discussed in sections III and IV of this final rule, this revision updates a previously approved version of CGA V-9 and provides necessary technical updates and regulatory flexibility. PHMSA expects that

this revision will provide regulatory flexibility to the regulated community without a reduction in safety. PHMSA does not anticipate this revision to have any environmental impacts nor result in any increase to GHG emissions.

5. ENVIRONMENTAL JUSTICE

Executive Order 12898 (“Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”)⁵⁰ and DOT Order 5610.2C (“Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”) directs Federal agencies to take appropriate and necessary steps to identify and address disproportionately high and adverse effects of Federal actions on the health or environment of minority and low-income populations “[t]o the greatest extent practicable and permitted by law.” DOT Order 5610.2C (“U.S. Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”) establishes departmental procedures for effectuating Executive Order 12898 by promoting and considering environmental justice principles throughout planning and decision-making processes in the development of programs, policies, and activities—including PHMSA rulemaking.

PHMSA has evaluated this final rule under the above Executive order and DOT Order 5610.2C. PHMSA finds the final rule will not cause disproportionately high and adverse human health and environmental effects on minority, low-income, underserved, and other disadvantaged populations and communities. The rulemaking is neither directed toward a particular population, region, or community, nor is it expected to adversely impact any particular population, region, or community. And because the rulemaking would not adversely affect the safe transportation of hazardous materials generally, its revisions will not entail disproportionately high adverse risks for minority populations, low-income populations, or other underserved and other disadvantaged communities.

⁵⁰ 59 FR 7629 (Feb. 16, 1994).

PHMSA submits that the final rule will in fact reduce risks to minority populations, low-income populations, or other underserved and other disadvantaged communities. Because the HMR amendments could avoid the release of hazardous materials and reduce the frequency of delays and returned/resubmitted shipments of hazardous materials resulting from conflict between the current HMR and updated international standards, the final rule will reduce risks to populations and communities—including any minority, low-income, underserved, and other disadvantaged populations and communities—in the vicinity of interim storage sites and transportation arteries and hubs. Additionally, as explained in the above discussion of NEPA, PHMSA anticipates that its HMR amendments will yield minimal GHG emissions reductions, thereby reducing the risks posed by anthropogenic climate change to minority, low-income, underserved, and other disadvantaged populations and communities.

6. AGENCIES CONSULTED

PHMSA has coordinated with the Federal Aviation Administration, the Federal Motor Carrier Safety Administration, the Federal Railroad Administration, and the United States Coast Guard in the development of this final rule. As such, PHMSA did not receive any adverse comments on the amendments in this final rule from these or any other Federal agencies.

7. FINDING OF NO SIGNIFICANT IMPACT

PHMSA finds the adoption of the Final Action Alternative's regulatory amendments will maintain the HMR's current high level of safety for shipments of hazardous materials transported by highway, rail, aircraft, and vessel, and as such finds the HMR amendments in the final rule will have no significant impact on the human environment. PHMSA finds that the Final Action Alternative will avoid adverse safety, environmental justice, and GHG emissions impacts of the No Action Alternative. Furthermore, based on PHMSA's analysis of these provisions described above, PHMSA finds that codification and implementation of this rule will not result in a significant impact to the human environment. This finding is consistent with Executive

Order 14096 (“Revitalizing Our Nation’s Commitment to Environmental Justice for All”)⁵¹ by achieving several goals, including continuing to deepen the Biden-Harris Administration’s whole of Government approach to environmental justice and to better protect overburden communities from pollution and environmental harms.

I. Privacy Act

In accordance with 5 U.S.C. 553(c), DOT solicits comments from the public to better inform any amendments to the HMR considered in this rulemaking. DOT posts these comments, without edit, including any personal information the commenter provides, to www.regulations.gov, as described in the system of records notice (DOT/ALL–14 FDMS). For information on DOT’s compliance with the Privacy Act, please see www.dot.gov/privacy.

J. Executive Order 13609 and International Trade Analysis

Under Executive Order 13609 (“Promoting International Regulatory Cooperation”),⁵² agencies must consider whether the impacts associated with significant variations between domestic and international regulatory approaches are unnecessary or may impair the ability of American business to export and compete internationally. To meet shared challenges involving health, safety, labor, security, environmental, and other issues, international regulatory cooperation can identify approaches that are at least as protective as those that are or would be adopted in the absence of such cooperation. International regulatory cooperation can also reduce, eliminate, or prevent unnecessary differences in regulatory requirements.

Similarly, the Trade Agreements Act of 1979 (Pub. L. 96–39), as amended by the Uruguay Round Agreements Act (Pub. L. 103–465), prohibits Federal agencies from establishing any standards or engaging in related activities that create unnecessary obstacles to the foreign

⁵¹ 88 FR 25251 (April 26, 2023).

⁵² 77 FR 26413 (May 4, 2012).

commerce of the United States. Pursuant to the Trade Agreements Act, the establishment of standards is not considered an unnecessary obstacle to the foreign commerce of the United States, so long as the standards have a legitimate domestic objective, such as providing for safety, and do not operate to exclude imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that these standards form the basis for U.S. standards. PHMSA participates in the establishment of international standards in order to protect the safety of the American public. PHMSA has assessed the effects of this final rule and concludes that it will not cause unnecessary obstacles to foreign trade.

K. Executive Order 13211

Executive Order 13211 (“Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use”)⁵³ requires Federal agencies to prepare a Statement of Energy Effects for any “significant energy action.” Under the Executive order, a “significant energy action” is defined as any action by an agency (normally published in the *Federal Register*) that promulgates, or is expected to lead to the promulgation of, a final rule or regulation (including a notice of inquiry, advanced notice of proposed rulemaking (ANPRM), and NPRM) that: (1)(i) is a significant regulatory action under Executive Order 12866 or any successor order, and (ii) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (2) is designated by the Administrator of the Office of Information and Regulatory Affairs (OIRA) as a significant energy action.

This rulemaking has not been designated as a significant regulatory action and has not been designated by OIRA as a significant energy action. In addition, PHMSA has concluded that this rulemaking will not result in a significant adverse effect on the supply, distribution, or use of energy. Therefore, PHMSA has not prepared an energy impact statement.

⁵³ 66 FR 28355 (May 22, 2001).

L. National Technology Transfer and Advancement Act

The National Technology Transfer and Advancement Act of 1995 (NTTAA; 15 U.S.C. 272 note) directs Federal agencies to use voluntary consensus standards in their regulatory activities unless doing so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., specification of materials, test methods, or performance requirements) that are developed or adopted by voluntary consensus standards bodies. Consistent with the goals of the NTTAA, PHMSA has adopted a significant number of voluntary consensus standards, which are listed in 49 CFR 171.7.

M. Cybersecurity and Executive Order 14028

Executive Order 14028 (“Improving the Nation’s Cybersecurity”)⁵⁴ directs the Federal Government to improve its efforts to identify, deter, and respond to “persistent and increasingly sophisticated malicious cyber campaigns.” PHMSA has considered the effects of the final rule and determined that its regulatory amendments will not materially affect the cybersecurity risk profile for transportation of hazardous materials.

N. Severability

The purpose of this final rule is to operate holistically and, in concert with existing HMR requirements, provide defense-in-depth to ensure safe transportation of hazardous materials. However, PHMSA recognizes that certain provisions focus on unique topics. Therefore, PHMSA finds that the various provisions of this final rule are severable and able to operate functionally if severed from each other. In the event a court were to invalidate one or more of the unique provisions of this final rule, the remaining provisions should stand, thus allowing their continued effect.

⁵⁴ 86 FR 26633 (May 17, 2021).

List of Subjects

49 CFR Part 107

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

49 CFR Part 171

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

49 CFR Part 172

Hazardous materials transportation, Hazardous waste, Incorporation by reference, Labeling, Markings, Packaging and containers, Reporting and recordkeeping requirements.

49 CFR Part 173

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

49 CFR Part 178

Hazardous materials transportation, Incorporation by reference, Motor vehicle safety, 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, Railroad safety, Reporting and recordkeeping requirements.

In consideration of the foregoing, PHMSA amends 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. 5101–5128, 44701; Pub. L. 101–410 Section 4; Pub. L. 104–121 Sections 212–213; Pub. L. 104–134 Section 31001; Pub. L. 114–74 Section 701 (28 U.S.C. 2461 note); 49 CFR 1.81 and 1.97; 33 U.S.C. 1321.

2. In § 107.117, revise paragraph (a) to read as follows:

§ 107.117 Emergency processing.

(a) An application is granted emergency processing if the Associate Administrator, on the basis of the application and any inquiry undertaken, finds that:

(1) Emergency processing is necessary to prevent significant injury to persons or property (other than the hazardous material to be transported) that could not be prevented if the application were processed on a routine basis;

(2) Emergency processing is necessary for immediate national security purposes;

(3) Emergency processing is necessary to prevent significant economic loss that could not be prevented if the application were processed on a routine basis; or

(4) Emergency processing is necessary in support of an essential governmental (domestic or foreign) function that could not be satisfied if the application were processed on a routine basis.

* * * * *

PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

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

Authority: 49 U.S.C. 5101–5128, 44701; Pub. L. 101–410 section 4; Pub. L. 104–134, section 31001; Pub. L. 114–74 section 701 (28 U.S.C. 2461 note); 49 CFR 1.81 and 1.97.

4. In § 171.7:

a. Revise paragraphs (n) and (r);

b. In paragraph (dd)(4) introductory text, remove the text “§ 171.23” and add in its place the text “§§ 171.8; 171.23”;

c. Add paragraph (dd)(5); and

d. In table 1 to the section, add a main entry for “*Department of Commerce, 1401 Constitution Ave NW, Washington, DC 20230:*” in alphabetical order followed by the sub-entry “*Federal Standard H-28, Screw-Thread Standards for Federal Services*”.

The revisions and additions read as follows:

§ 171.7 Reference material.

* * * * *

(n) *Compressed Gas Association (CGA)*, 8484 Westpark Drive, Suite 220, McLean, VA 22102; telephone 703-788-2700, www.cganet.com.

(1) CGA C-1 - 2016 (CGA C-1), *Methods for Pressure Testing Compressed Gas Cylinders*, Eleventh Edition, copyright 2016; into §§178.36; 178.37; 178.38; 178.39; 178.42; 178.44; 178.45; 178.46; 178.47; 178.50; 178.51; 178.53; 178.55; 178.56; 178.57; 178.58; 178.59; 178.60; 178.61; 178.65; 178.68; 180.205; 180.209.

(2) CGA C-3 - 2005 (Reaffirmed 2011) (CGA C-3), *Standards for Welding on Thin-Walled Steel Cylinders*, Seventh Edition, copyright 2005; into §§178.47; 178.50; 178.51; 178.53; 178.55; 178.56; 178.57; 178.58; 178.59; 178.60; 178.61; 178.65; 178.68; 180.211.

(3) CGA C-5 (CGA C-5), *Cylinder Service Life—Seamless Steel High Pressure Cylinders*, 1991 (Reaffirmed 1995); into §173.302a.

(4) CGA C-6 - 2013 (CGA C-6), *Standards for Visual Inspection of Steel Compressed Gas Cylinders*, Eleventh Edition, copyright 2013; into §§172.102; 173.3; 173.198; 180.205; 180.209; 180.211; 180.411; 180.519.

(5) CGA C-6.1 - 2013 (CGA C-6.1), *Standards for Visual Inspection of High Pressure Aluminum Compressed Gas Cylinders*, Sixth Edition, copyright 2013 (corrected 4/14/2015); into §§180.205; 180.209.

(6) CGA C-6.2 (CGA C-6.2), *Guidelines for Visual Inspection and Requalification of Fiber Reinforced High Pressure Cylinders*, Third Edition, 1996; into §180.205.

(7) CGA C-6.3 - 2013 (CGA C-6.3), Standard for Visual Inspection of Low Pressure Aluminum Alloy Compressed Gas Cylinders, Third Edition, copyright 2013; into §§180.205; 180.209.

(8) CGA C-7 - 2020 (CGA C-7), Guide to Classification and Labeling of Compressed Gases; Eleventh Edition, 2020 (corrected May 6, 2020); into § 172.400a.

(9) CGA C-8 (CGA C-8), Standard for Requalification of DOT-3HT Cylinder Design, 1985; into §§180.205; 180.209.

(10) CGA C-11 - 2013 (CGA C-11), Practices for Inspection of Compressed Gas Cylinders at Time of Manufacture, Fifth Edition, copyright 2013; into §178.35.

(11) CGA C-12 (CGA C-12), Qualification Procedure for Acetylene Cylinder Design, 1994; into §§173.301; 173.303; 178.59; 178.60.

(12) CGA C-13 (CGA C-13), Guidelines for Periodic Visual Inspection and Requalification of Acetylene Cylinders, Fourth Edition, 2000; into §§ 173.303; 180.205; 180.209.

(13) CGA C-14 - 2005 (Reaffirmed 2010) (CGA C-14), Procedures for Fire Testing of DOT Cylinder Pressure Relief Device Systems, Fourth Edition, copyright 2005; into §§173.301; 173.323.

(14) CGA C-20 - 2014 (CGA C-20), Requalification Standard for Metallic, DOT and TC 3-series Gas Cylinders and Tubes Using Ultrasonic Examination, Second Edition, 2014; into § 180.205.

(15) CGA C-23 - 2018 (CGA C-23), Standard for Inspection of DOT/TC 3 Series and ISO 11120, Tube Neck Mounting Surfaces, Second Edition, 2018; into §§ 180.205; 180.207.

(16) CGA C-27 - 2019 (CGA C-27), Standard Procedure to Derate the Service Pressure of DOT Series Seamless Steel Tubes, First Edition, 2019; into § 180.212.

(17) CGA C-29 – 2019, (Formerly TB-25) (CGA C-29), Standard for Design Requirements for Tube Trailers and Tube Modules, First Edition, 2019; into § 173.301.

(18) CGA G-1.6 - 2011 (CGA G -1.6), Standard for Mobile Acetylene Trailer Systems, Seventh Edition, copyright 2011; into §173.301.

(19) CGA G-2.2 (CGA G-2.2), Guideline Method for Determining Minimum of 0.2% Water in Anhydrous Ammonia, Second Edition, 1985 (Reaffirmed 1997); into §173.315.

(20) CGA G-4.1 (CGA G-4.1), Cleaning Equipment for Oxygen Service, 1985; into §178.338-15.

(21) CGA P-20 (CGA P-20), Standard for the Classification of Toxic Gas Mixtures, Third Edition, 2003; into §173.115.

(22) CGA S-1.1 - 2011 (CGA S-1.1), Pressure Relief Device Standards—Part 1—Cylinders for Compressed Gases; Fourteenth Edition, copyright 2011; into §§173.301; 173.304a; 178.75.

(23) CGA S-1.2 (CGA S-1.2), Safety Relief Device Standards Part 2—Cargo and Portable Tanks for Compressed Gases, 1980; into §§173.315; 173.318; 178.276; 178.277.

(24) CGA S-7 - 2013 (CGA S-7), Standard for Selecting Pressure Relief Devices for Compressed Gas Mixtures in Cylinders, Fifth Edition, copyright 2013; into §173.301.

(25) CGA Technical Bulletin TB-2, Guidelines for Inspection and Repair of MC-330 and MC-331 Cargo Tanks, 1980; into §§180.407; 180.413.

(26) CGA Technical Bulletin TB-25 (CGA TB-25), Design Considerations for Tube Trailers, 2008 Edition; into § 173.301.

(27) CGA V-9 - 2019, Compressed Gas Association Standard for Compressed Cylinder Valves, Eighth Edition, 2019; into §173.301.

* * * * *

(r) *Institute of Makers of Explosives (IME)*, 1212 New York Avenue, NW, #650, Washington, DC 20005, Phone: 202-429-9280.

(1) IME SLP-22, Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials, 2019, (IME Standard 22); into §§ 173.63; 177.835.

(2) IME SLP-23, Recommendations for the Transportation of Explosives, Division 1.5, Ammonium Nitrate Emulsions, Division 5.1, Combustible Liquids, Class 3, and Corrosives, Class 8 in Bulk Packaging, March 2021, (IME Standard 23); into §§ 172.102 173.66; 173.251; 177.835.

* * * * *

(dd) * * *

(5) UN/SCETDG/55/INF.27, United Nations’ Recommendations on Test Series 8: Applicability of Test Series 8(d), June 14, 2019; into § 172.102(c)(1), special provision 148.

Table 1 to 49 CFR 171.7—Materials Not Incorporated by Reference

* * *	* * * *
<i>Department of Commerce, 1401 Constitution Ave NW, Washington, DC 20230:</i>	
Federal Standard H-28, Screw-Thread Standards for Federal Services	180.212
* * *	* * * *

5. In § 171.8, revise the definition of “Liquid” to read as follows:

§ 171.8 Definitions and abbreviations.

* * * * *

Liquid means a material, other than an elevated temperature material, with a melting point or initial melting point of 20 °C (68 °F) or lower at a standard pressure of 101.3 kPa (14.7 psia). A viscous material for which a specific melting point cannot be determined must be subjected to the procedures specified in ASTM D 4359 (IBR, see § 171.7) or to the test for determining fluidity (penetrometer test) prescribed in section 2.3.4 of Annex A of the European

Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) (IBR, see § 171.7).

* * * * *

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

6. The authority citation for part 172 continues to read as follows:

Authority: 49 U.S.C. 5101-5128, 44701; 49 CFR 1.81, 1.96 and 1.97.

7. In § 172.101, the Hazardous Materials Table is amended by revising the entries under “[REVISE]” to read as follows:

§ 172.101 Purpose and use of hazardous materials table.

* * * * *

§172.101 Hazardous Materials Table

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification Numbers	(5) PG	(6) Label Codes	(7) Special Provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)		(10) Vessel stowage	
							(8A) Exceptions	(8B) Non - bulk	(8C) Bulk	(9A) Passenger aircraft/rail	(9B) Cargo aircraft only	(10A) Location	(10B) Other
	[REVISE]												

	Ammonium nitrate emulsion <i>or</i> Ammonium nitrate suspension <i>or</i> Ammonium nitrate gel, <i>intermediate for blasting explosives</i>	5.1	UN3375	II	5.1	147, 148, 163, IB2, IP16, TP48	None	231	251	Forbidden	Forbidden	D	25, 59, 60, 66, 124

	Explosive, blasting, type E <i>or</i> Agent blasting, type E	1.5D	UN0332		1.5D	105, 106, 148, TP48	None	62	None	Forbidden	Forbidden	03	25, 19E

G	Oxidizing liquid, n.o.s.	5.1	UN3139	I	5.1	62, 127, A2	None	201	243	Forbidden	2.5 L	D	56, 58, 138
				II	5.1	62, 127, 148, A2, IB2, TP48	152	202	242	1 L	5 L	B	56, 58, 138
				III	5.1	62, 127, 148, A2, IB2	152	203	241	2.5 L	30 L	B	56, 58, 138

* * * * *

8. In § 172.102:

- a. In paragraph (c)(1), revise special provision 148; and
- b. In paragraph (c)(8)(ii), add special provision TP48 in numerical order.

The revision and addition read as follows:

§172.102 Special provisions.

* * * * *

(c) * * *

(1) * * *

148 For domestic transportation, this entry directs to § 173.66 of this subchapter for:

a. The standards for transporting a single bulk hazardous material for blasting by cargo tank motor vehicles (CTMV); and

b. The standards for CTMVs capable of transporting multiple hazardous materials for blasting in bulk and non-bulk packagings (i.e., a multipurpose bulk truck). Note: “UN3375, Ammonium nitrate emulsion” and “UN0332, Explosive, blasting, type E *or* Agent blasting, type E” are subject to the United Nations (UN) Test Series 8(d) (UN/SCETDG/55/INF.27) (IBR, see § 171.7 of this subchapter), otherwise known as the Vented Pipe Test (VPT).

* * * * *

(8) * * *

(ii) * * *

TP48 The use of IM 101 and 102 portable tanks when transported in accordance with IME Standard 23 (IBR, see § 171.7 of this subchapter).

* * * * *

9. In § 172.514, revise paragraphs (c)(1) and (4) to read as follows:

§ 172.514 Bulk packagings.

* * * * *

(c) * * *

(1) A portable tank having a capacity of less than 3,785 L (1,000 gallons). Additionally, portable tanks containing a combustible liquid may be placarded with a combustible placard that meets the label specifications for size in § 172.407(c). However, a transport vehicle containing portable tanks with a reduced-size combustible placard is still required to conform to the placarding requirements in this subpart, including the size requirements in § 172.519(c);

* * * * *

(4) For an intermediate bulk container (IBC) labeled in accordance with subpart E of this part, the IBC may display the proper shipping name and UN identification number markings in accordance with § 172.301(a)(1) in place of the UN number on an orange panel, placard, or white square-on-point configuration as prescribed in § 172.336(d). Additionally, IBCs containing a combustible liquid may be placarded with a combustible placard that meets the label specifications for size in § 172.407(c). However, a transport vehicle containing IBCs with a reduced-size combustible placard is still required to conform to the placarding requirements in this subpart, including the size requirements in § 172.519(c); and

* * * * *

PART 173 – SHIPPERS - GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

10. The authority citation for part 173 continues to read as follows:

Authority: 49 U.S.C. 5101-5128, 44701; 49 CFR 1.81, 1.96 and 1.97.

11. In § 173.4b, revise the introductory text to paragraph (a) to read as follows:

§ 173.4b De minimis exceptions.

(a) When packaged in accordance with this section, the following materials do not meet the definition of a hazardous material in § 171.8 of this subchapter and, therefore, are not subject to the requirements of this subchapter: Packing Group I materials of hazard Division 6.1 (no inhalation hazard), and Packing Group II and III materials of hazard Class 3, Division 4.1, Division 4.2, Division 4.3, Division 5.1, Division 6.1, Class 8, and Class 9.

* * * * *

12. In § 173.115, revise the introductory text to paragraph (e) to read as follows:

§ 173.115 Class 2, Divisions 2.1, 2.2, and 2.3—Definitions.

* * * * *

(e) *Liquefied compressed gas.* A gas, which when packaged under pressure for transportation is partially liquid at temperatures above $-50\text{ }^{\circ}\text{C}$ ($-58\text{ }^{\circ}\text{F}$), is considered to be a liquefied compressed gas. Gas mixtures with component(s) that are liquefied gases may be described using the hazardous materials description of a compressed gas in the Hazardous Materials Table in § 172.101 of this subchapter when the partial pressure(s) of the liquefied gas component(s) in the mixture are reduced so that the mixture is entirely in the gas phase at $20\text{ }^{\circ}\text{C}$ ($68\text{ }^{\circ}\text{F}$). A liquefied compressed gas is further categorized as follows:

* * * * *

13. In §173.185, revise the introductory text to paragraph (c)(3) to read as follows:

§ 173.185 Lithium cells and batteries.

* * * * *

(c) * * *

(3) *Lithium battery mark.* Each package must display the lithium battery mark except when a package contains only button cell batteries contained in equipment (including circuit boards), or when a consignment contains two packages or fewer where each package contains not more than four lithium cells or two lithium batteries contained in equipment.

* * * * *

14. In § 173.251, add paragraph (b) to read as follows:

§ 173.251 Bulk packaging for ammonium nitrate emulsion, suspension, or gel.

* * * * *

(b) *Portable tanks*. This section does not apply to “UN3375, Ammonium nitrate emulsion” when transported in IM 101 or 102 portable tanks in accordance with IME Standard 23 (IBR, see §171.7 of this subchapter).

15. In § 173.301, revise the section heading and paragraph (i)(2) 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.

* * * * *

(i) * * *

(2) Seamless DOT specification cylinders longer than 2 m (6.5 ft) are authorized for transportation only when horizontally mounted on a motor vehicle or in an ISO framework or other framework of equivalent structural integrity in accordance with CGA C-29 (IBR, see §171.7 of this subchapter). Seamless DOT specification cylinders longer than 2 m (6.5 ft) manufactured prior to May 11, 2009, may continue to use CGA TB-25 (IBR, see §171.7 of this subchapter). The pressure relief device must be arranged to discharge unobstructed to the open air. In addition, for Division 2.1 (flammable gas) material, the pressure relief devices must be arranged to discharge upward to prevent any escaping gas from contacting personnel or any adjacent cylinders.

* * * * *

16. In § 173.302a:

- a. Revise the section heading;
- b. Remove the semicolons at the ends of paragraphs (c)(1) and (2) and add periods in their places;
- c. Revise paragraphs (c)(3) and (4); and
- d. Add paragraphs (c)(5) through (7).

The revisions and additions read as follows:

§173.302a Additional requirements for shipment of non-liquefied (permanent) compressed gases in specification cylinders.

* * * * *

(c) * * *

(3) DOT specification 3A and 3AX cylinders are limited to those having an intermediate manganese composition.

(4) Cylinders manufactured with intermediate manganese steel must have been normalized, not quenched and tempered. Quench and temper treatment of intermediate steel is not authorized.

(5) Cylinders manufactured with chrome moly steel must have been quenched and tempered, not normalized. Use of normalized chrome moly steel cylinders is not permitted.

(6) Cylinders must be equipped with pressure relief devices sized and selected as to type, location, and quantity, and tested in accordance with § 173.301(f).

(7) A plus sign (+) is added following the test date marking on the cylinder.

* * * * *

17. In § 173.302b, add paragraph (f) to read as follows:

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

* * * * *

(f) *Methane, compressed, or natural gas, compressed, UN1971*. Methane, compressed, or natural gas, compressed, is authorized in a UN seamless steel pressure receptacle under the following conditions:

(1) For methane, and for natural gas with a methane content of 98.0 percent or greater—

(i) The maximum tensile strength of the UN seamless steel pressure receptacle may not exceed 1100 MPa (159,542 psi); and

(ii) The contents are commercially free of corroding components.

(2) For natural gas with a methane content of less than 98.0 percent—

(i) The maximum tensile strength of the UN seamless steel pressure receptacle may not exceed 950 MPa (137,750 psi);

(ii) Each discharge end of a UN refillable seamless steel tube must be equipped with an internal drain tube; and

(iii) The moisture content and concentration of the corroding components must conform to the requirements in § 173.301b(a)(2).

PART 178—SPECIFICATIONS FOR PACKAGINGS

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

Authority: 49 U.S.C. 5101-5128; 49 CFR 1.81 and 1.97.

19. In § 178.601:

a. Redesignate paragraphs (g)(6) through (8) as paragraphs (g)(7) through (9);

b. Add new paragraph (g)(6); and

c. Revise newly redesignated paragraph (g)(8).

The addition and revision read as follows:

§ 178.601 General requirements.

* * * * *

(g) * * *

(6) *Selective testing of combination packagings for articles containing small arms ammunition: Variation 6.* Variations in inner and intermediate packagings are permitted in packages for articles containing Cartridges, small arms (UN0012); Cartridges for tools, blank (UN0014); Primers, cap type (UN0044); and Cases, cartridge empty with primer (UN0055) packed in inner packages without further testing of the package under the following conditions:

(i) The package has been tested containing only the articles to be transported without intermediate containment;

(ii) The outer packaging must have passed the stacking test set forth in § 178.606 when empty, i.e., without cushioning or inner or intermediate packagings, with the test mass of identical packages being the mass of the package filled with the articles;

(iii) Only articles tested without intermediate containment may be transported; however, a variety of articles tested in this fashion may be assembled in a package with intermediate containment;

(iv) No articles demonstrate a loss of material in testing; and

(v) The completed package does not exceed the marked maximum gross mass of the package.

* * * * *

(8) *Approval of selective testing.* In addition to the provisions of paragraphs (g)(1) through (7) of this section, the Associate Administrator may approve the selective testing of packagings that differ only in minor respects from a tested type.

* * * * *

PART 180—CONTINUING QUALIFICATION AND MAINTENANCE OF PACKAGINGS

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

Authority: 49 U.S.C. 5101-5128; 49 CFR 1.81 and 1.97.

21. In § 180.205:

- a. Add paragraph (c)(5);
- b. Remove the word “or” at the end of paragraph (d)(4);
- c. Redesignate paragraph (d)(5) as paragraph (d)(6) and add new paragraph (d)(5);
- d. Revise paragraphs (e)(2) and (f);
- e. Redesignate paragraphs (h) through (j) as paragraphs (i) through (k) and add new paragraph (h); and
- f. Revise newly redesignated paragraphs (i)(1), (j)(2)(i)(C), and (j)(3).

The additions and revisions read as follows:

§ 180.205 General requirements for requalification of specification cylinders.

* * * * *

(c) * * *

(5) Each 3-series specification cylinder that is horizontally mounted on a motor vehicle or in a framework and that is: 12 feet or longer; has an outside diameter greater than or equal to 18 inches; and is supported by the neck mounting surface during transportation in commerce must be inspected at the time of requalification in accordance with CGA C-23 (IBR, see §171.7 of this subchapter).

(d) * * *

(5) For a cylinder subject to paragraph (c)(5) of this section, if there is visible corrosion around the neck or under the flange/sleeve, as outlined in Section 4.2 of CGA C-23, it must be removed and examined in accordance with CGA C-23 before being returned to service; or

* * * * *

(e) * * *

(2) Requalified in accordance with this section, regardless of the date of the previous requalification. When requalification is performed using ultrasonic examination, the cylinder must be visually inspected in accordance with paragraph (e)(1) of this section;

* * * * *

(f) *Visual inspection.* Except as otherwise provided in this subpart, each time a cylinder is pressure tested, it must be given an internal and external visual inspection.

(1) The visual inspection must be performed in accordance with the following standards (all IBR, see § 171.7 of this subchapter): CGA C-6 for steel and nickel cylinders; CGA C-6.1 for seamless aluminum cylinders; CGA C-6.2 for fiber reinforced composite special permit cylinders; CGA C-6.3 for low pressure aluminum cylinders; CGA C-8 for DOT 3HT cylinders; and CGA C-13 for DOT 8 series cylinders.

(2) If a cylinder or tube is requalified by ultrasonic examination, only an external visual inspection is required.

(3) For each cylinder with a coating or attachments that would inhibit inspection of the cylinder, the coating or attachments must be removed before performing the visual inspection.

(4) Each cylinder subject to visual inspection must be approved, rejected, or condemned according to the criteria in the applicable CGA standard.

(5) In addition to other requirements prescribed in this paragraph (f), each specification cylinder manufactured of aluminum alloy 6351-T6 and used in self-contained underwater breathing apparatus (SCUBA), self-contained breathing apparatus (SCBA), or oxygen service must be inspected for sustained load cracking in accordance with appendix C to this part at the first scheduled five-year requalification period after January 1, 2007, and every five years thereafter.

(6) Except in association with an authorized repair, removal of wall thickness via grinding, sanding, or other means is not permitted. Removal of paint or loose material to prepare the cylinder for inspection is permitted (i.e., shot blasting).

(7) Chasing of cylinder threads to clean them is permitted, but removal of metal must not occur. Re-tapping of cylinder threads is not permitted, except by the original manufacturer, as provided in § 180.212.

* * * * *

(h) *Ultrasonic examination (UE)*. Requalification of cylinders and tubes using UE must be performed in accordance with CGA C-20 (IBR, see §171.7 of this subchapter).

(i) * * *

(1) Except as provided in paragraphs (i)(3) and (4) of this section, a cylinder that is rejected may not be marked as meeting the requirements of this section.

* * * * *

(j) * * *

(2) * * *

(i) * * *

(C) As an alternative to the stamping or labeling as described in this paragraph (j)(2), at the direction of the owner, the requalifier may render the cylinder incapable of holding pressure. If a condemned cylinder contains hazardous materials, the requalifier must stamp the cylinder “CONDEMNED” and affix a readily visible label on the cylinder stating: “UN REJECTED, RETURNING TO ORIGIN FOR PROPER DISPOSITION.” The requalifier may only transport the condemned cylinder by private motor vehicle carriage to a facility capable of safely removing the contents of the cylinder.

* * * * *

(3) No person may remove, obliterate, or alter the required condemnation communication of paragraph (j)(2) of this section.

* * * * *

22. In § 180.207, revise paragraph (d)(1) to read as follows:

§ 180.207 Requirements for requalification of UN pressure receptacles.

* * * * *

(d) * * *

(1) *Seamless steel*. (i) Each seamless steel UN pressure receptacle, including pressure receptacles exceeding 150 L capacity installed in multiple-element gas containers (MEGCs) or in

other service, must be requalified in accordance with ISO 6406:2005(E) (IBR, see §171.7 of this subchapter). However, UN cylinders with a tensile strength greater than or equal to 950 MPa must be requalified by ultrasonic examination in accordance with ISO 6406:2005(E). For seamless steel cylinders and tubes, the internal inspection and hydraulic pressure test may be replaced by a procedure conforming to ISO 16148:2016(E) (IBR, see §171.7 of this subchapter).

(ii) Each seamless steel UN pressure receptacle that is horizontally mounted on a motor vehicle or in a framework and that: is 12 feet or longer; has an outside diameter greater than or equal to 18 inches; and is supported by a neck mounting surface during transportation must be inspected at the time of requalification in accordance with CGA C-23 (IBR, see § 171.7 of this subchapter). Notwithstanding the periodic inspection, if the seamless steel UN pressure receptacle shows visible corrosion, as outlined in Section 4.2 of CGA C-23, around the neck or under the flange/sleeve, then it must be removed and examined in accordance with Section 6 of CGA C-23 prior to returning to service.

* * * * *

23. In § 180.209:

- a. Revise table 1 to paragraph (a) and paragraph (d); and
- b. In paragraph (m), revise the introductory text and the heading of the table.

The revisions read as follows:

§180.209 Requirements for requalification of specification cylinders.

(a) * * *

Table 1 to Paragraph (a) – Requalification of Cylinders¹

Specification under which cylinder was made	Minimum test pressure (psig) ²	Requalification period (years)
3	3000 psig	5.
3A, 3AA	5/3 times service pressure, except non-corrosive service (see §180.209(g))	5, 10, or 12 (see §180.209(b), (f), (h), and (j)).
3AL	5/3 times service pressure	5 or 12 (see §180.209(j) and (m) ⁴).
3AX, 3AAX	5/3 times service pressure	5.
3B, 3BN	2 times service pressure (see §180.209(g))	5 or 10 (see §180.209(f)).
3E	Test not required	

3HT	5/3 times service pressure	3 (<i>see</i> §§180.209(k) and 180.213(c)).
3T	5/3 times service pressure or UE ³	5.
4AA480	2 times service pressure (<i>see</i> §180.209(g))	5 or 10 (<i>see</i> §180.209(h)).
4B, 4BA, 4BW, 4B-240ET	2 times service pressure, except non-corrosive service (<i>see</i> §180.209(g))	5, 7, 10, or 12 (<i>see</i> §180.209(e), (f), and (j)).
4D, 4DA, 4DS	2 times service pressure	5.
4E	2 times service pressure, except non-corrosive service (<i>see</i> §180.209(g))	5, 10, or 12 (<i>see</i> §180.209(e)).
4L	Test not required	
8, 8AL		10 or 20 (<i>see</i> §180.209(i)).
Exemption or special permit cylinder	See current exemption or special permit, or UE ³ as allowed by CGA C-20 (2014)	See current exemption or special permit.
Foreign cylinder (<i>see</i> §173.301(j) of this subchapter for restrictions on use)	As marked on cylinder, but not less than 5/3 of any service or working pressure marking	5 (<i>see</i> §§180.209(l) and 180.213(d)(2)).

¹ Any cylinder not exceeding two inches outside diameter and less than two feet in length is excepted from volumetric expansion test.

² For cylinders not marked with a service pressure, see § 173.301a(b) of this subchapter.

³ Minimum test pressure is not applicable to those cylinders and tubes requalified using ultrasonic examination.

⁴ This provision does not apply to cylinders used for carbon dioxide, fire extinguisher, or other industrial gas service.

* * * * *

(d) *Cylinders 5.44 kg (12 lb) or less with service pressures of 300 psig or less.* A cylinder of 5.44 kg (12 lb) or less water capacity authorized for service pressure of 300 psig or less must be given a complete external visual inspection at the time periodic requalification becomes due. External visual inspection must be in accordance with CGA C-6 or CGA C-6.1 (IBR, *see* § 171.7 of this subchapter). The cylinder may be proof pressure tested. The test is successful if the cylinder, when examined under test pressure, does not display a defect described in § 180.205(j)(1)(ii) or (iii). Upon successful completion of the test and inspection, the cylinder must be marked in accordance with § 180.213.

* * * * *

(m) *DOT-3AL cylinders manufactured of 6351-T6 aluminum alloy.* In addition to the periodic requalification and marking described in § 180.205, each cylinder manufactured of aluminum alloy 6351-T6 used in self-contained underwater breathing apparatus (SCUBA), self-contained breathing apparatus (SCBA), or oxygen service must be requalified and inspected for sustained load cracking in accordance with the non-destructive examination method described in the following table. Each cylinder with sustained load cracking that has expanded into the neck

threads must be condemned in accordance with § 180.205(j). This paragraph (m) does not apply to cylinders used for carbon dioxide, fire extinguisher, or other industrial gas service.

Table 4 to Paragraph (m) – Requalification and Inspection of DOT-3AL Cylinders Made of
Aluminum Alloy 6351–T6

* * * * *

24. In § 180.212, add paragraph (a)(4) and revise paragraph (b)(2) to read as follows:

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

(a) * * *

(4) DOT 3-series seamless steel tubes with an outside diameter greater than 9 5/8 in (244.5 mm) may be processed by a repair facility for derating the marked service pressure in accordance with CGA C-27 (IBR, see § 171.7 of this subchapter).

(b) * * *

(2) External rethreading of a DOT 3AX, 3AAX, or 3T specification cylinder or a UN pressure receptacle, and external threading of a seamless DOT 3AX, 3AAX, or 3T specification cylinder or seamless UN pressure receptacle originally manufactured without external threads; or the internal rethreading of a DOT-3 series cylinder or a seamless UN pressure receptacle when performed by a cylinder manufacturer of these types of cylinders. The repair work must be performed under the supervision of an independent inspection agency. Upon completion of the rethreading or post-manufacture threading, the threads must be gauged in accordance with Federal Standard H-28 or an equivalent standard containing the same specification limits. The rethreaded cylinder or UN pressure receptacle must be stamped clearly and legibly with the words “RETHREAD” and a post-manufacture threaded cylinder or UN pressure receptacle must be stamped clearly and legibly with the words “POST-THREAD”, on the shoulder, top head, or neck. No DOT specification cylinder or UN pressure receptacle may be rethreaded more than one time without approval of the Associate Administrator.

Signed in Washington, D.C. on February 13, 2024, under authority delegated in
49 CFR 1.97(b).

Tristan H. Brown,

Deputy Administrator,

Pipeline and Hazardous Materials Safety Administration.

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