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PHMSA Seeks Comment on Initiatives to Modernize the HMR

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On July 5, 2023, the Pipeline and Hazardous Materials Safety Administration (PHMSA) published an advance notice of proposed rulemaking (ANPRM) to solicit stakeholder feedback on initiatives PHMSA is considering that may modernize the Hazardous Materials Regulations (HMR) and improve efficiencies while maintaining or improving a current high level of safety. 88 Fed. Reg. 43016. To engage fully with stakeholders, the ANPRM solicits comments and input on questions related to 46 distinct topics under consideration. PHMSA states that it will use any comments, data, and information received "to evaluate and potentially draft proposed amendments." Comments are due **October 3, 2023**. PHMSA notes that it "will consider late-filed comments to the extent possible."

This memorandum provides more information on several of the topics under consideration: non-bulk packaging, intermediate bulk container (IBC), and large packaging periodic retest extension; aerosol classification alignment; requirements for damaged, defective, or recalled lithium cells and batteries; and 49 C.F.R. Section 173.150 ethyl alcohol exception. It includes highlights of PHMSA's questions on these topics. Stakeholders should review the notice for the complete list of questions as well as the other topics addressed by the notice.

Non-Bulk Packaging, IBC, and Large Packaging Periodic Retest Extension

PHMSA states that packaging standards for United Nations (UN) Performance Oriented Packagings (POP), also referred to as UN specification packagings, IBCs, and Large Packagings, "are performance-based, rather than highly prescriptive." The HMR provide general standards and instructions for the construction of UN specification packagings and IBCs in 49 C.F.R. Part 178, Subparts L and N, respectively. To be qualified to bear a UN specification packaging mark, each non-bulk packaging or IBC design must pass qualification tests in Part 178, Subparts M and O, respectively, however. After a design has been initially qualified, the HMR require that each non-bulk single packaging design and IBC design must undergo a periodic retest at least every 12 months. Each non-bulk combination packaging design and Large Packaging design must undergo periodic retest at least every 24 months. These tests are intended to demonstrate that the manufacturer's packagings continue to meet the standards required for the safe transportation of hazardous materials.

The Research and Special Programs Administration (RSPA), PHMSA's predecessor agency, adopted UN POP standards into the HMR on December 21, 1990, in a rulemaking known as HM-181

(55 Fed. Reg. 52402). The UN POP system replaced the existing system of heavily prescriptive packaging requirements.

According to PHMSA, those prescriptive requirements accommodated limited innovation in package design and qualification and contributed to a sizable code of regulations through unnecessary duplication of regulatory text. At the time the UN POP standards were proposed, RSPA received comments opposed to periodic packaging testing requirements after initial qualification. Commenters specifically requested that no "requalification" testing be required unless a design change was made to the packaging because of the time and expense involved in annually testing packagings. In response to these comments, RSPA stated its understanding that conducting periodic packaging testing every 12 months was not, by itself, sufficient to ensure each packaging produced by a manufacturer would meet the required performance standards. RSPA stated the expectation that manufacturers would need to take additional measures, such as testing an increased number of samples or testing samples to more stringent levels (*e.g.*, higher drops or increased hydrostatic test pressures) and implementing quality control programs to ensure that each packaging they produced met the UN POP standards.

Additionally, according to PHMSA, RSPA noted that a 12-month periodic retesting requirement was a relaxation of testing requirements for many packaging types, compared to the previous packaging standards in the HMR. RSPA acknowledged that this requirement would be particularly onerous for manufacturers of non-bulk combination packagings because of the large number of very similar designs in production, however, and therefore allowed a number of variations in package design that would not require retesting and extended the periodic retest requirement to 24 months for non-bulk combination packagings.

PHMSA notes that several comments related to the periodic retest requirement for UN specification non-bulk packagings and IBCs were submitted to the 2017 Regulatory Reform Notice docket. The Reusable Industrial Packaging Association (RIPA), the Industrial Packaging Alliance of North America (IPANA), and the Sporting Arms and Ammunition Manufacturers Institute (SAAMI) requested that PHMSA extend the periodic retesting interval to up to five years for UN specification non-bulk packagings and IBCs to align with international standards that permit longer retest intervals and to reflect the higher quality manufacturing practices now in place in the packaging industry. After the comment period for the 2017 Regulatory Reform Notice closed, IPANA submitted a petition for rulemaking, P-1713, and SAAMI submitted a petition designated P-1732 reiterating its request.

PHMSA notes that, unlike many other countries, when the UN POP standards were adopted into the HMR, it did not require that packaging manufacturers send their packagings to an independent third-party laboratory for design qualification and periodic retesting. Rather, it allowed, and continues to allow, non-bulk UN specification packaging and IBC manufacturers to "self-certify" their own packagings by conducting the required tests and recording the results. PHMSA is requesting comment on the following questions to evaluate RIPA, IPANA, and SAAMI's requests:

1. Can a package manufacturer or a UN Third-Party Packaging Certification Agency demonstrate through data, modeling, or other means, that a packaging design that is tested every 60 months performs as well as a design tested every 12 to 24 months?

2. How have manufacturers' quality assurance procedures evolved and improved since the implementation of the UN POP system? Please provide specific examples for all packaging types believed to warrant a longer design qualification interval.

3. For trade associations that represent packaging manufacturers, what percentage of packaging manufacturers in the United States have implemented improved quality assurance procedures for UN POP (non-bulk, Large Packagings, and IBCs) since the current system was adopted in the HMR in 1990?

4. For trade associations and packaging manufacturers, how frequently are internal quality control tests conducted by manufacturers?

5. Are there similar quality control methods used for all the different types of packagings (*e.g.*, steel drums, fiberboard boxes, or composite IBCs)? If not, how do the quality control methods differ by packaging type?

6. For trade associations that represent packaging manufacturers, or packaging manufacturers, how many non-bulk, Large Packaging, and IBC packaging designs are currently in production in the United States? Please provide information by type and whether the packagings are single packagings or combination packagings (*e.g.*, 5,000 combination package 4G fiberboard box designs or 1,500 single package 1A1 non-removable head steel drum designs).

7. Of the current UN POP designs in production in the United States, what percentage(s) are variations on tested designs produced without further testing under Section 178.601(g)?

8. What is the cost of periodic retesting of a packaging for self-certifiers (*i.e.*, manufacturers who certify their own packagings)? Please provide information by type (*e.g.*, $1,000 for a 4G combination package fiberboard box design or $3,500 for a composite IBC design).

9. What is the total cost of a non-bulk, Large Packaging, and IBC packaging periodic recertification for manufacturers who use UN Third-Party Packaging Certification Agencies to certify their packagings? Please provide information by type (*e.g.*, $1,000 to recertify a 4G combination packaging fiberboard box design or $3,500 to recertify a composite IBC design).

10. Given the variability in packaging types encompassed by non-bulk, Large Packaging, IBC POP standards and the differing capabilities of manufacturers, would it be more effective to consider extension of periodic retest periods on a case-by-case basis through issuance of approvals, as provided by Sections 178.601(e), 178.801(e), and 178.955(e)?

11. Would packaging manufacturers be willing to submit packagings to UN Third-Party Packaging Certification Agencies for testing, in lieu of self-certification, in order to have a longer interval between periodic qualifications? Why or why not?

12. Do the users of non-bulk packagings, IBCs, or Large Packagings support an extension of the periodic qualification interval? Why or why not?

13. How would the extension of the periodic qualification interval impact costs or savings for users of non-bulk packagings, IBCs, or Large Packagings? Please quantify the impact on burden hours for employees using Bureau of Labor Statistics labor categories, if possible.

Aerosol Classification Alignment

PHMSA states that 49 C.F.R. Section 171.8 of the HMR defines an “aerosol” as:

[A]n article consisting of any non-refillable receptacle containing a gas compressed, liquefied or dissolved under pressure, the sole purpose of which is to expel a nonpoisonous (other than a Division 6.1 Packing Group III material) liquid, paste, or powder and fitted with a self-closing release device allowing the contents to be ejected by the gas.

PHMSA states that aerosols are limited to 1 L in capacity and are eligible to be shipped as a limited quantity in accordance with 49 C.F.R. Section 173.306(a)(3), (a)(5), and (b). PHMSA notes that these limited quantity exceptions allow for alternative packaging, specifically: non-specification non-refillable containers; U.S. Department of Transportation (DOT)-specification DOT 2P, DOT 2P1, DOT 2Q, DOT 2Q1, or DOT 2Q2 non-refillable metal receptacles; or DOT-specification DOT 2S non-refillable plastic receptacles. Eligibility for the different containers (non-specification, DOT 2P, 2Q, or 2S) is dependent on the pressure and flammability of the contents (*i.e.*, Division 2.1 aerosols are not permitted in DOT 2S plastic receptacles, and 2Q containers can contain material at higher pressures than 2P containers). According to PHMSA, the limited quantity exception also provides hazard communication exceptions that facilitate commerce while maintaining a level of safety corresponding to the level of hazard present for the aerosols.

In the 49 C.F.R. Section 172.101 Hazardous Materials Table (HMT), there are five entries for UN1950 aerosols:

- Aerosols, corrosive, *Packing Group II or III*, 2.2 (8);
- Aerosols, flammable, 2.1;
- Aerosols, flammable, n.o.s. (*engine starting fluid*), 2.1;
- Aerosols, non-flammable, 2.2; and
- Aerosols, poison, *Packing Group III*, 2.2 (6.1).

PHMSA states that these entries do not address other possible combinations of propellants and the liquid, paste, or powder contained in the aerosol (*i.e.*, a Division 2.1 flammable aerosol with a subsidiary hazard of Class 8). The International Civil Aviation Organization Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO TI) edition currently incorporated by reference in the HMR (the 2021-2022 edition) lists 11 types of UN1950 aerosols authorized for transportation by aircraft:

- Aerosols, *flammable*, 2.1;
- Aerosols, *flammable, containing substances in Division 6.1 Packing Group (PG) III and substances in Class 8, PG III*, 2.1 (6.1, 8);
- Aerosols, *flammable, corrosive, containing substances in Class 8, PG III*, 2.1 (8);
- Aerosols, *flammable (engine starting fluid)*, 2.1;
- Aerosols, *flammable, toxic, containing substances in Division 6.1 PG III*, 2.1 (6.1);

- Aerosols, *non-flammable*, 2.2;
- Aerosols, *non-flammable, containing substances in Division 6.1 PG III and substances in Class 8, PG III*, 2.2 (6.1, 8);
- Aerosols, *non-flammable, containing substances in Class 8, PG III*, 2.2 (8);
- Aerosols, *non-flammable (tear gas devices)*, 2.2 (6.1);
- Aerosols, *non-flammable, toxic, containing substances in Division 6.1, PG III*, 2.2 (6.1); and
- Aerosols, *oxidizing* 2.2 (5.1).

According to PHMSA, the International Maritime Dangerous Goods (IMDG) Code Dangerous Goods List (DGL) lists only one entry for UN1950 aerosols, which is associated with Special Provision (SP) 63. PHMSA states that SP 63 directs shippers to classify the primary hazard as Division 2.1 flammable gas or Division 2.2 non-flammable gas, based on the flammability of the contents of the container, and then to assign a Class 8 or Division 6.1 subsidiary hazard as necessary based on the nature of the contents to be expelled. The IMDG Code also authorizes Division 6.1, PG II and Class 8, PG II subsidiary hazard materials in aerosols, which the ICAO TI do not. The HMR currently allow Class 8, PG II subsidiary hazard materials in aerosols, but not Division 6.1, PG II. PHMSA notes that in practice, despite having only a single UN1950 entry for aerosols in the DGL, the IMDG Code acknowledges an even broader list of possible classifications for aerosols than the ICAO TI. The lack of alignment between the HMR and international regulations for aerosol classification creates confusion for shippers and carriers engaged in international shipments.

Matson Navigation submitted petition P-1698, requesting that PHMSA authorize Class 6.1 PG II material in aerosols for highway, rail, and vessel transport, and that PHMSA amend the HMR to include additional UN1950 aerosol entries in the HMT to account for Division 2.1 aerosols with subsidiary Division 6.1. The petition also requests that PHMSA align with the IMDG Code's 120-milliliter (mL) size restriction for aerosols with a 6.1 subsidiary hazard. PHMSA requests comment on the following questions to evaluate Matson Navigation's petition to allow subsidiary 6.1, PG II materials in aerosols for highway, vessel, and rail transportation, and create new entries in the HMT:

1. How many shipments of Division 2.2 (6.1), PG II and Division 2.1 (6.1), PG II aerosols would move within the United States per year if authorized? Please provide estimates for marine vessel, highway, and rail separately, if possible.
2. Are there any known international incidents involving Division 6.1, PG II aerosols, including those shipments that have entered the United States?
3. What would be the cost savings, per shipment, associated with allowing Division 2.2 (6.1) PG II and Division 2.1 (6.1) PG II material to be transported as an aerosol?
4. Do you support adoption of the IMDG Code 120-mL limit for Division 2.2 and Division 2.1 (6.1) PG II aerosols transported by highway, rail, and marine vessel? Marine vessel only? Why or why not?

5. How would the creation of additional entries on the Section 172.101 HMT for Division 2.1 aerosols with subsidiary hazards decrease confusion and facilitate international commerce?

6. Should aerosols in Division 2.2 and Division 2.1 with a subsidiary hazard of 6.1 PG II be required to bear markings indicating the package is forbidden for transportation aboard aircraft?

7. How often are shipments frustrated by the current disharmony between the HMR and international regulations? How many shipments are frustrated on an annual basis?

Requirements for Damaged, Defective, or Recalled Lithium Cells and Batteries

The HMR permit the shipment of damaged, defective, or recalled (DDR) lithium cells and batteries in accordance with 49 C.F.R. Section 173.185(f). PHMSA notes that these packaging instructions are more stringent than the normal lithium cell and battery instructions found in Section 173.185(b), and they do not permit the transportation of DDR lithium batteries and cells aboard aircraft. PHMSA received a comment from the Rechargeable Battery Association (PRBA) regarding two distinct issues related to the requirements for transportation of DDR cells and batteries: the limit of one DDR cell or battery per outer packaging and removing the word “recalled” from Section 173.185(f).

According to PRBA, the use of the word “recalled” in Section 173.185(f) “creates confusion for shippers and causes shippers to offer batteries and devices containing batteries that have been recalled for non-safety related reasons under the damaged, defective, or recalled provisions” in Section 173.185(f). PHMSA notes that it never intended to subject lithium batteries and lithium battery powered devices to the conditions in Section 173.185(f) if they had been recalled for a non-safety related purpose. When PHMSA created Section 173.185(f) in final rule HM-224F (79 Fed. Reg. 46011), it stated:

The HMR do not currently contain provisions for transporting batteries subject to a manufacturer’s recall or that are damaged and potentially dangerous. Based on previously developed guidance material and competent authority approvals, PHMSA will require lithium batteries that have been damaged, identified as being defective, or are otherwise being returned to the manufacturer for safety reasons, to be packaged in combination packages, surrounded by non-conductive cushioning material, and transported by highway or rail only.

PHMSA states that while its intent may have been clear in the HM-224F preamble, it acknowledges that the wording of Section 173.185(f) “could mislead a cautious shipper to ship lithium batteries and battery powered devices that had been recalled for any reason under the more restrictive requirements of this paragraph.” Therefore, PHMSA requests comment on the following questions to evaluate PRBA’s comment:

Clarification of “Defective”

1. PHMSA’s concerns with DDR batteries include that damaged or defective batteries have a higher chance of thermal runaway and creating fire and explosion in transportation. PHMSA does not consider devices and batteries recalled for non-safety related purposes to be subject to the “damaged, defective, or recalled” packing instruction in Section 173.185(f). How should PHMSA define “damaged, defective, or recalled” for lithium batteries to communicate clearly this distinction?

2. Given PHMSA's intended meaning of “damaged, defective, or recalled,” how frequently do shippers prepare lithium battery shipments under the restrictive requirements of Section 173.185(f) when the shipment does not actually involve DDR batteries, but batteries that are recalled for reasons other than safety? How many shipments are involved on an annual basis?

3. How much costlier are shipments of DDR batteries than non-DDR battery shipments? What contributes to higher costs for DDR battery shipments relative to non-DDR battery shipments?

Packaging Requirements for DDR Batteries

4. What techniques, besides a visual examination of the battery, are in use to identify DDR batteries prior to shipment?

5. Do the current requirements for DDR batteries in Section 173.185(f) provide an adequate level of safety during transportation for these higher risk batteries? If not, please describe the safety deficiencies you are aware of and suggest a means to address the deficiency.

6. Describe any technologies, practices, or procedures known to you that could reduce the risks presented by these batteries in transportation.

Section 173.150 Ethyl Alcohol Exception

49 C.F.R. Section 173.150(g) provides exceptions from the packaging and shipment requirements of the HMR for limited quantities of beverages, food, cosmetics and medicines, medical screening solutions, and concentrates containing ethyl alcohol (commonly referred to as ethanol or alcohol). PHMSA notes that currently, the applicability of the exception in Section 173.150(g) is limited to these items when they are “sold as retail products.” PHMSA received a comment to the 2017 Regulatory Reform Notice from the Association of Hazmat Shippers (AHS) requesting that the applicability of the exception be modified to include materials “suitable for retail sale.” According to PHMSA, Section 173.150(g) was added to the HMR based on special permit DOT SP–9275 in special permit conversion rulemaking HM–233C (79 Fed. Reg. 15033). PHMSA states that DOT SP-9275, as written at the time of adoption, did not use the phrases “consumer commodity,” “sold as retail products,” or “suitable for retail sale,” however. When PHMSA adopted DOT SP-9275, the phrase “sold as retail products” was added to limit the use of the exception to packages that PHMSA “was confident would pose minimal risk in transportation.”

According to PHMSA, AHS believes that limiting applicability of Section 173.150(g) to items “sold as retail products” unnecessarily limits the use of the exception and creates undue burden on shippers of other consumer type products that contain ethyl alcohol. To evaluate this request, PHMSA requests comment on the following questions:

1. How many shipments are offered under the Section 173.150(g) exception today on an annual basis?

2. How many more shipments would be offered annually under the provisions of Section 173.150(g) if the applicability language was changed to state “suitable for retail sale” rather than “sold as retail products”?

3. Describe scenarios in which a material is not “sold” as a retail product but is considered “suitable for retail sale.” In other words, how does the change in wording from “sold” to “suitable” make an impact on the eligibility for the exception?

4. Regardless of any change to the applicability of the Section 173.150(g) exception, have more shipments of consumer products containing ethyl alcohol been offered based on Section 173.150(g) after the Other Regulated Material-D (ORM-D) reclassification phase out on December 31, 2020?

5. Would shippers of different modes be differentially affected by this exception? Are there different costs or benefits for shipments by rail, air, highway, or vessel?

6. Have increased shipments of ethyl alcohol-based hand sanitizers during the COVID–19 public health emergency changed the risk profile and usage of this exception? If so, how?

Commentary

The PHMSA ANPRM is detailed and seeks a substantial amount of feedback from interested stakeholders. The items above are only a select few of the various items contained within this notice, but as detailed, these changes would be expected to have significant impact on parties shipping hazardous materials and to provide clarification on common issues noted. PHMSA stated previously its intent to amend the HMR to reduce the use of commonly used special permits. The data being collected here, and the content noted, initiate a formal process that is meant ultimately to ease regulatory burdens for both the agency and shippers. Interested stakeholders should review and provide details either on their own or through industry trade groups to allow PHMSA the proper tools and details it needs to reflect adequately potential changes to regulatory text.

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