



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

MAY 02 2019

Mr. Michael R. Kloesel
Manager
American Bureau of Shipping (ABS)
Corp. Container Certification Dept.
16855 Northchase Drive
Houston, TX 77060

Reference No. 18-0090

Dear Mr. Kloesel:

This responds to your June 11, 2018, email requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to United Nations (UN) portable tanks. Specifically, you describe several scenarios and observations related to the design, approval, construction, and use of UN portable tanks. Your questions are paraphrased and answered as follows:

- Q1. Are UN portable tank manufacturers required to indicate the hazardous material or group of hazardous materials intended to be transported to a design approval agency?
- A1. The answer is yes. As prescribed in § 178.273(b)(7)(ii), the UN portable tank design approval agency must issue a certificate to the manufacturer that refers to the prototype test report, the hazardous material or group of hazardous materials allowed to be transported, the materials of construction of the shell and lining (when applicable) and an approval number.
- Q2. Absence of information regarding the specific commodity to be transported in a UN portable tank prevents verification of compatibility with the tank. Is this a correct statement?
- A2. The answer is yes. As prescribed in § 178.274(b)(2)(i), portable tank shells, fittings, and pipework shall be constructed from materials that are compatible with the hazardous materials intended to be transported. Further, § 178.273(b)(7)(ii) requires that the approval certificate issued by the approval agency certify that the UN portable tank design is suitable for its intended purpose and meets the requirements of the HMR. More specifically, the approval certificate must refer to the hazardous material or group of hazardous materials authorized to be transported in the UN portable tank. Thus, the specific commodity intended to be transported in the portable tank must be known beforehand to verify compatibility with the tank.

Q3. A portable tank approval stipulates that an approval to a higher T-Code satisfies the design requirements of a lower T-Code. Is this a correct statement?

A3. The answer is yes, provided certain requirements are met. As prescribed in § 172.102(c)(7)(v), an alternate portable tank instruction may be used if:

- The alternative portable tank has a higher or equivalent test pressure (for example, 4 bar when 2.65 bar is specified);
- The alternative portable tank has greater or equivalent wall thickness (for example, 10 mm when 6 mm is specified);
- The alternative portable tank has a pressure relief device as specified in the “T” Code. If a frangible disc is required in series with the reclosing pressure relief device for the specified portable tank, the alternative portable tank must be fitted with a frangible disc in series with the reclosing pressure relief device; and
- With regard to bottom openings—
 - When two effective means are specified, the alternative portable tank is fitted with bottom openings having two or three effective means of closure or no bottom openings; or
 - When three effective means are specified, the portable tank has no bottom openings or three effective means of closure; or
 - When no bottom openings are authorized, the alternative portable tank must not have bottom openings.

Q4. All UN portable tanks, and not just those required to be U-stamped, must be designed and constructed in accordance with Section VIII, Division 1 of the American Society of Mechanical Engineers (ASME) Code. Is this a correct statement?

A4. The answer is yes. As prescribed in § 178.274(b)(1), shells must be designed and constructed in accordance with Section VIII of the ASME Code. However, as prescribed in § 178.274(a)(2), the technical requirements applicable to UN portable tanks may be varied if approved by the Associate Administrator and the portable tank is shown to provide a level of safety equal to or exceeding the requirements of the HMR. Portable tanks approved to alternative technical requirements must be marked “Alternative Arrangement” as specified in § 178.274(i).

Q5. Are materials of construction prescribed in the ASME Code only required on a U-stamped UN portable tank?

- A5. The answer is no. As prescribed in § 178.274(b)(1), the materials of construction prescribed in the ASME Code are required on all UN portable tanks designed and constructed in accordance with the ASME Code, except as limited or modified in the HMR.
- Q6. We have observed offshore portable tanks from Europe designed under an alternative arrangement that do not meet the remote operation of valve requirements in 6.7.2.6.3.1.4 of the International Maritime Dangerous Goods (IMDG) Code. Is this practice acceptable in the United States?
- A6. The answer is yes, provided such portable tanks meet certain requirements. Under § 173.24(d)(2) of the HMR, a UN standard packaging manufactured outside of the United States in conformance with national or international regulations based on the UN Recommendations on the Transportation of Dangerous Goods (UN Recommendations) is an authorized packaging, as this term is defined under § 173.24(c)(1), when: (1) the packaging fully conforms to applicable provisions in the UN Recommendations and the requirements of subpart B part 173 of the HMR, including reuse provisions; (2) the packaging is capable of passing the prescribed tests in part 178 of the HMR applicable to that standard; and (3) the competent authority of the country of manufacture provides reciprocal treatment for UN standard packagings manufactured in the United States. This authorization is applicable to a UN portable tank approved under an alternative arrangement issued by the competent authority of the country of manufacture if other than the United States.

In addition, when transported to, from, or within the United States, § 171.25(c) requires UN portable tanks used to transport gases to comply with the HMR. UN, and other types of portable tanks transported to, from, or within the United States must also comply with the following requirements prescribed in § 171.25(c)(1) - (c)(4):

- UN portable tanks must conform to the requirements in Special Provisions TP37, TP38, TP44, and TP45 when applicable, and any applicable bulk special provisions assigned to the hazardous material in the § 172.101 Hazardous Materials Table;
- International Maritime Organization (IMO) Type 5 portable tanks must conform to Department of Transportation (DOT) Specification 51 or UN portable tank requirements, unless specifically authorized in the HMR or approved by the Associate Administrator;
- Except as specified in subpart C of part 171 of the HMR, for a material poisonous (toxic) by inhalation, the T Codes specified in Column 13 of the Dangerous Goods List in the IMDG Code may be applied to the transportation of those materials in intermodal (IM),

IMO and DOT Specification 51 portable tanks, when these portable tanks are authorized in accordance with the requirements of the HMR;

- No person may offer an IM or UN portable tank containing liquid hazardous materials of Class 3, Packing Group (PG) I or II, or PG III with a flash point less than 100 °F (38 °C); Division 5.1, PG I or II; or Division 6.1, PG I or II, for unloading while it remains on a transport vehicle with the motive power unit attached unless it conforms to the requirements of § 177.834(o) of the HMR.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,

A handwritten signature in cursive script, appearing to read "T. Glenn Foster".

T. Glenn Foster
Chief, Regulatory Review and Reinvention Branch
Standards and Rulemaking Division



June 6, 2018

U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration
East Building, PHH – 33
1200 New Jersey Avenue, Southeast
Washington, D.C. 20590

Subject: Application of Dangerous Goods Regulations

Dear Sir or Madam,

ABS is in the process of expanding our worldwide presence in the certification of containers carrying dangerous goods. We have recently encountered a situation which has resulted in the loss of business due to either our misinterpretation or others improper implementation of the regulations.

We request a clear interpretation of the four items outlined below which we have been requested to accept and certify under our US DOT approval but believe the requests do not meet the intention of the regulations.

1. T-code approval

- Manufacturers who submit for approval of the design are requesting designs to be approved by indicating the T-code only and not specifying the individual or group of commodities with associated UN Numbers at the time of certification.
- ABS does not believe a design can be properly approved based on the T-code only because of the following:
 - a. Absence of information regarding the commodity would not allow verification of the compatibility between the commodity and the safety equipment/tank/gasket/lining. Compatibility is to be verified under 49 CFR 178.274 (b6) and IMDG section 6.7.2.2.7.
 - b. The approval process stipulates that an approval to a higher T-code satisfies the design requirements of a lower T-code. However, the Portable Tank Instructions found Section 4.2.5.2.6 of the IMDG Code require different minimum shell thicknesses, pressure relief provisions and bottom opening provisions.

For example: If the container is approved as a T11 container and has a bottom opening, in theory, the container is also approved for T1 to T10. However, T-codes T5 and T8 thru T10 do not allow bottom openings.

- c. According 49 CFR 178.274 (b1) portable tanks must be U stamped when used for Hazard Zone A or B toxic by inhalation liquids, or when used for non-refrigerated or refrigerated liquefied compressed gases. Therefore if we do not have the commodities specification we will not be able

to identify if the container is required to be U stamped or not. Even considering approval just for T codes T1 to T22 (excluding gases), we still not be able to identify if these T –codes fall under the category of Hazard Zone A or B toxic by inhalation liquids.

2. Stiffener Requirements

- Manufacturers who submit for approval of the design are requesting the ASME requirements to be waived when the pressure vessel is not required to be ASME U-stamped by an ASME qualified Inspector under 49 CFR 178.274 (b1). In lieu of meeting the required ASME calculations and arrangements, a vacuum test is being performed to verify the adequacy of the design.

For example:

- a. **UG-28 Shell Thickness Requirement:** The length used in the shell thickness calculation in UG-28 is based on either the total length of the vessel or the distance between the ring stiffeners. The ring stiffeners must pass the strength requirements of UG-29 in order to be considered effective to reduce.
- b. **UG-29 Stiffening Rings for Cylindrical Shells Under External Pressure:**
 - i. **UG-29(a) Stiffener Strength Requirement:** Stiffeners which do not meet the requirements of UG 29(a) are being accepted by other certification companies. By waiving the strength requirement for the stiffeners in UG-29(a), the spacing used to evaluate the plating can be significantly reduced allowing for thinner shell material.
 - ii. **UG-29(b) Stiffener Continuity:** Stiffeners which do not meet the requirements of UG-29(b) are being accepted by other certification companies. Others are waiving the requirement that the stiffeners are to extend completely around the circumference of a vessel. The ASME Code does however allow alternative arrangements as outlined in the code under UG-29(c) but from our experience, the vessels do not meet the criteria to accept an alternative.

Although in some cases other than the above example, special shapes may considered in UG-19(b) which refers to U-2(g). Section U-2(g) indicates alternatives are subject to the acceptance of the inspector but for vessels which do not require a U-stamp, there is not an ASME qualified inspection involved to make the decision.

Designs are being accepted by other certification companies on the basis that because the vessel is not required to be U-stamped by an ASME qualified Inspector, the length used to evaluate the plate in UG-28 is always taken as the distance between the ring stiffeners regardless of whether the ring stiffeners meet the UG-29 requirements.

- ABS believes the pressure vessel must always be design and constructed in accordance with the requirements of ASME VIII Div. 1 as indicated in 49 CFR 178.274 (b)(1). We also believe that our interpretation applies to a vessel which may not be required to be U-stamped.

In addition, ABS believes that the calculation provides a factor of safety of 3:1 when a vacuum test performed at test pressure is a factor of safety of 1.0.

3. Material Requirements

- Manufacturers who submit for approval of the design are requesting designs to be approved using materials which may not meet the requirements of the ASME Code. ASME materials are only used when the vessel is required to be U-stamp and for example, SANS 50028-7 is being used without an evaluation of equivalency.
- ABS believes that a vessel is to be constructed using ASME material in accordance with UG-4(a).

4. Remote Operation of Valves

- ABS has been informed of an issue in Europe regarding the remote operation of valves under paragraph 6.7.2.6.3.1.4. There have been many Offshore Portable Tanks certified without meeting the criteria in IMDG 6.7.2.6.3.1.4 and are now continuing to be manufactured under an alternative arrangement (AA) notation.

Please feel free to contact me at the below numbers or Ms. Simone Goncalves at (281) 877-6325 with any questions or comments.

Best regards,



Michael R. Kloesel
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Stevens
Consumer Commodity
18-0090

January, Ikeya CTR (PHMSA)

From: Kelley, Shane (PHMSA)
Sent: Monday, June 18, 2018 12:38 PM
To: January, Ikeya CTR (PHMSA)
Cc: DerKinderen, Dirk (PHMSA); Foster, Glenn (PHMSA); Benninghoven, Neil (PHMSA)
Subject: FW: Interpretations Requested
Attachments: Carriage of Dangerous Goods - Industry Issues.pdf

Good afternoon Ikeya

On the basis of Dirk's review and indication that this is appropriately handled as an interp, please assign for action. Neil is the contact in PHH-30 that person should work with closely as well as any others needed in PHH.

Thanks!

Shane

From: Benninghoven, Neil (PHMSA)
Sent: Tuesday, June 12, 2018 10:05:23 AM
To: Kelley, Shane (PHMSA); Foster, Glenn (PHMSA)
Subject: FW: Interpretations Requested

Does this go to you guys?

Neil Benninghoven
Approvals and Permits Division – PHH-30
Pressure Vessels Branch
PHMSA, U.S. DOT
Office: (202) 366-2665
Cell: (202) 573-4342
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Website: <https://www.phmsa.dot.gov/>

East Building, E23-438
1200 New Jersey Ave., SE
Washington, D.C. 20590-0001

From: Michael Kloesel [mailto:mkloesel@eagle.org]
Sent: Monday, June 11, 2018 3:56 PM
To: Approvals (PHMSA) <Approvals@dot.gov>
Cc: Benninghoven, Neil (PHMSA) <james.benninghoven@dot.gov>
Subject: Interpretations Requested

Dear Sir or Madam,

Please find a letter attached identifying items which ABS feels are not meeting the dangerous goods regulations.

We have a great need for interpretations of each item identified on the letter to be provided.

Your immediate attention would be greatly appreciated as we are losing business to competitors which continue to certify containers as outlined on the attached and as a DAA.

Best regards,

Michael R. Kloesel
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