



DEPARTMENT OF TRANSPORTATION
HAZARDOUS MATERIALS REGULATIONS BOARD
WASHINGTON, D.C. 20590

Chapter I—Department of
Transportation

[Docket No. HM-5; Amdts. 173-2, 177-2]

PART 173—SHIPPERS

PART 177—SHIPMENTS MADE BY
WAY OF COMMON, CONTRACT,
OR PRIVATE CARRIERS BY PUBLIC
HIGHWAY

Hazardous Materials Regulations
Board; Stress Corrosion in MC 330
and MC 331 Cargo Tanks

On January 31, 1968, the Federal Highway Administrator published Docket HM-5; Amendments 173-1, 177-1 (33 F.R. 2389), containing amendments to the Hazardous Materials Regulations to require the prompt inspection of MC 330 and MC 331 cargo tanks made of quenched and tempered steels to determine the need for repair and to insure the product retention integrity of vessels involved. This action was predicated on the relatively recent occurrences of stress corrosion cracking being experienced and reported to the Department by transporters of anhydrous ammonia. The amendment was addressed to known stress corrosion conditions and contained requirements for inspections and repairs based in the main on the recommendations of affected shippers and tank motor carriers. The amendments were also made applicable to shipments of liquefied petroleum gas because there was good reason to suspect that the sulfides which may be found in "sour" liquefied petroleum gas are potential contributors to stress corrosion cracking.

After extensive consultations with persons knowledgeable in the manufacture of quenched and tempered steels and in the design and fabrication of cargo tanks, it was determined that stress corrosion cracking could be precluded by purging air from cargo tanks before loading with anhydrous ammonia and by requiring anhydrous ammonia to be inhibited with 0.3 percent water by weight or be 99.995 percent pure. Requirements for these aspects were included in the initial order.

The Compressed Gas Association (CGA) has now requested the FHWA to give further consideration to those aspects of Docket HM-5 with respect to: (1) The validity of postweld heat treatment of welded repair areas, and (2) internal areas to be inspected.

CGA states that the reason for requiring welded repair areas to be postweld heat treated was that the steel companies recommended that quenched and tempered steel cargo tanks be postweld heat treated as a precaution against stress corrosion cracking resulting from

transportation of anhydrous ammonia or other contaminated lading.

CGA now states that postweld heat treatment is not necessary since the lading conditions that contribute to stress corrosion cracking are being controlled. Also, they state that certain producers of quenched and tempered steels indicate that pressure vessels fabricated of these steels are better in the as-welded condition than if they are postweld heat treated. Two major producers of the steel in question have confirmed this. Also, these producers have advised that while postweld heat treatment may in some cases reduce the likelihood of stress corrosion cracking, postweld heat treatment will not guarantee that stress corrosion cracking will not occur.

On the basis of this new information and other supporting evidence recently submitted pertaining to the effect of postweld heat treatment on quenched and tempered steels of the type and thicknesses used to construct MC 330 and MC 331 cargo tanks, § 177.824(f) (5) is amended to eliminate the requirement for postweld heat treatment after welded repairs are made.

CGA has requested modification of the requirement for internal inspection opposite external welds so that inspection of areas opposite nonloadbearing supports such as lighting brackets, ladders, etc., is not required. This request is based on the premise that stress corrosion cracks opposite these small external welds have been found only in cases where cracks have also been found in the more critical external weld areas of the tank. Although the Administrator does not have any information to indicate that this premise is incorrect, the Administrator does not believe that this information alone justifies modification of the internal inspection requirement to the extent requested.

However, the Administrator has determined that inspection of internal areas opposite exterior welds that are visibly discernible on the interior of the tank will provide the level of testing desired and necessary. Accordingly, an appropriate modification of § 177.824(f) (2) is provided.

In § 173.315(a) (1) table, Note 14, the words "for metallurgical grade" have been deleted to avoid any possible confusion that could result from use of the concerned grade of ammonia for other than metallurgical purposes.

After completion of the test required therein, the concluding clause of § 177.824(f) (3) (ii) prohibited the use of quenched and tempered steel MC 330 and MC 331 cargo tanks in the carriage of liquefied petroleum gases except those that meet the requirements of National Gas Processors Association specification 2140 (1962 edition). As drafted, this limitation did

not apply to quenched and tempered steel tanks that were subject to § 177.824(f) (3) (i), although the safety justification for this requirement applies equally to those tanks previously used for both anhydrous ammonia and liquefied petroleum gases. To remove this inconsistency, and also to place this continuing prohibition in a more appropriate portion of the regulations a new Note 15 is being added to the table in paragraph (a) (1) of § 173.315. This note makes it clear that after December 1, 1968, or after completion of the test required by § 177.824(f) (3) (i) and (ii), whichever occurs first, quenched and tempered steel MC 330 and MC 331 cargo tanks may only carry liquefied petroleum gas if it meets NGPA 2140 (1962 edition).

In addition, consistent with Note 15 of the table in § 173.315(a) (1), §§ 173.427, and 177.817 are amended by requiring shipping papers to show the notation "NGPA 2140" indicating suitability of the liquefied petroleum gas to be transported in MC 330 or MC 331 cargo tanks constructed of quenched and tempered steels. In § 177.824, paragraph (h) has been amended to require cargo tanks tested in conformance with the requirements of § 177.824(f) to be marked with the letters "WF" to indicate the wet fluorescent magnetic particle tests have been completed. The period between publication of this amendment and the effective date is considered to be sufficiently long to allow for the marking of cargo tanks that have already completed this test.

To the extent that these amendments are other than clarifying they are for the most part relaxatory in nature and consistent with the changes requested by, and discussed with, representatives of the affected interested groups. Therefore, in order to best serve the purposes set forth above, I find that notice and public procedure is impractical and unnecessary.

To allow a reasonable time for compliance with the changes made herein, these amendments are not being made effective upon issuance. However, compliance with these amendments is authorized on and after the date of publication in the FEDERAL REGISTER.

In consideration of the foregoing, the Hazardous Materials Regulations of the Department of Transportation (49 CFR Parts 170-100) are amended effective July 1, 1968, as set forth below.

(Secs. 831-835, Title 18, United States Code, and section 9 of the Department of Transportation Act; 49 U.S.C. 1557)

Issued in Washington, D.C., on May 13, 1968.

LOWELL K. BRINWELL,
Administrator,
Federal Highway Administration.

I. Part 173 is amended as follows:
(A) By amending § 173.315(a) (1) table and Note 14 thereto; by adding Note 15 to read as follows:

§ 173.315 Compressed gases in cargo tanks and portable tank containers.
(a) * * *
(1) * * *

Kind of gas	Maximum permitted filling density		Specification container required	
	Percent by weight (see Note 1)	Percent by volume (see par. (f) of this section)	Type (see Note 2)	Minimum design pressure (p.s.i.g.)
Change Liquefied petroleum gas (see Note 15) * * *	See par. (b) of this section. * * *	See par. (b) of this section. * * *	ICC-51, MC-330, MC-331 * * *	See par. (c) (1) of this section. * * *

NOTE 14: Specifications MC 330 and 331 cargo tanks constructed of other than quenched and tempered steel ("NQT") are authorized for all grades of anhydrous ammonia. Specifications MC 330 and MC 331 cargo tanks constructed of quenched and tempered steel ("QT") (see marking requirements of § 177.823(b) (5) of this chapter) are authorized for either anhydrous ammonia having a minimum water content of 0.2 percent by weight or anhydrous ammonia at least 99.995 percent pure. Any tanks going into anhydrous ammonia service which have been in other service or have been opened for inspection, test, or repair—including new tanks—shall be cleaned of the previous product and shall be purged of air before loading. See §§ 173.427(a) (3) and 177.817(a) (1) for special shipping paper requirements.

NOTE 15: Specifications MC 330 and MC 331 cargo tanks constructed of other than quenched and tempered steel ("NQT") are authorized for all grades of liquefied petroleum gas. After December 1, 1968, or after completion of the test required by § 177.824 (f) (3), whichever occurs first, specifications MC 330 and MC 331 cargo tanks constructed of quenched and tempered steel ("QT") (see marking requirements of § 177.823(b) (5) of this chapter) are authorized only for liquefied petroleum gas which meets the National Gas Processors Association Specification 2140 (1962 edition). See §§ 173.427(a) (4) and 177.817(a) (2) of this chapter for special shipping paper requirements.

(B) By adding subparagraph (a) (4) in § 173.427 to read as follows:

§ 173.427 Shipping papers.

(a) * * *
(4) For shipments of liquefied petroleum gas in specifications MC 330 and MC 331 cargo tanks constructed of quenched and tempered steel the shipper must also show "NGPA 2140" to indicate suitability for shipment in such tanks as authorized by § 173.315(a) (1) table, Note 15.

II. Part 177 is amended as follows:

(A) § 177.817 paragraph (a) is amended by adding subparagraph (2) thereto as follows:

§ 177.817 Shipping papers.

(a) * * *
(2) Carriers must not accept for transportation or transport liquefied petroleum gas in specifications MC 330 and MC 331 cargo tanks constructed of quenched and tempered steel unless the shipping paper is marked "NGPA 2140" to indicate suitability for shipment in such tanks as authorized by § 173.315(a) (1) table, Note 15 of this chapter.

(B) By amending § 177.824 subparagraphs (f) (2), (f) (3) (ii), (f) (5), and paragraph (h) to read as follows:

§ 177.824 Retesting and inspection of cargo tanks.

(f) * * *
(2) The inspection required by subparagraph (1) of this paragraph shall be conducted in accordance with the applicable parts of Appendix 6, section VIII of the ASME Code, 1965 edition. An alternating current yoke shall be used in the wet fluorescent magnetic particle method. Internal inspection shall include: All internal welds; all areas extending at least 2 inches from such welds in all directions; all internal surfaces at least 2 inches in all directions from all exterior welds which are visibly discernible on the interior of the tank; entire internal surface of tank heads. If any cracks are found, the entire interior surface of the tank shall be inspected.

(3) * * *
(ii) Any cargo tank which has never been in anhydrous ammonia service, and which has been used to transport liquefied petroleum gas shall not be used to

transport any flammable compressed gas after December 1, 1968, unless it has been tested in accordance with subparagraph (1) of this paragraph.

(5) All cracks and other defects found shall be repaired in accordance with the repair procedures described in section VIII of the edition of the ASME Code under which the tank was built. Each tank requiring welded repairs shall meet all of the requirements of § 178.337-16 of this chapter except that postweld heat treatment after welded repairs is not required.

(h) Test date markings. The date of the last test shall be durably marked on the tank in letters not less than 1/4 inches high in legible colors near the metal certification plate. The date shall be followed by the letter "V" for visual (or magnetic particle, X-ray, etc.) test, or "H" for hydrostatic (or pneumatic) tests. Specifications MC 330 and MC 331 cargo tanks tested in conformance with the requirements of paragraph (f) of this section shall also be marked with the letters "WF" to indicate that wet fluorescent magnetic article test has been completed. The letters "WF" shall be at least 1/4 inches high, in legible colors and near the metal certification plate.

[F.R. Doc. 68-5979; Filed, May 20, 1968; 8:48 a.m.]