DEPARTMENT OF TRANSPORTATION

Research and Special Programs Administration

49 CFR Parts 173, 178, and 180

[Docket No. 183C; Notice No. 93-7]

RIN 2137-AC37

Cargo Tanks; Miscellaneous Requirements

AGENCY: Research and Special Programs Administration (RSPA), DOT.

ACTION: Notice of proposed rulemaking (NPRM) and announcement of public meeting.

SUMMARY: RSPA proposes to amend certain requirements on the manufacture, qualification and maintenance of cargo tank motor vehicles. The proposed changes are based on petitions for rulemaking, exemptions, and National Transportation Safety Board recommendations. In addition, in response to certain petitions, this notice announces a public meeting to discuss certain technical areas on specification cargo tank motor vehicles. The intended effect of these actions is to relax certain regulatory requirements and to reduce unnecessary economic burdens on industry where there will be no adverse effect on safety.

DATES: *Written comments:* Comments must be received on or before June 15, 1993.

Public meeting: A public meeting will be held on March 24 and 25, 1993. It will begin at 2 p.m. on March 24, 1993.

ADDRESSES: *Written comments* should be submitted to the Dockets Unit (DHM-30), Research and Special Programs Administration, U.S. Department of Transportation, Washington, DC 20590-0001. Comments should identify the docket and notice number and be submitted in five copies. Persons wishing to receive confirmation of receipt of their comments should include a self-addressed stamped post card. The Dockets Unit is located in room 8421 of the Nassif Building, 400 Seventh Street, SW., Washington, DC. Public dockets may be reviewed between the hours of 8:30 a.m. and 5 p.m., Monday through Friday.

The *public meeting* will be held in the Federal Aviation Administration Building, 2300 East Devon Avenue, room 166-170, Des Plaines, Illinois, 60018.

FOR FURTHER INFORMATION CONTACT: Ronald Kirkpatrick, telephone (202) 366-4545, Office of Hazardous Materials Technology, or Jennifer Karim, (202) 366-4488, Office of Hazardous Materials Standards, Research and Special Programs Administration, U.S. Department of Transportation, Washington, DC 20590-0001.

SUPPLEMENTARY INFORMATION:

A. Background:

Most of the issues raised in this NPRM relate to requirements that were adopted in final rules published under Dockets Nos. HM-183/HM-183A (June 12, 1989, 54 FR 24982; May 22, 1990, 55 FR 21035; September 7, 1990, 55 FR 37028; June 17, 1991, 56 FR 27872). The final rules established three new cargo tank specifications designated as DOT 406, DOT 407 and DOT 412. Manufacture of cargo tanks to these new specifications was authorized beginning on December 31, 1990.

RSPA received several petitions for rulemaking requesting amendment to certain requirements relating to the new DOT 400 series cargo tank motor vehicles in part 178, and to the operation and maintenance requirements in parts 173 and 180. All petitions have been given full consideration. RSPA proposes to grant certain petitions that would reduce unnecessary and burdensome regulations and result in positive benefits to industry. Additionally, these proposals would reduce costs for industry without reducing the level of public safety.

B. Summary of Petitions.

The Cargo Tank Manufacturing Association (CTMA) petitioned (P-1125) DOT to suspend, review and rewrite the Hazardous Materials Regulations (HMR) on cargo tank motor vehicles. Certain issues raised by CTMA and several other petitioners also were raised in rulemaking proceedings and were fully addressed during the rulemakings published under HM-183/183A and in public meetings. The petitioners requested that RSPA reverse its position on earlier requests that had been denied. Some petitioners also made certain other requests that were not practical, were not within RSPA's purview under the Hazardous Materials Transportation Act (HMTA), or if granted, would adversely affect safety. Some of the requests made by the petitioners are as follows:

CTMA recommendation that DOT organize a joint government/industry task force to develop acceptable solutions to correct serious defects in HM-183. RSPA believes the scheduled public meeting will address issues that must be resolved to ensure the smooth implementation of the new regulations. A public meeting will provide a broader forum for open discussion, allow a more rapid resolution of problems identified by petitioners, and facilitate quicker implementation of regulatory changes than an advisory committee or joint task force. A record containing a summary of the key issues discussed at the meeting will be placed in the Public Docket.

CTMA request that DOT review and consider the over 1,000 petitions received by DOT regarding HM-183 requirements. During the development of the regulations published under Dockets HM-183/183A, DOT evaluated all outstanding petitions for rulemaking and considered all petitions for reconsideration. RSPA received nearly 1,100 petitions for reconsideration. Approximately 900 of these petitions were from the propane gas industry concerning a misunderstanding of a provision that applies to liquid hazardous materials and not to gases; RSPA addressed these petitions in the May 22, 1990 **Federal Register** publication (55 FR 21035). About another 100 petitions were from the petroleum industry concerning the retention of petroleum products in external piping and hoses. These petitions from the petroleum industry and the other remaining petitions within the scope of the rulemaking were addressed in the September 7, 1990 **Federal Register** publication (55 FR 37028). RSPA accepted certain requests that were outside the scope of the rulemaking as petitions for rulemaking. This NPRM addresses most of those requested changes.

CTMA request that DOT require all cargo tanks operating at 15 psi and above to be ASME certified and stamped. This issue was fully considered in the development of the regulations published under Dockets HM-183/183A. RSPA originally proposed that all new specification cargo tank motor vehicles must be constructed and certified in accordance with the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). In responding to the merits of comments from interested persons, RSPA revised the proposal in the final rule. Except for vacuum-loaded cargo tank motor vehicles, only those DOT 407 cargo tank motor vehicles with a maximum allowable working pressure (MAWP) greater than 35 psig and DOT 412 cargo tank motor vehicles with an MAWP greater than 15 psig are required to be constructed and certified in accordance with the ASME Code. RSPA provided for all DOT 406 cargo tanks, for all DOT 407 cargo tanks with an MAWP of 35 psig or less and for all DOT 412 cargo tanks with an MAWP of 15 psig or less

to be constructed, but not certified, to the ASME Code largely because of manufacturers' use of "stuffed head" configurations and noncylindrical designs. By accepting these variations, RSPA provided for the continued use, based on their proven safety record, of design configurations and construction practices used in producing MC 306 and MC 307 cargo tanks for many years. For additional discussion, refer to the heading "Application of the ASME Code to Low Pressure Cargo Tanks," in the June 12, 1989 Federal Register publication (54 FR 24983).

CTMA request that DOT determine actual forces, by test or modeling, that effect accident damage protection devices, roll-over, rear bumpers, etc., including the structural integrity of the tank and develop design procedures that are appropriate, as recommended by National Transportation Safety Board (NTSB) and industry. In response to a recommendation from the NTSB, Federal Highway Administration (FHWA) and RSPA are evaluating the area of rollover protection devices. Based upon the results of the analysis, RSPA will take appropriate action.

CTMA recommendation that DOT develop venting and relief requirements that conform with good engineering practices. CTMA provided no data that demonstrates the venting and pressure relief requirements for DOT 400 series specification cargo tank motor vehicles do not meet good engineering practices. These requirements were given full consideration in the rulemaking process. In addition, two companies advertised that they currently make pressure relief devices fully conforming to the prescribed requirements.

CTMA recommendation to eliminate the requirement for self-closing systems on hazardous waste tanks that handle liquid and semi-solid hazardous waste containing suspended solids. This issue was fully considered during the rulemaking proceeding. RSPA based the requirements contained in the HMR on petitions for reconsideration and comments received during several HM-183/183A public meetings. Before adoption of the final rule under HM-183/183A, the HMR required that product discharge openings on MC 306 and MC 307 cargo tanks and bottom outlet openings on MC 312 cargo tanks be equipped with internal self-closing valves (§§ 178.341-5(a), 178.342-5(a) and 178.343-5(a)). The valve seat had to be located inside the tank or within the welded flange, its companion flange, nozzle, or coupling. The valves also had to be protected by a shear section or suitable guards. The vast majority of vacuum-loaded cargo tank motor vehicles operated under DOT exemptions. Those exemptions required outlets to be equipped with self-closing valves. Under HM-183/183A final rules (June 12, 1989, 54 FR 24982; May 22, 1990, 55 FR 21035; September 7, 1990, 55 FR 37028; June 17, 1991, 56 FR 27872) the requirements for self-closing systems were applied consistently across the board. The self-closing valve is needed as a safety feature to ensure that the discharge valve closes in an emergency situation such as a fire, where the operator may not be able to reach the valve. Vacuum-loaded waste tanks were included because waste haulers often do not know the exact composition of the waste being transported and the final rule did not limit the use of these cargo tanks to hazardous wastes. RSPA repeatedly stated in working meetings, and in written clarifications of the new requirements, that the self-closing systems are needed only during emergencies (hose ruptures, fires, etc.) and that the system may be designed for manual operation under normal conditions but must be self-closing in an emergency.

CTMA recommendation that DOT implement an effective enforcement program as recommended by NTSB and industry. FHWA holds delegated authority for enforcement matters regarding cargo tank motor vehicles. FHWA expanded its cargo tank enforcement program as a result of the new cargo tank requirements. The Office of Motor Carrier Field Operations established a National Cargo Tank Manufacturer, Assembler, and Repair/Inspection Facility Program to enhance compliance. Although FHWA recently focused much attention on motor carriers operating cargo tanks, now it plans to increase compliance monitoring of cargo tank manufacturers.

C. Public Meeting

Items open for discussion at the public meeting include the following:

1. Application of the ASME Code to DOT 400 series specification cargo tank motor vehicles.

a. The feasibility of citing all sections of the ASME Code that must be met in construction of DOT specification cargo tank motor vehicles as opposed to citing only those sections that do not apply.

b. The development of a consensus standard containing procedures for quality control, welding and design as an alternative to the procedures contained in the ASME Code.

2. The progress of the industry on development and testing of dual function vents, reclosing pressure relief devices capable of reseating with the loss of less than one-gallon of lading, and self-closing systems for vacuum-loaded waste tanks.

3. The regulatory proposals contained in this notice.

D. Section-by-Section Review

The following is a section-by-section summary of the proposed changes:

Section 173.225

Paragraph (e)(2) would be revised to authorize the use of MC 307 and DOT 407 cargo tank motor vehicles for organic peroxides. This proposed change is based on the satisfactory experience of MC 307 cargo tanks operating under exemption (e.g., E 6610, E 8396, E 8710, E 8932) and a recent revision to the HMR, under a separate rulemaking action [57 FR 45446, October 1, 1992], authorizing use of the DOT 412 cargo tank, which is equal in integrity to the MC 307 cargo tank, for organic peroxides.

Section 173.315

The table in paragraph (a) would be revised to correct an error. For the entry "Nitrous oxide, refrigerated liquid" in Column 4, the ditto notation "do" would be removed and replaced with "DOT-51, MC-330, MC-331". This revision is necessary to eliminate reference to the preceding entry containing Note 23. Note 23 applies to cargo tanks used to transport poisonous by inhalation materials. Nitrous oxide does not meet this criteria.

Paragraph (o)(1) prescribes requirements for piping, hose, or other devices used for loading or unloading cargo tank motor vehicles in chlorine service. The Chlorine Institute petitioned (P-1062) RSPA to remove a restriction that no hose, piping, or tubing used for loading or unloading may be mounted or carried on the motor vehicle. The Chlorine Institute stated that a private carrier often is more experienced and qualified than the consignee to select, handle, test and maintain the high-pressure hoses for chlorine. RSPA agrees with the commenter's request and proposes to revise § 173.315(o)(1) to allow hose, piping, or other tubing to be carried on the vehicle. However, the hose, piping or tubing must be capped to prevent the entry of moisture.

Paragraph (o)(2) requires that each angle valve on a cargo tank used in chlorine service be leak tested once every five loadings or once a week, whichever occurs first. The Chlorine Institute petitioned (P-1062) RSPA to remove the requirement on the basis that it is unnecessary. The Chlorine Institute further stated that identical

angle valves are used on chlorine tank cars and there has never been a requirement to retest these valves. RSPA agrees that the experience record on the use of angle valves on tank cars is satisfactory. Accordingly, RSPA proposes to require that angle valves must be tested once every two years, to coincide with the periodic retest schedule for chlorine tanks specified in § 180.407(c). A separate requirement for testing of angle valves and gasketed joints before installation is retained.

Section 178.337–1

Paragraph (a)(3) contains references to § 173.33(i) and § 173.315(a) Table Note 11. The reference to § 173.33(i) would be corrected to read § 178.337–1(e)(2) and reference to Note 11 of the § 173.315(a) Table would be removed. Paragraph (e)(1) prescribes that each tank required to be insulated must conform with the use and performance requirements contained in § 173.315(a) Table, Note 11. This note 11 is intended for refrigerated gases. Among its requirements is the use of insulated cargo tanks with a design service temperature of minus 100 °F., or no warmer than the boiling point at one atmosphere of the hazardous material to be transported therein, whichever is colder. However, recent changes to the § 172.101 Hazardous Materials Table require that bulk packagings used to transport any compressed gas meeting the poisonous by inhalation criteria for Hazard Zones A, B and C must meet the requirements of special provision B14. This provision requires each tank to be insulated. Thus, even if transported at ambient temperatures, any gas meeting the poisonous by inhalation criteria must be in insulated cargo tanks with a design service temperature of at least minus 100 °F. This was not RSPA's intent. To correct this oversight, RSPA proposes to remove the reference to "Note 11" in § 178.337–1(e)(*1*). Therefore, Note 11 would be applicable only when specified for a particular entry in the § 173.315(a) Table.

Paragraph (e)(2) prescribes that cargo tanks used in chlorine service must have insulation of corkboard or polyurethane foam. The Chlorine Institute petitioned (P–1062) RSPA to authorize the use of a ceramic fiber/fiberglass insulation, as currently allowed for tank cars in chlorine service. The Chlorine Institute pointed out that based on a study, initiated by the Chlorine Institute in 1982, the thermal protection system can protect chlorine cargo tanks below the 483 °F chlorine/iron reaction temperature experienced in a pool fire, for at least 100 minutes. RSPA agrees that the experience record for the use of this insulation on chlorine tank cars is satisfactory and that it is suitable for cargo tanks. RSPA proposes to revise § 178.337–1(e)(2) to authorize the use of ceramic fiber/fiberglass insulation.

Section 178.337–9

Paragraph (b)(7)(i) would be revised to remove a restriction that hose, piping, or tubing used for loading or unloading may not be mounted or carried on a cargo tank. See earlier preamble discussion to § 173.315 in this NPRM.

Section 178.337–11

RSPA proposes to implement a recommendation made by the National Transportation Safety Board (NTSB) in connection with an accident involving release of a toxic lading from an MC 331 cargo tank during an unloading operation. NTSB concluded that the release occurred due to the failure of a fitting on the output side of the cargo tank discharge pump. The only method of stopping the flow of lading was to close the internal shut-off valve, but the valve control was located in the same equipment cabinet as the leaking transfer pump. The NTSB recommended (H–90–91) that controls for internal shut-off valves for the discharge system be installed at remote locations on DOT specification cargo tanks that are used for the transportation of any hazardous material. This proposed change would be contained in paragraph (a)(2) for new construction.

Section 178.338–9

When more than one cargo tank is made to the "same design," § 178.338–9(c) requires that only one cargo tank must be subjected to a full holding time test at the time of manufacture. Each subsequent cargo tank made to the same design may be performance tested during its first trip. A petitioner requested (P–1004) that RSPA also allow verification of the holding time on the first trip for subsequent cargo tanks constructed with a minor change in the length of the tank from the original design. RSPA agrees that certain minor variations are acceptable for cargo tanks constructed to the same design taking into account the safety factor included in the holding time criteria. Therefore, RSPA proposes to remove the definition of "same design" in § 178.338–9(c)(2) and to add a reference to the definition of "same design" contained in § 178.320. The definition, contained in § 178.320, provides for minor design variations and applies to all DOT specification cargo tanks, including MC 338 cargo tanks. Therefore, this change will eliminate an inconsistency.

Section 178.338–11

Paragraph (c) contains requirements for each liquid filling and liquid discharge line on a cargo tank intended for service transporting a flammable lading. Based on an NTSB recommendation [H–90–91], paragraph (c) would be revised to make these provisions applicable to all newly constructed DOT specification MC 33*P* cargo tanks.

Section 178.345–1

Paragraph (i)(2) requires that any void space within connecting structures joining multiple cargo tanks in a cargo tank motor vehicle must be vented to the atmosphere using a drain of at least 1 inch inside diameter. The Truck Trailer Manufacturers Association (TTMA) petitioned (P–1135) RSPA to remove the restriction on the size of the drain opening. TTMA stated that the length of the void space can vary depending on whether bulkhead dishes are nested or opposed, and submitted a sketch of a design in which the longitudinal distance between nested bulkheads is only one-fourth inch. RSPA agrees that the size of this drain hole should be determined in light of cargo tank design details and by functional requirements.

Paragraph (i)(2) also requires that inspection openings be provided in the connecting structure to permit inspection of interior surfaces. TTMA (P–1135) and another petitioner (P–1134) stated that it is difficult to perform an adequate visual inspection of surfaces inside this void. TTMA said that an inspector would have to enter this void space in order to perform a visual inspection. Therefore, the bulkheads would have to be 18-inches apart to permit installation of a manhole assembly. Finally, TTMA stated that head-to-shell welds always are on the lading side of the bulkheads; thus, inspecting the void would serve no useful purpose. TTMA provided no technical information to substantiate its claim that these areas are corrosion free. As the result of an investigation of a major accident involving an MC 312 cargo tank, the NTSB concluded that the cause of the tank's failure was severe corrosion in the void space between the shell and hat-shaped ring stiffeners; material thickness was found to have been reduced by 50 percent in the area of the failure. The space was provided with a drain hole of 0.375-inch diameter. The NTSB recommended [H–83–29] that RSPA prohibit design configurations that create air cavities adjacent to external cargo tank sheet material and to eliminate exceptions

based on provisions for venting and draining. A related recommendation [H-83-30] called for periodic external visual inspection of surfaces obscured by appurtenances, structural members, etc.; these provisions have been incorporated in §§ 180.405 and 180.407. However, the void between double bulkheads presents the same conditions as closed-section ring stiffeners, and thus it is important to provide a means of inspecting interior surfaces, particularly the shell in the vicinity of the bottom centerline of the tank.

For these reasons, RSPA solicits information on suitable dimensional controls for these drains, how often these areas are inspected, the conditions revealed during such inspections, and the availability of equipment for inspecting these areas.

Section 178.345-3

Paragraph (c)(3), which deals with longitudinal forces due to acceleration and deceleration, defines the longitudinal force at the key support members as 0.75 times the vertical reaction in the case of decelerative forces, but as 0.75 times the static weight of the entire cargo tank in the case of the accelerative forces. TTMA (P-1124) and another petitioner (P-1134) requested a revision to paragraphs (c)(3) (iv) and (v) to correct the calculations by considering the load at the kingpin or turntable pivot.

Longitudinal forces acting on the cargo tank wall during acceleration and deceleration are applied differently depending upon the configuration of the cargo tank motor vehicle. For example, a truck-mounted cargo tank is supported by the chassis of the truck. Vertical reactions to the static weight of a fully loaded cargo tank motor vehicle occur at the truck suspension assemblies, and the longitudinal forces in acceleration and deceleration are applied at the surface of the road. These forces are transmitted between the truck chassis and the cargo tank through structural supports and anchors; they are broadly distributed through the truck-to-tank support structure. In this configuration, stresses in the cargo tank wall due to axial loads and bending moments generated by longitudinal forces are comparatively low under both acceleration and deceleration, being shared by the chassis of the truck. A conventional semi-trailer cargo tank, however, is supported at the front by the tractor through the upper coupler (fifth wheel) and at the rear by the trailer suspension. These longitudinal forces are concentrated locally at two points and vary according to the direction of the application. All accelerative forces are transmitted from the tractor to the cargo tank motor vehicle through the upper coupler, while decelerative forces are applied both through the horizontal pivot of the upper coupler (fifth wheel) or turntable, and at the trailer suspension assembly, applied at the surface of the road. The distribution of braking loads between the tractor and the trailer must be considered in this configuration. Therefore, RSPA proposes to revise paragraphs (c)(3) (iv) and (v), as suggested by the petitioners. RSPA also proposes to make other minor editorial changes to paragraph (c)(3) and to reconstruct the paragraph for clarity.

Also a petitioner requested that § 178.345-3(c) be revised by adding a sentence as follows: "These calculations may be made using a weld joint efficiency of 1.0 in place of that value found in UW-12 of the ASME Code." The petitioner stated that the use of the joint efficiency values tabulated in UW-12 is required in § 178.345-3(b) for analysis of static stresses of the cargo tank motor vehicle. If these joint efficiency factors were used in calculating stresses due to dynamic and accident induced loads, the petitioner stated that unrealistically high stresses would be obtained for the following reasons: (a) The specified highway dynamic loads are maximum combined loads which probably are not seen in the life of a cargo tank; (b) a four-to-one safety factor already is included in the allowable stress; and (c) the ASME Code does not require the consideration of combined stresses as currently required in § 178.345-3 (c) and (d). As an example, the petitioner stated that applying these joint efficiency factors in calculation of dynamic stresses for a typical aluminum DOT 407 cargo tank would increase weight by 690 pounds, resulting in a cost increase of $1460.00 and a loss of 96 gallons in cargo capacity. Further, the petitioner contends that its successful experience in building more than 30,000 cargo tank motor vehicles over 40 years demonstrates the structural reliability of cargo tanks designed by established industry techniques without using ASME Code weld efficiencies in calculation of dynamic stresses.

RSPA agrees, in part, with the petitioner. Paragraph (a), concerning general requirements and acceptance criteria, states "* * * the maximum calculated design stress at any point in the tank wall may not exceed the maximum allowable stress value prescribed in section VIII of the ASME Code, or 25 percent of the tensile strength of the material used at design conditions." This requirement applies to welds as well as to heads, shell and other members which are designed to carry part of the structural loading of the cargo tank motor vehicle. It is pointed out that paragraph (a)(3) permits the use of alternate tests or analytical methods in place of the procedures described in paragraphs (b), (c) and (d) provided they are accurate and verifiable.

As the petitioner stated, the efficiency values for weld joints addressed in UW-12 are required for stress analysis under static conditions as prescribed in paragraph (b); these efficiencies are not applicable to analyses of dynamic loads and combined static and dynamic loads such as those described in paragraph (c). Therefore, RSPA considers the additional text suggested by the petitioner as unnecessary and it is not included in this proposed rule.

Section 178.345-5

RSPA proposes to include a recommendation made by the NTSB in connection with an accident involving the overturn of an MC 306 cargo tank and a subsequent gasoline fire. NTSB concluded that lading was released through an opening in a manhole cover, "most likely after a liquid-level sensor was dislodged by a dynamic surge of the gasoline cargo." The NTSB recommended [H-91-34] that all fittings and devices mounted on a manhole cover of cargo tanks be required to meet the same performance standard to withstand the static internal fluid pressure as that required for the manhole cover. This proposed change would clarify that manhole assemblies must be tested with all fittings and devices in place. This proposed change would be contained in paragraph (b).

Section 178.345-6

RSPA proposes to make a minor editorial change to the requirements, concerning supports and anchoring requirements. This change would clarify the requirement that design calculations of the support elements must include the stresses described in § 178.345-3(c).

Section 178.345-13

A paragraph heading, "Leakage test." would be added to paragraph (c).

Section 178.345-14

Minor editorial changes would be made to paragraph (d) for clarity.

Section 178.345-15

A petitioner (P-1134) pointed out that § 178.340-10(a)(2) allows cargo tanks not meeting all of the applicable specification requirements to be affixed with a metal certification plate without a compliance date being stamped on the

plate. The petitioner requested that similar provisions be allowed for DOT 400-series cargo tank motor vehicles manufactured with specification shortages. RSPA agrees that similar provisions should be made for DOT 400 series cargo tanks. These requirements are proposed in new paragraph (e).

Section 178.346–1

A petitioner (P–1134) requested that RSPA amend paragraph (d) to grant two additional exceptions from the ASME Code to allow the use of a single full fillet lap joint without plug welds for longitudinal seams with an assigned weld joint efficiency of 0.45 and to waive the requirements contained in paragraph UW–9(d) of the ASME Code. To support the request, the petitioner stated, in part:

Table UW–12 of the ASME Code does not allow single, full, fillet lap joints to be used as longitudinal seams. In addition, UW–9 requires that vessels made up of two or more courses shall have the centers of the welded longitudinal joints of the adjacent courses staggered or separated by at least five times the thickness of the thicker plate. Furthermore, a full radiographic examination of the longitudinal joint 4 inches either side of the circumferential welded intersection is the only provision for an exemption to the staggered requirement in UW9.* * *

Elliptical tanks have low MAWPs, routinely 3.3 psi, and thus have very low circumferential, or hoop stress. The longitudinal joints are stressed at very low levels. Calculating circumferential stresses in oval vessels is complex and requires numerous assumptions with several established techniques that can be used.* * *

Use of the single fillet lap seam allows us to install our baffles and bulk heads with the top 42 inches of the tank open. This technique assures a close fit of the head or baffle flanges to the bottom of the tank. This has been very effective in assuring against intercompartment leaks as the tank ages. Another advantage is our employees spend considerably less time inside the closed up vessel, considered by OSHA as confined space.* * *

The petitioner further stated that its company has been manufacturing aluminum and steel tanks for many years, all having two single fillet lap seams without plug welds. The petitioner has no knowledge of any structural problems experienced with this joint configuration, or with nonstaggered welds.

RSPA has reviewed the information supplied by the petitioner and believes the petitioner's request has merit based on its years of experience with no adverse effect on safety. RSPA proposes to add these exceptions in paragraph (d). However, because this welding procedure is limited to the top of the cargo tank motor vehicle, RSPA proposes similarly to limit the procedure to the top 25 percent of the cargo tank motor vehicle circumference.

Section 178.346–2

A minor editorial change would be made to paragraph (a).

Section 178.346–3

This section provides that DOT 406 cargo tank motor vehicles must conform to the structural integrity requirements contained in § 178.345–3. A petitioner (P–1134) requested an exception from the requirements on allowable compressive stresses. The petitioner stated the following:

Section 178.346–3 on structural integrity should be changed as follows:

The structural integrity of each cargo tank motor vehicle must conform to 178.345–3 except that allowable compressive stresses for cargo tanks having r/t values over 200 may be determined by the following formula, and need not comply with paragraph UG–23(b) of the ASME Code. However, in no case should the calculated compressive stress be greater than 25% of the ultimate strength.

Compressive critical buckling stress

$$S_b = \frac{\left(\frac{\pi}{4}\right)^2 E}{\left[\frac{R_1}{t_s}\right]\left[1+\frac{\left[\frac{R_1}{t_s}\right]^{\frac{1}{2}}}{35}\right]^2}$$

Where:

The actual compressive stress due to combined bending loads, S_c shall not exceed 0.67 of S_b.

E = modulus of elasticity of material at design temperature.

R_1 = inside radius of shell.

t_s = minimum thickness of shell less corrosion allowance.

S_b = Compressive critical buckling stress.

S_c = compressive stress due to combined bending loads.

The above equation is taken from the Alcoa Structural Handbook. * * * It is based on Euler's formula for cylindrical columns, empirically modified by their experience with curved plates, thin walled tubes, and cylinders. The values obtained from Alcoa's approach are less conservative than ASME but more conservative than other alternatives.

We believe using 67 percent (1.5 factor of safety) of the value given in this formula applied to the dynamic loading is sufficient in view of the fact that high dynamic loads are infrequent and the shells are well reinforced by heads, baffles and longitudinal stiffeners. The use of the Alcoa approach with a 1.5 factor of safety is based upon 40 years of cargo tank building experience.

Allowable compressive stresses in the ASME Code were developed basically for cylindrical vessels, vessels not necessarily reinforced either circumferentially or longitudinally.

DOT 406 cargo tanks have circumferential reinforcements spaced no more than 60" apart longitudinally and have two longitudinal overturn rails which substantially reinforce the top of the cargo tank against critical buckling.

Most DOT 406 cargo tanks will be designed with elliptical or oval cross sections in order to lower the center of gravity of the cargo tank. These sections have large top and bottom shell radii. These large radii result in higher r/t values. These large values for r/t used in ASME calculations reduce allowable compressive stresses to low levels. Over thirty-five years experience with these designs, lead us to believe the approach in ASME VIII, UG–23(b) is unnecessary.

Most of the nation's 50,000, or so, oval aluminum tanks currently in service were designed using the aluminum company formula for allowable compressive stresses. The apparent structural success of these tanks substantiates our argument.

If we cannot get relief from the ASME Code's allowable compressive stresses, a typical DOT 406 cargo tank will weigh 530 pounds more with a resulting loss of 87 gallons of cargo capacity. This means that for every 98 MC 306 cargo tank motor vehicles in service, 99 DOT 406 cargo tank motor vehicles will be required to transport equal amounts of hazardous materials. Therefore, an additional 510 vehicles would be required in the nation's fleet.

This suggested procedure applies only to oval aluminum cargo tank motor vehicles having two full length horizontal overturn rails. However, the petitioner's suggested regulatory text would apply the procedure to all DOT 406 cargo tanks, regardless of material, cross-section, or configuration of the overturn device.

RSPA does not agree that this procedure is applicable to all DOT 406 cargo tanks. However, in an effort to recognize standards that may provide better manufacturing procedures, RSPA solicits comments on the suggested procedure for calculation of compressive stresses.

Section 178.346–10

Paragraph (c)(1) prescribes pressure settings of relief valves on DOT 406 cargo tanks. The opening and closing schedules for primary relief valves on DOT 406 cargo tanks adopted in the June 12, 1989 final rule were revised by RSPA in response to the merits of petitions for reconsideration. Petitioners stated that requiring pressure relief valves to reclose at 90% of set pressure (108% Maximum Allowable Working Pressure (MAWP)) would not allow "a valve seat to lift high enough" to attain the large airflows prescribed in the specification. The commenters recommended that the reclosing requirement be reduced to 75% of set pressure, actually below MAWP. RSPA responded to the petitions for reconsideration in a September 7, 1990 final rule by revising the set pressure from a minimum of 120% MAWP to 125% MAWP, with a minimum of 3.3 psig, and by requiring that reclosing occur at no less than the MAWP.

It was brought to RSPA's attention that these changes effectively reduced the average difference in pressure across the valve during the venting cycle. The difference in pressure between the point at which the valve begins to open (set pressure) and the point at which it is fully open (test pressure) is an important parameter with respect to the rate of flow across the valve opening. For purposes of this discussion, this difference in pressure is called "differential pressure." When plotted, a differential pressure of 1.7 psi is derived at the minimum 2.65 psi MAWP, based on the requirement that the test pressure be no less than 5.0 psig. However, this differential decreases rapidly as the MAWP increases up to the point where 1.5 times MAWP equals 5.0 psig (3.333 psig MAWP); at this point, differential pressure is only 0.834 psi. From that point, the differential pressure rises progressively to 1.0 psi at 4.0 psig MAWP. For low MAWPs, this relationship provides both increased pressure differential and increased assurance of structural integrity. However, the changes in opening and closing schedules for primary pressure relief valves on DOT 406 cargo tanks have an adverse effect on flow ratings of these valves at higher MAWPs.

A petitioner requested changes in the pressure relief valve opening and closing requirements and in the test pressure, stating the changes would enable compliance with all requirements for DOT 406 dual function vents. The petitioner stated that the suggested changes would provide for higher differential pressures over the entire range of MAWP, but the changes proposed also would reduce the differential in the mid-range of MAWP; in this case, the lowest differential would be 1.25 psi at an MAWP of 3.125 psig. Under the petitioner's recommended schedule, the set pressure would be reduced to not less than 120 percent of the MAWP (as opposed to 125 percent) or 3.3 psig, whichever is greater, and the test pressure would be increased to 1.6 times MAWP (as opposed to 1.5 times MAWP). The minimum test pressure of 5.0 psig would remain unchanged.

Additionally, TTMA commented on the difficulty of obtaining adequate flow with the narrow range of "set to test pressure." TTMA recommended changes in both pressure relief valve scheduling and test pressures. The recommended schedule would provide for set pressure to be not less than 110 percent MAWP, thus achieving higher differential pressures at the low end of the MAWP range without eliminating the reduced differential in the mid-range of MAWP. Also, TTMA recommended that manufacturers be allowed to specify test pressures in excess of 1.5 times MAWP.

RSPA agrees with the petitioners that the difference between set pressure and test pressure should be increased for primary pressure relief valves on DOT 406 cargo tanks. Therefore, RSPA is proposing to revise § 178.346–10(c)(1) to permit DOT 406 cargo tanks to have the same set pressure and test pressure as prescribed in § 178.345–10(d)(1), and as prescribed for DOT 407 and 412 cargo tanks, except that the reclosing pressure would remain at "no less than MAWP." In addition, the unintended, non-functional reduction in differential pressure in the mid-range of MAWPs would be eliminated by expressing test pressure simply as 2.4 psi above MAWP, i.e., test pressure would vary from 5.05 psig for an MAWP of 2.65 psig to 6.4 psig for an MAWP of 4.0 psig. This would result in a differential pressure of 1.87 psi at the low end of the MAWP range, progressively diminishing to 1.6 psi at the high end. The small increase in test pressures is in line with the increases requested by petitioners except that it is limited to a maximum of 0.75 above the previous schedule. In view of the improved structural integrity of DOT 406 cargo tanks, no deleterious effects are expected.

Section 178.346–13

Paragraph (b) containing requirements for pressure test would be revised for consistency with the proposed changes to § 178.346–10. Refer to earlier preamble discussion to § 178.346–10.

Paragraph (c)(2) authorizes the use of the Environmental Protection Agency's (EPA) Method 27 "Determination of Vapor Tightness of Gasoline Delivery Tank Using Pressure-Vacuum Test" as an alternative to the leakage test prescribed in § 178.345–13(c)(2), where applicable. RSPA has received numerous questions concerning this leakage test; in particular, the meaning of the phrase "where applicable" has been questioned. The intent of this phrase is to allow the use of this alternative leakage test in geographical locations where the EPA Method 27 vapor-tightness test is mandated. It was intended to relieve the burden of duplicate requirements for cargo tanks subject to this test in those locations where EPA has determined that release of gasoline vapors constitutes a hazard to the environment.

TTMA requested, in petition (P–1115), that the EPA Method 27 test for vapor-tightness be authorized for all DOT 406 cargo tanks without regard to whether they are: (1) Used in gasoline delivery, (2) fitted with vapor collection equipment, or (3) subject to this test under EPA rules. TTMA stated that a manufacturer may not know under what local air pollution requirements the cargo tank may operate. TTMA pointed out that EPA also references use of EPA Method 27 for benzene.

It is RSPA's position that if a manufacturer does not provide vapor collection equipment as part of the completed cargo tank, the manufacturer may not use EPA Method 27 but must perform leak testing in accordance with § 178.345–13(c); i.e., at not less than 80 percent of MAWP. RSPA believes there is merit in extending this alternative test for benzene, but RSPA has received no data to support the use of Method 27 for other than DOT 406 cargo tanks, or for other ladings. Therefore, RSPA proposes to revise paragraph (c)(2) to allow use of EPA Method 27 as an alternative leakage test for DOT 406 specification cargo tanks that are fitted with vapor

collection equipment and are intended for use in gasoline or benzene delivery service only. Additionally, EPA Method 27 would be allowed for these cargo tanks without regard to geographical location.

Section 180.403

This section defines "rebarrelling" to mean replacing more than 50 percent of the combined shell and head material of a cargo tank. TTMA requested that the definition for "rebarrelling" be revised to mean replacement of more than 50 percent and less than 100 percent of the combined shell and head material. TTMA also requested that a new definition for "replacement of barrel" be added to cover the complete replacement of the tank with a newly constructed tank using only new materials. RSPA has included TTMA's suggestions in the proposal. TTMA suggested several other changes to requirements pertaining to the rebarrelling of cargo tanks. These changes are addressed in the preamble discussion to § 180.413.

Section 180.405

In paragraph (f), minor editorial changes would be made in subparagraphs (f)(1)(iii) and (f)(4). In paragraph (g)(2), RSPA proposes to implement the NTSB recommendation [H–91–34] on manhole cover fittings. See earlier preamble discussion for § 178.345–5.

Section 180.407

Paragraph (c) prescribes compliance dates for periodic test and inspection of specification cargo tanks. The Chlorine Institute has requested that MC 330 and MC 331 cargo tanks used in chlorine service be leakage tested every two years, in conjunction with the pressure test, in place of an annual test. Because of the odor of chlorine, a leak in a cargo tank transporting this material would be readily detected. Therefore, RSPA agrees with the Chlorine Institute and proposes to extend the frequency of the leakage test to two years.

Paragraphs (e)(4) and (f)(3) both prescribe that degraded or defective areas of a cargo tank liner must be removed and the tank wall below the defect must be inspected. Therefore, RSPA proposes to remove the duplicative requirement in paragraph (e)(4).

Paragraph (g)(1)(iv), covering the pressure test of specification cargo tanks, would be revised to correct the test pressure prescribed for DOT 406 cargo tank motor vehicles for consistency with the proposed changes to § 178.346–10. Refer to preamble discussion to § 178.346–10.

Paragraph (h)(2) would be revised to permit the use of the EPA Method 27 vapor tightness test on any cargo tank fitted with a vapor recovery system and used in gasoline or benzene service. Refer to preamble discussion to § 178.346–13(c)(2).

Paragraph (i) prescribes that the heads and shell of all unlined cargo tanks used for the transportation of materials corrosive to the tank must be thickness tested. A new paragraph (5) containing a minimum thickness table for steel and aluminum would be added. The values contained in this table are based on the size of sheets and plates authorized for the MC 300, MC 301, MC 302, MC 303, MC 304, MC 305, MC 306, MC 307, MC 310, MC 311, and MC 312 specifications for manufacture of heads and shells. The nomenclature used to express minimum thicknesses has varied over the years. For example, steel thicknesses generally have been expressed in terms of U.S. Standard Gauge, but in the MC 303 specification, both gauge values and decimal values were shown. Thickness values for aluminum generally have been expressed in decimals, but for the MC 302 specification, both gauge values and decimal values were shown. In other cases, calculation of thickness values were required. For example, for the MC 304 specification, the values for aluminum had to be calculated by multiplying the gauge values listed for mild steel by a factor of 1.44; and in the case of the MC 312 specification, the values for aluminum must be calculated from tabulated gauge values using a formula set forth at § 178.343–2(a)(1).

In this proposed rule, a multiplication factor of 1.44 is used to derive the values for minimum thicknesses of aluminum cargo tanks contained in the proposed table § 180.407(i)(5). The nominal thicknesses in the table range from 19 gauge to 3/8" for steel and 0.078" to 0.540" for aluminum.

Note: Editions of the National Tank Truck Carriers' (NTTC) publication "Cargo Tank Hazardous Material Regulations", prior to 1992, interchanged the minimum thickness tables in the MC 303 specification with that contained in the MC 305 specifications.

Section 180.413

This section provides that any repair, modification, stretching, or rebarrelling must be performed by a cargo tank manufacturer holding an ASME "U" stamp or a repair facility holding a National Board "R" stamp. TTMA objects to a repair facility being allowed to rebarrel 100-percent of a cargo tank. TTMA stated that mounting a cargo tank on a motor vehicle requires the proper attachment to: (1) The upper coupler and undercarriage supporting structure on a frameless cargo tank motor vehicle; or (2) the frame on a cargo tank motor vehicle chassis in accordance with the applicable specification. TTMA further stated that, under the National Board Inspection Code, any alteration involving physical changes must be made by an organization holding an ASME "U" stamp, or by an organization holding a National Board "R" stamp provided the change in design is documented by an organization holding an ASME "U" stamp. TTMA also takes the position that a repair facility should not be allowed to modify or stretch a cargo tank without guidance from a Design Certifying Engineer. TTMA pointed out that § 180.403 defines "modification" or "stretching" as any change to the original design and construction of a cargo tank which affects its structural integrity and that § 180.413(d)(2) requires the person performing the stretching to "have knowledge of the original design concept" and to "assure compliance with the rebuilt cargo tank's structural integrity." Therefore, the same requirements should apply to a person responsible for a modification. TTMA stated essentially the same skills are necessary to modify, stretch, or replace a cargo tank as to design and construct a new cargo tank. Hence, the person should have possession of an ASME "U" stamp or a National Board "R" stamp and authorization and guidance from, and certification by, a Design Certifying Engineer should be required for these activities.

RSPA believes TTMA's request has merit. However, significant changes were made in the National Board Inspection Code, effective July 1, 1992. The National Board revised its inspection code to prohibit the repair, modification, stretching, or rebarrelling of an ASME-stamped cargo tank by a manufacturer who holds an ASME "U" stamp but not a National Board "R" stamp. The National Board informed RSPA that this change was made because the National Board lacks jurisdiction over the quality of work for these activities when performed by manufacturers. Therefore, in view of TTMA's request and the change in the National Board Inspection Code, RSPA proposes to revise this section so that any repair, modification, stretching or rebarrelling of an ASME Code-stamped cargo tank must be performed by a repair facility holding a National Board "R" stamp. The current provisions allowing these activities to be performed on non-ASME-stamped cargo tanks by a

manufacturer holding an ASME "U" stamp or a National Board "R" stamp would be retained.

E. Rulemaking Analyses and Notices

1. Executive Order 12291 and DOT Regulatory Policies and Procedures

This notice of proposed rulemaking has been reviewed under the criteria specified in section 1(b) of Executive Order 12291 and: (1) Is determined not to be a major rule under Executive Order 12291; (2) does not require a Regulatory Impact Analysis; and (3) is determined not to be significant under DOT's regulatory policies and procedures (44 FR 11034; February 26, 1979). This proposed rulemaking would not impose additional requirements and, in fact, would provide regulatory and economic relief in some areas. A draft Regulatory Evaluation has been placed in the docket.

2. Executive Order 12612

The proposed rule has been analyzed in accordance with the principles and criteria in Executive Order 12612 ("Federalism").

The Hazardous Materials Transportation Act (49 App. U.S.C. 1801–1819) contains express preemption provisions (49 App. U.S.C. 1811) that preempt a non-Federal requirement if: (1) Compliance with both the non-Federal and the Federal requirement is not possible; (2) the non-Federal requirement creates an obstacle to accomplishment of the Federal law or regulations; or (3) it is preempted under section 105(a)(4), concerning certain covered subjects, or section 105(b), concerning highway routing. Covered subjects include:

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

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

(iii) The preparation, execution, and use of shipping documents pertaining to hazardous materials and requirements respecting the number, content, and placement of such documents;

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

(v) The design, manufacturing, fabrication, marking, maintenance, reconditioning, repairing, or testing of a package or container which is represented, marked, certified, or sold as qualified for use in the transportation of hazardous materials. (49 App. U.S.C. 1804(a)(4) (A) and (B)).

This proposed rule concerns design, manufacturing, repairing, and other requirements for packages represented as qualified for use in the transportation of hazardous materials. If adopted as final, this rule would preempt any State, local, or Indian tribe requirements concerning this subject unless the non-Federal requirements are "substantively the same" (56 FR 20424, May 13, 1992) as the Federal requirement. Thus, RSPA lacks discretion in this area, and preparation of a federalism assessment is not warranted.

3. Regulatory Flexibility Act

I certify that this proposal would not, if promulgated, have a significant economic impact on a substantial number of small entities. There are no direct or indirect adverse economic impacts for small units of government, businesses, or other organizations.

4. Paperwork Reduction Act

This notice of proposed rulemaking would have no changes to the information collection and recordkeeping requirements contained in the June 12, 1989 final rule, which were approved by the Office of Management and Budget (OMB) under the provisions of 44 U.S.C. chapter 35 and assigned control number 2137–0014.

5. Regulation Identifier Number (RIN)

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

6. National Environmental Policy Act

RSPA has concluded that this proposal would have no significant impact on the environment and does not require the preparation of an environmental impact statement under the National Environmental Policy Act.

List of Subjects

49 CFR Part 173

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

49 CFR Part 178

Hazardous materials transportation, Motor vehicles safety, Packaging and Containers, Reporting and recordkeeping requirements.

49 CFR Part 180

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

In consideration of the foregoing, title 49, chapter I of the Code of Federal Regulations, would be amended as set forth below:

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

1. The authority citation for part 173 would continue to read as follows:

Authority: 49 App. U.S.C. 1803, 1804, 1805, 1806, 1807, 1808, 1817; 49 CFR part 1, unless otherwise noted.

§ 173.225 [Amended]

2. In § 173.225, in paragraph (e)(2), the phrase "MC 310, MC 311, MC 312, and DOT 412" would be revised to read "MC 307, MC 310, MC 311, MC 312, DOT 407, and DOT 412".

3. In § 173.315, paragraph (o)(1) and the first sentence in paragraph (o)(2) would be revised to read as follows:

§ 173.315 Compressed gases in cargo tanks and portable tanks.

* * * * *

(o) * * *

(1) Any hose, piping, or tubing used for loading or unloading that is mounted or carried on the motor vehicle may not be attached to any valve and must be capped at all ends to prevent the entry of moisture, except at the time of loading or unloading. Except at the time of loading and unloading, the pipe connection of each angle valve must be closed with a screw plug which is chained or otherwise fastened to prevent misplacement.

(2) Each chlorine cargo tank angle valve must be tested to be leak free at not less than 225 psig using dry air or inert gas before installation and thereafter every 2 years when performing the required periodic retest in § 180.407(c) of this subchapter. * * *

* * * * *

§ 173.315 [Amended]

4. In addition, in the table in § 173.315(a), for the entry "Nitrous oxide, refrigerated liquid", in Column 4, the ditto notation "do" is removed and replaced with "DOT–51, MC–330, MC–331.".

PART 178—SPECIFICATIONS FOR PACKAGINGS

5. The authority citation for part 178 would continue to read as follows:

Authority: 49 App. U.S.C. 1803, 1804, 1805, 1806, 1808; 49 CFR Part 1.

6. In § 178.337–1, paragraph (e)(2) would be amended by revising the last sentence to read as follows:

§ 178.337–1 General requirements.

* * * * *

(e) * * *

(2) * * * Insulating material used on tanks for chlorine must be corkboard or polyurethane foam, with a minimum thickness of 4 inches, or 2 inches minimum thickness of ceramic fiber of 4 pounds per cubic feet minimum density covered by 2 inches minimum thickness of glass fiber.

* * * * *

§ 178.337–1 [Amended]

7. In addition, in § 178.337–1, the following changes would be made:

a. In paragraph (a)(3), the reference "173.33(i)" would be revised to read "178.337–1(e)(2)" and the reference "173.315(a) Table Note 11" would be revised to read "173.315(a) Table".

b. In paragraph (e)(1), the reference "173.315(a) Table, Note 11" would be revised to read "173.315(a) Table".

§ 178.337–9 [Amended]

8. In § 178.337–9, paragraph (b)(7)(i) would be removed, and paragraphs (b)(7)(ii) and (b)(7)(iii) would be redesignated as paragraphs (b)(7)(i) and (b)(7)(ii), respectively.

§ 178.337–11 [Amended]

9. In paragraph (a)(2) introductory text, in the first sentence, the phrase "a flammable compressed gas" would be revised to read "a compressed gas".

10. In § 178.338–9, paragraph (c)(2) would be revised to read as follows:

§ 178.338–9 Holding time.

* * * * *

(c) * * *

(2) *Same design.* The term "same design" as used in this section means cargo tanks made to the same design type. See § 178.320(a)(3) for definition of "design type".

* * * * *

11. In § 178.338–11, in the introductory text in paragraph (c), the first sentence would be revised to read as follows:

§ 178.338–11 Discharge control devices.

* * * * *

(c) Each liquid filling and liquid discharge line must be provided with a remotely controlled shut-off valve. * * *

* * * * *

12. In § 178.345–1, the first two sentences in paragraph (i)(2) would be revised to read as follows:

§ 178.345–1 General requirements.

* * * * *

(i) * * *

(2) The strength of the connecting structure joining multiple cargo tanks in a cargo tank motor vehicle must meet the structural design requirements in § 178.345–3. Any void within the connecting structure must be vented to the atmosphere and have a drain which must be kept open at all times. * * *

* * * * *

13. In § 178.345–3, paragraphs (c)(3) and (c)(4) would be revised to read as follows:

§ 178.345–3 Structural integrity.

* * * * *

(c) * * *

(3) S_x = The net longitudinal stress generated by the following loading conditions, in psi:

(i) The longitudinal stresses resulting from the MAWP and from the lowest pressure at which the cargo tank may operate, in combination with the bending stress generated by the static weight of the fully loaded cargo tank, all structural elements, equipment and appurtenances supported by the cargo tank wall;

(ii) The tensile or compressive stress resulting from longitudinal acceleration or deceleration. In each case, the forces applied must be at least 0.75 times the vertical reaction at each suspension assembly, applied at the road surface, and as transmitted to the cargo tank wall through suspension assembly, the horizontal pivot of the upper coupler (fifth wheel) or turntable, and anchoring and support members, as applicable. The vertical reaction must be calculated based on the static weight of the fully loaded cargo tank, all structural elements, equipment and appurtenances supported by the cargo tank wall. The following loadings must be included:

(A) The axial load generated by a decelerative force;

(B) The bending moment generated by a decelerative force;

(C) The axial load generated by an accelerative force; and

(D) The bending moment generated by an accelerative force; and

(iii) The tensile or compressive stress generated by the bending moment resulting from an upward vertical accelerative force equal to at least 0.75 times the vertical reaction at each suspension assembly, applied at the road surface, and as transmitted to the cargo tank wall through suspension assembly, the horizontal pivot of the upper coupler (fifth wheel) or turntable, and anchoring and support members, as applicable. The vertical reaction must be calculated based on the static weight of the fully loaded cargo tank, all structural elements, equipment and appurtenances supported by the cargo tank wall.

(4) S_y = The following shear stresses that apply, in psi:

(i) The vertical shear stress generated by an upward vertical accelerative force equal to at least 1.7 times the vertical reaction at each suspension assembly, applied at the road surface, and as transmitted to the cargo tank wall through suspension assembly, the horizontal pivot of the upper coupler (fifth wheel) or turntable, and anchoring and support members, as applicable. The vertical reaction must be calculated based on the static weight of the fully loaded cargo tank, all structural elements, equipment and appurtenances supported by the cargo tank wall;

(ii) The lateral shear stress generated by a lateral accelerative force equal to at least 0.4 times the vertical reaction at each suspension assembly, applied at the road surface, and as transmitted to the cargo tank wall through the suspension assembly, the horizontal pivot of the upper coupler (fifth wheel) or turntable, and anchoring and support members, as applicable. The vertical reaction must be calculated based on the static weight of a fully loaded cargo tank, all structural elements, equipment and appurtenances supported by the cargo tank wall; and

(iii) The torsional shear stress generated by the same lateral forces as described in paragraph (c)(4)(ii) of this section.

* * * * *

14. In § 178.345–5, paragraph (b) introductory text would be revised to read as follows:

§ 178.345–5 Manhole assemblies.

* * * * *

(b) Each manhole, fill opening and washout assembly must be structurally capable of withstanding, without leakage or permanent deformation that would affect its structural integrity, a static internal fluid pressure of at least 36 psig, or cargo tank test pressure, whichever is greater. All fittings and devices mounted on a manhole cover must withstand the same static internal fluid pressure as that required for the manhole cover. The manhole assembly manufacturer shall verify compliance with this requirement by hydrostatically testing at least one percent (or one manhole closure, whichever is greater) of all manhole closures of each type produced each 3 months, as follows:

* * * * *

§ 178.345–6 [Amended]

15. In § 178.345–6, in paragraphs (a) and (b), the second sentence of each paragraph would be revised to read "The design calculations of the support elements must include the stresses indicated in § 178.345–3(b) and as generated by the loads described in § 178.345–3(c).".

§ 178.345–13 [Amended]

16. In § 178.345–13, a heading would be added to paragraph (c) to read "*Leakage test.*".

§ 178.345–14 [Amended]

17. In § 178.345–14, in paragraph (d), the following changes would be made:

a. The paragraph heading *"Multi-cargo tank cargo tank motor vehicle"* would be revised to read *"Multi-tank cargo tank motor vehicle"*.

b. At the end of the second sentence the phrase "unless all of the cargo tanks are identical" would be revised to read "unless all cargo tanks are made to the same specification".

18. In § 178.345–15, a new paragraph (e) would be added to read as follows:

§ 178.345–15 Certification.

* * * * *

(e) *Specification shortages.* If a cargo tank is manufactured which does not meet all applicable specification requirements, thereby requiring subsequent manufacturing involving the installation of additional components, parts, appurtenances or accessories, the cargo tank manufacturer may affix the name plate and specification plate required by § 178.345–14 (b) and (c), without the original date of certification stamped on the specification plate. The manufacturer shall state the specification requirements not complied with on the manufacturer's certification. When the cargo tank is brought into compliance with the applicable specification, the date of compliance shall be stamped on the specification plate. The Registered Inspector shall issue a Certificate of Compliance stating details of the particular operations performed on the cargo tank, and the date and person (manufacturer, carrier, or repair organization) accomplishing the compliance.

19. In § 178.346–1, a new paragraph (d)(9) would be added to read as follows:

§ 178.346–1 General requirements.

* * * * *

(d) * * *

(9) Single full fillet lap joints without plug welds may be used for longitudinal seams in arc or gas welded joints on the top one-fourth of the cargo tank circumference with an assigned weld joint efficiency of 0.45 without radiographic examination. Additionally, the requirements of paragraph UW–9(d) of the ASME Code do not apply.

§ 178.346–2 [Amended]

20. In § 178.346–2, the paragraph (a) designation is removed and the phrase "DOT 406 cargo tanks" would be revised to read "DOT 406 cargo tank motor vehicles".

21. In § 178.346–10, paragraph (c)(1) would be revised to read as follows:

§ 178.346–10 Pressure relief.

* * * * *

(c) * * *

(1) The setting of pressure relief valves must be in accordance with § 178.345–10(d)(1), except that each primary relief valve must reclose at not less than the maximum allowable working pressure (MAWP) and remain closed at lower pressures.

* * * * *

22. In § 178.346–13, paragraphs (b)(1), (b)(2), and (c)(2) would be revised to read as follows:

§ 178.346–13 Pressure and leakage tests.

* * * * *

(b) * * *

(1) Using the hydrostatic test method, the test pressure must be no less than the cargo tank MAWP plus 2.4 psi.

(2) Using the pneumatic test method, the test pressure must be no less than the cargo tank MAWP plus 2.4 psi, and the inspection pressure must be the cargo tank MAWP.

(c) * * *

(2) The Environmental Protection Agency's "Method 27—Determination of Vapor Tightness of Gasoline Delivery Tank Using Pressure-Vacuum Test," as set forth in 40 CFR part 60, appendix A, is an acceptable alternate leakage test for any cargo tank equipped with a vapor recovery system and intended for use in benzene or gasoline service.

PART 180–CONTINUING QUALIFICATION AND MAINTENANCE OF PACKAGINGS

23. The authority citation for part 180 would continue to read as follows:

Authority: 49 App. U.S.C. 1803; 49 CFR part 1.

24. In § 180.403, the definition for "Rebarrelling" would be revised and a new definition "Replacement of a barrel" would be added, in the appropriate alphabetical order, to read as follows:

§ 180.403 Definitions.

* * * * *

Rebarrelling means replacing more than 50 percent and less than 100 percent of the combined shell and head material of a cargo tank.

* * * * *

Replacement of a barrel means to replace the existing tank on a motor vehicle chassis with an unused tank (for *tank*, see § 178.345–1(c), § 178.337–1, or § 178.338–1 of this subchapter, as applicable).

* * * * *

25. In § 180.405, paragraph (g)(2) introductory text would be revised to read as follows:

§ 180.405 Qualification of cargo tanks.

* * * * *

(g) * * *

(2) On or before August 31, 1995, each owner of a cargo tank marked or certified before December 31, 1990, authorized for the transportation of a hazardous material, must have the cargo tank equipped with manhole assemblies conforming with § 178.345–5 of this subchapter, except for the dimensional requirements in § 178.345(a) of this subchapter, the hydrostatic testing requirements in § 178.345–5(b) of this subchapter, and the marking requirements in § 178.345–5(e) of this subchapter. All fittings and devices mounted on a manhole cover are part of the manhole assembly and must meet all performance standards required for the manhole cover. A manhole assembly meeting one of the following provisions is considered to be in compliance with this paragraph:

* * * * *

§ 180.405 [Amended]

26. In addition, in § 180.405 the following changes would be made:

a. In paragraph (f)(1)(iii), the phrase "prescribed in § 178.345–3 of the specification" would be revised to read "prescribed in § 178.345–3 of this subchapter or the specification".

b. In paragraph (f)(4) introductory text, the phrase "and an outlet is equipped" would be revised to read "and except that an outlet is equipped".

27. In § 180.407, in the table in paragraph (c), immediately under the subheading "Leakage Test" in the first column, the following entry would be added; paragraph (e)(4) would be removed, and paragraph (e)(5) would be redesignated as paragraph (e)(4); paragraph (h)(2) would be revised; paragraphs (i)(5) through (i)(7) would be redesignated as paragraphs (i)(6) through (i)(8), respectively; and a new paragraph (i)(5) would be added, to read as follows:

§ 180.407 Requirements for test and inspection of specification cargo tanks.

* * * * *

(c) * * *

COMPLIANCE DATES—INSPECTIONS AND RETESTS UNDER § 180.407(c)

Test or inspection (cargo tank specification, configuration, and service)	Date by which first test must be completed (see note 1)	Interval period after first test
[ADD]		
• • • • • • •		
Leakage Test:		
MC 330 and MC 331 cargo tanks in chlorine service	September 1, 1991	2 years.
• • • • • • •		

* * * * *

(h) * * *

(2) The Environmental Protection Agency's "Method 27—Determination of Vapor Tightness of Gasoline Delivery Tank Using Pressure-Vacuum Test," as set forth in 40 CFR part 60, appendix A, is an acceptable alternate leakage test for cargo tanks equipped with a vapor recovery system and intended for use in benzene or gasoline service.

* * * * *

(i) * * *

(5) Minimum thicknesses for MC 300, MC 301, MC 302, MC 303, MC 305, MC 306, MC 307, MC 310, MC 311, and MC 312 cargo tanks are shown in the minimum thickness table below. The values shown for the nominal thicknesses are those prescribed in Tables I and II of the applicable specification for construction of new cargo tanks.

MINIMUM THICKNESS TABLE

Nominal Thickness (gauge or inches)	Steel		Aluminum	
	Nominal decimal equivalent	Minimum thickness (inches)	Nominal thickness (inches)	Minimum thickness (inches)
19	0.0418	0.038	0.078	0.072
18	.0478	.043	.087	.078
17	.0538	.048	.096	.086
16	.0598	.054	.109	.098
15	.0673	.061	.130	.117
14	.0747	.067	.141	.127
13	.0897	.081	.151	.136
12	.1046	.094	.172	.155
11	.1196	.108	.173	.156
10	.1345	.121	.194	.175
9	.1495	.135	.216	.194
8	.1644	.148	.237	.213
3/16	.1875	.169	.270	.243
1/4	.2500	.225	.360	.324
5/16	.3125	.281	.450	.405
3/8	.3750	.338	.540	.486

Note: Based on 90% of nominal U.S. gauges and decimal values from DOT specification tables (values for both steel and aluminum minimums rounded to 3 places).

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§ 180.407 [Amended]

28. In addition, in § 180.407, in paragraph (g)(1)(iv), in the table, for the entry "DOT 406", column 2 would be revised to read "No less than the MAWP plus 16.6 kPa (2.4 psig)".

29. Section 180.413 would be revised to read as follows:

§ 180.413 Repair, modification, stretching, or rebarrelling of cargo tanks.

(a) *General.* For purposes of this section only, "stretching" is not considered a "modification" and "rebarrelling" is not considered a "repair." Any repair, modification, stretching, or rebarrelling of a cargo tank must be performed in conformance with the requirements of this section.

(b) *Records.* Each owner of a cargo tank must retain at its principal place of business all records of repair, modification, stretching, or rebarrelling made to each tank during the time the tank is in service and for one year thereafter. Copies of these records must be retained by a motor carrier, who is not the owner of cargo tank, at its principal place of business during the period the tank is in the carrier's service.

(c) *Repair.* (1) Non-ASME Code stamped cargo tanks. Any work involving repair on a MC 300, MC 301, MC 302, MC 303, MC 304, MC 305, MC 306, MC 307, MC 310, MC 311, or MC 312 cargo tank that is not ASME Code stamped must be performed by:

(i) A cargo tank manufacturer holding a valid ASME Certificate of Authorization for the use of the ASME "U" stamp and registered in accordance with subpart F of part 107 of subchapter B of this chapter; or

(ii) A repair facility holding a valid National Board Certificate of Authorization for the use of the National Board "R" stamp and registered in accordance with subpart F of part 107 of subchapter B of this chapter.

(2) ASME Code stamped cargo tanks. After June 30, 1992 the repair on any ASME stamped cargo tank must be performed by a repair facility holding a valid National Board Certificate of Authorization for the use of the National Board "R" stamp and registered in accordance with subpart F of part 107 of subchapter B of this chapter.

(3) The following provisions apply to cargo tank repairs:

(i) DOT 406, DOT 407, and DOT 412 cargo tanks must be repaired in accordance with the specification requirements in effect at the time of manufacture or at the time of repair;

(ii) MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 cargo tanks must be repaired in accordance with the original specification or with the DOT

406 specification in effect at the time of repair;

(iii) MC 304 and MC 307 cargo tanks must be repaired in accordance with the original specification or with the DOT 407 specification in effect at the time of repair;

(iv) MC 310, MC 311, and MC 312 cargo tanks must be repaired in accordance with the original specification or with the DOT 412 specification in effect at the time of the repair;

(v) MC 338 cargo tanks must be repaired in accordance with the specification requirements in effect at the time of manufacture or at the time of repair; and

(vi) MC 330 and MC 331 cargo tanks must be repaired in accordance with the repair procedures described in CGA Technical Bulletin TB–2 and the National Board Inspection Code—Provisions for Repair of Pressure Vessels. Each cargo tank having cracks or other defects requiring welded repairs must meet all of the requirements of § 178.337–16 of this subchapter, except that postweld heat treatment after minor weld repairs is not required. When any repair is made of defects revealed by the wet fluorescent magnetic particle inspection, including those by grinding, the affected area of the cargo tank must again be examined by the wet fluorescent magnetic particle method after hydrostatic testing to assure that all defects have been removed.

(4) Prior to any repair work, the cargo tank must be emptied of any hazardous material lading. Cargo tanks containing flammable or toxic lading must be purged.

(5) After June 30, 1992 any repair of a cargo tank involving welding on the shell or head must be certified by a Registered Inspector. Any repair of an ASME Code "U" stamped cargo tank must be in accordance with the National Board Inspection Code.

(6) The suitability of any repair affecting the structural integrity of the cargo tank must be determined by testing as prescribed in § 180.407.

(d) *Maintenance or replacement of piping, valves, hoses or fittings.* In the event of repair, maintenance or replacement, any piping, valve, or fitting must be properly installed in accordance with the provisions of the applicable specification before the cargo tank is returned to hazardous materials service. After maintenance or replacement which does not involve welding on the cargo tank wall, piping, valves and fittings must be leak tested. After repair or replacement of piping, valves or fittings which involves welding on the cargo tank wall, the cargo tank, including the repaired or replaced piping, valve or fitting, must be pressure tested in accordance with the applicable specification. Hoses permanently attached to the cargo tank must be tested either before or after installation.

(e) *Modification, stretching, or rebarrelling.* Modification, stretching or rebarrelling of a cargo tank must conform to the following provisions:

(1) *Non-ASME Code stamped cargo tanks.* (i) Any work involving modification, stretching, or rebarrelling on a MC 300, MC 301, MC 302, MC 303, MC 304, MC 305, MC 306, MC 307, MC 310, MC 311, or MC 312 cargo tank that is not ASME stamped must be performed by:

(A) A cargo tank manufacturer holding a valid ASME Certificate of Authorization for the use of the ASME "U" stamp and registered in accordance with subpart F of part 107 of subchapter B of this chapter; or

(B) A repair facility holding a valid National Board Certificate of Authorization for the use of the National Board "R" stamp and registered in accordance with subpart F of part 107 of subchapter B of this chapter.

(ii) If the modification, stretching, or rebarrelling will result in a design change, then it must be performed under the direction of a Design Certifying Engineer.

(2) *ASME Code stamped cargo tanks.* After June 30, 1992 the modification, stretching, or rebarrelling on any ASME Code stamped cargo tank must be performed by a repair facility holding a valid National Board Certificate of Authorization for the use of the National Board "R" stamp and registered in accordance with subpart F of part 107 of subchapter B of this chapter. If the modification, stretching, or rebarrelling will result in a design change, then it must be performed under the direction of a Design Certifying Engineer.

(3) All new material and equipment, and equipment affected by the modification, stretching or rebarrelling must conform with requirements of the specification in effect at the time of such work. In addition, the modification, stretching or rebarrelling must be performed such that the cargo tank, as modified, stretched or rebarrelled, meets the applicable structural integrity requirements (§ 178.337–3, § 178.338–3, or § 178.345–3 of this subchapter) of the specification in effect at the time of such work. The work must conform to the requirements of the applicable specification as follows:

(i) For specification MC 300, MC 301, MC 302, MC 303, MC 305 and MC 306 cargo tanks, the provisions of either specification MC 306 or DOT 406 until August 31, 1993 and, thereafter to specification DOT 406 only;

(ii) For specification MC 304 and MC 307 cargo tanks, the provisions of either specification MC 307 or DOT 407 until August 31, 1993 and, thereafter to specification DOT 407 only;

(iii) For specification MC 310, MC 311, and MC 312 cargo tanks, the provisions of either specification MC 312 or DOT 412 until August 31, 1993 and, thereafter to specification DOT 412 only; and

(iv) For specification MC 330 cargo tanks, the provisions of specification MC 331.

(4) The person performing the modification, stretching, or rebarrelling must:

(i) Have knowledge of the original design concept, particularly with respect to structural design analysis, material and welding procedures;

(ii) Assure compliance with the rebuilt cargo tank's structural integrity, venting, and accident damage protection requirements;

(iii) Assure compliance with all applicable Federal Motor Carrier Safety Regulations for any newly installed safety equipment;

(iv) Pressure retest each cargo tank in accordance with applicable specification;

(v) Change the existing specification plate to reflect the cargo tank as modified, stretched, or rebarrelled, attach a supplemental specification plate noting appropriate changes that have been made to the cargo tank, or remove the existing specification plate and attach a new specification plate to the cargo tank; and

(vi) On a variable specification cargo tank, install a supplemental or new variable specification plate.

(5) The design of the modified or stretched cargo tank must be certified by a Design Certifying Engineer registered in accordance with subpart F of part 107 of subchapter B of this chapter. The Design Certifying Engineer must certify that the modified or stretched cargo tank meets the structural integrity requirements of the applicable specification. The person performing the modifying, stretching or rebarrelling and a Registered Inspector must certify that the cargo tank is in accordance with this section and the applicable specification by issuing a supplemental manufacturer's certificate. The registration number of the Registered Inspector must be entered on the certificate. A 100 percent rebarrelled cargo tank must be designed, constructed, and certified in accordance

with a current cargo tank specification in part 178 of this subchapter.

(6) If the mounting of the cargo tank on the cargo tank motor vehicle involves welding on the cargo tank vessel, then the mounting must be performed as follows:

(i) Non-ASME Code stamped cargo tanks. For a non-ASME Code stamped cargo tank—

(A) By a cargo tank manufacturer holding an ASME "U" stamp and registered with DOT and under the direction of a Design Certifying Engineer; or

(B) By a repair facility holding an ASME "U" stamp or a National Board "R" stamp, registered with DOT and under the direction of a Design Certifying Engineer.

(ii) *ASME Code stamped cargo tank.* For an ASME Code stamped cargo tank, by a repair facility holding a National Board "R" stamp, registered with DOT, and under the direction of a Design Certifying Engineer.

(7) If the mounting of a cargo tank on a cargo tank motor vehicle does not involve welding on the cargo tank wall, then the mounting shall be in accordance with the original specification or with the specification in effect at the time of the mounting.

(8) Prior to any modification, stretching, or rebarrelling a cargo tank must be emptied of any hazardous material lading. Cargo tanks containing flammable or toxic lading must be purged.

(9) After June 30, 1992 any modification, stretching, or rebarrelling on the cargo tank involving welding on the shell or head must be certified by a Registered Inspector. Any repair of an ASME Code "U" stamped cargo tank must be in accordance with the National Board Inspection Code.

(10) The suitability of modification, stretching, or rebarrelling affecting the structural integrity of the cargo tank must be determined by testing as prescribed for new manufacture in the applicable specification.

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Alan I. Roberts,

Associate Administrator for Hazardous Materials Safety.

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