

DEPARTMENT OF TRANSPORTATION HAZARDOUS MATERIALS REGULATIONS BOARD

WASHINGTON, D.C. 20590

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Chapter I—Hazardous Materials Regulations Board, Department of Transportation

[Docket No. HM-57, Amdts. 171-14, 172-14, 173-14, 173-61, 174-14, 175-7, 177-21]

CLASSIFICATION OF CORROSIVE HAZARDS

The purpose of this amendment to the Hazardous Materials Regulations is to amend § 173.240 to provide a quantitative definition for corrosive materials and to change several sections of the regulations now applicable only to acids and other corrosive liquids to make them applicable to shipments of corrosive solids.

On June 11, 1971, the Hazardous Materials Regulations Board published a notice of proposed rule making, Docket No. HM-57; Notice No. 71-17 (36 F.R. 11304), which proposed this amendment. This notice was amended by a supplemental notice in the same docket published on August 18, 1971 (36 F.R. 15762). Interested persons were invited to give their views and many comments were received by the Board.

The very large majority of the comments were directed to the criteria in the definition for corrosive materials and to the proposal to include regulatory controls on shipments of corrosive solids.

Several persons objected to the proposed 8-hour duration period for the skin. contact test. After reviewing the various arguments presented, mostly for a shorter duration period, the Board agrees that 8 hours duration is too lengthy an exposure to be reasonably related to transportation conditions. On the other hand, the Board believes that a 1-hour test as proposed by some commenters, although supportable in some aspects of actual expected exposure, would not provide a sufficient safety factor to account for variations in test conditions or the transportation environment. A few commenters claimed that the proposed test procedure would distort the results by the requirement for an impervious occlusion of the test material on the skin of a rabbit, thereby preventing evaporation of any volatile solvents. Upon review of the procedure, however, the Board finds that this claim is not correct. Impervious occlusion of the test material is not required. The test patches are held in position in such a manner that evaporation of the solvent may be retarded, but it is not prevented. Therefore, the Board concludes that a 4-hour exposure time, using the rabbit test as described in 21 CFR 191.11, is necessary.

The other area significantly commented upon was the proposed corrosion

rate of 0.050 inch per year (IPY) on steel aluminum. Commenters demonstrated that this portion of the proposed definition would result in the regulation of many commodities that are not regulated at present which do not present hazards that require regulations in the transportation environment. After careful consideration, the Board concludes that the corrosion rate proposed was too stringent. Therefore, the Board has decided to specify a corrosion rate criterion in excess of 0.250 inch per year (IPY) on a specific steel and aluminum. Also, under the same evaluation parameters, the Board concluded that dry materials could be adequately regulated by referring only to the contact hazard of the solid on skin. Using a solution for testing and the resultant data for classifying solids would result in the regulation of materials that do not have a significant hazard in transportation. Therefore, the Board has prescribed testing only for the material in the "as shipped" condition. Also, solids are not required to be evaluated in solution for skin contact, and are not required to be evaluated for compatibility with materials of construction for other than the packaging material as now prescribed under section 173.24, or under more specific sections of the regulations.

The Board received comments requesting that a qualifying term be added to the basic definition to cover those circumstances where animal testing does not significantly represent the results of human exposure. The Board agrees with this observation and has added a qualifying statement.

General observations and editorial suggestions were made on the applicability of §§ 173.245b, 173.286 (b) and (c), and 174.597(a). The Board has incorporated many of the suggested changes as improvements in language or safety and within its intent in this docket.

Although the Board proposed multi-wall paper bags that would have to be tested by six drops, the Board agrees with several comments received that the current standard four-drop test should continue to be used for basic guidance in bag evaluation. The Board realizes that on the basis of studies now being conducted, this reference point may undergo change. But in line with its basic approach not to radically change packaging standards for corrosive solids, and to maintain a satisfactory packaging level; the Board has specified four 4-foot drops for bagged corrosive materials.

Objections were raised regarding compatibility requirements for corrosive solids with other hazardous materials as covered by §§ 174.538 and 177.848. The Board agrees that standards of compatibility for solids should be more closely evaluated for possible differences from

corrosive liquid loading and storage standards. Applying the same standards could very likely result in overregulation. Therefore, the Board is not making any South, Houston, TX 77027. change with respect to solids in these two sections of the regulations at this time.

A comment was made as to the correct classification for solid uranium hexafluoride. Future rule making will consider the problem of dual classifications. Meanwhile, present requirements for the packaging of this commodity are prescribed under the radioactive materials classification. However, as specified in §§ 173.2 and 173.402(a) (15) herein, both classifications and their appropriate label requirements apply.

Accordingly, 49 CFR Parts 171, 172, 173, 174, 175, and 177 are amended as

PART 171—GENERAL INFORMATION AND REGULATIONS

In § 171.7, paragraph (c) (13) is added to read as follows:

§ 171.7 Matter incorporated by refer-

(c) * * *

Article

Classed as-

Exemptions and packaging (see sec.)

Label required if not exempt

Maximum quantity in one outside container by rail express.

Prisorr

PART 173-SHIPPERS

(A) In Part 173 Table of Contents, §§ 173.240, 173.242, 173.244, 173.245, and 173.407 are amended; § 173.245b is added to read as follows: Sec.

173.240 Corrosive materials; definition. 173.242 Bottles containing corrosive liq-173.244

Exemptions for corrosive materials. 173.245 Corrosive liquids not specifically provided for.

173.245b Corrosive solids not specifically provided for. 173.407 Corrosive materials.

(B) In § 173.25, paragraph (a) is amended to read as follows:

§ 173.25 Specification containers in outside containers.

(a) Outside specification shipping containers containing no corrosive liquids may be shipped when tightly packed in strong outside fiberboard boxes or drums, wooden boxes, barrels or crates, metal barrels or drums, or other enclosures. The outside shipping container must be narked with the prescribed name of ontents and labeled as required. Packges required by the regulations in this art to be marked "THIS SIDE UP" or THIS END UP" must be packed in the utside package with their filling holes and the outside package must be 1 "THIS SIDE UP" or "THIS END The outside container must also

TAINING THE SHIPPING NAME OR DESCRIPTION OF ALL ARTICLES SUBJECT TO PARTS 170-189 OF THIS CHAPTER (A) In § 172.4(a), "Cor. L.—Corrosive Liquid" is deleted and the following is inserted in place thereof:

MATERIALS

172-COMMODITY

§ 172.4 Explanation of signs and abbre-

(a) * * *

PART

Cor.—Corrosive material.

HAZARDOUS

(B) In § 172.5(a), all "Cor. L." entries in the column "Classed as" are changed to read "Cor."; All "White" entries in the column 'Label required if not exempt' are changed to read "Corrosive"; the commodity list is further amended as follows:

§ 172.5 List of hazardous materials. (a) * * *

be marked "INSIDE PACKAGES COM-PLY WITH PRESCRIBED SPECIFICA-TIONS" unless the specification markings on the inside packages are visible through openings in the outside package.

§ 173.29, paragraph amended to read as follows:

§ 173.29 Empty containers.

(d) Empty bottles other than carboys previously used for the shipment of corrosive liquids must be securely stoppered.

The heading of Subpart E is amended to read as follows:

Subpart E—Corrosive Materials: Definition and Preparation

Section 173.240 is amended to read as follows:

§ 173.240 Corrosive materials; defini-

(a) For the purpose of Parts 170–189 of this chapter, a corrosive material is struction or irreversible alterations in human skin tissue at the site of contact, or in the case of leakage from its packaging, a liquid that has a severe corrosion rate on other materials such as steel and aluminum.

(1) A material is considered to be destructive or to cause irreversible altera-

(13) NACE: National Association of Corrosion Engineers, 2400 West Loop tion in human skin tissue if when tes on the intact skin of the albino rabbi the technique described in Title Code of Federal Regulations, § 191.11, the structure of the tissue at the site of contact is destroyed or changed irreversibly after an exposure period of 4

(2) A liquid is considered to have a severe corrosion rate if its corrosion rate exceeds 0.250 inch per year (IPY) on steel (SAE 1020) or aluminum (nonclad 7075-T6) at a test temperature of 130° F. An acceptable test is described in NACE Standard TM-01-69.

(b) If human experience or other data indicate that the hazard of a material is greater or less than indicated by the results of the tests specified in paragraph (a) of this section, the Department may revise its classification or make the material subject to the requirements of Parts 170–189 of this

(F) In § 173.241, the introductory text of paragraph (a) and paragraph (a) (4) are amended to read as follows:

(a) Outage for containers of corrosive liquids for transportation by carriers by rail freight, rail express, highway, or water, must be as follows:

(4) Outage requirements for tanks or portable tanks. No cargo tank portable tank, or compartment thereof, used for the transportation any corrosive liquid shall be complet filled. The outage for cargo tanks a. portable tanks must be no less than 2

(G) Section 173.242 is amended to read as follows:

§ 173.242 Bottles containing corrosive liquids.

(a) Bottles containing corrosive liquids, as defined by § 173.240, may not be packed in the same outside container with any other article, except as specifically provided in paragraphs (b) and (c) of this section and §§ 173.25, 173.257, 173.258, 173.259, 173.260, 173.261, or

(b) Bottles containing corrosive liquids cushioned by incombustible absorbent material and securely packed in tightly closed metal containers, except hydrofluoric acid which must be packed in a container other than a metal container, may be packed with other articles. This exception does not apply to nitric acid exceeding 40 percent concentration, perchloric acid, hydrogen peroxide exceeding 52 percent strength by weight, nitrohydrochloric acid, or nitrohydrochloric acid diluted, which must not be A liquid or solid that causes visible de- with any other article under any cir-

(c) Corrosive liquid solutions in securely closed bottles, in quantities necessary for preparing photographic processing mixtures and efficiently cushioned. may be packed in the same outside ship ping container with required amounts packaged dry chemicals not classed a.

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(c) is

§ 173. which dicate in § 1 tles ha 16 ow metal unless exemr marki cept t outsid

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§ 173.:

(a) § 173.2 special must tainer not rea posed as foll

(J)as foll § 173.:

(a)

§ 173.2 special must comply

aterias by these regulations, dangerous reaction would the contents of bottles be the dry chemicals. Marking § 173.401(c) is not required.

173.244, the heading and i) are amended; paragraph o read as follows:

xemptions for corrosive ma-

ve liquids, except those for mptions are provided as in-"No exemption" statement this chapter, in inside botapacity not over 1 pound or volume each inclosed in a the outside container are, ise provided in this part, specification packaging, labeling requirements, exking name of contents on ner is required for shiprier by water. Shipments tion by highway carriers so from Part 177 of this t § 177.817.

e solids, except those for ptions are provided as in-'No exemption" statement this chapter, in inside lass, or paper receptacles n 5 pounds capacity each,

rid fiber, or composiof not more than J each, in metal, board outside containers 5 pounds net weight each erwise provided in this om specification packagnd labeling requirements, rking name of contents iner is required for shiper by water. Shipments on by highway carriers from Part 177 of this § 177.817.

45, the heading and the t of paragraph (a) are l as follows:

osive liquids not specified for.

liquids, as defined in than those for which nents are prescribed, in specification coned of materials that will ously with or be decomemical packed therein,

3.245b is added to read

osive solids not specifil for

solids, as defined in than those for which r. containers fully

.24, as follows: al, or fiberboard box more than 10 pounds net weight capacity each.

(2) Fiberboard box with one inside paper bag of not; over 50 pounds net; weight capacity.

(3) Fiberboard box with one inside plastic bag of not over 120 pounds net weight capacity.

(4) Metal drum not over 55-gallon capacity.

(5) Fiber drum not exceeding 550 pounds net weight and not over 55-gallon capacity.

(6) Plastic drum or pail not exceeding 80 pounds net weight and not over 6-

gallon capacity.

(7) Multiwall paper bag not exceeding 110 pounds net weight, and of at least 4-ply construction including moisture-barrier ply. Completed package, filled to weight with product and closed for shipment, must be capable of withstanding four drops from a height of 4 feet onto a solid surface, one drop on each end and one drop on each face, without sifting or rupture.

(8) Burlap bag with inside plastic liner, made of not less than 7½ ounce other materials in the kit. burlap not exceeding 110 pounds net weight capacity. Completed package, filled to weight with product and closed for shipment, must be capable of withstanding four drops from a height of 4 feet onto a solid surface, one drop on each end and one drop on each face, without sifting or rupture.

(9) Plastic bag not exceeding 110 pounds net weight capacity. Completed package, filled to weight with product and closed for shipment, must be capable of withstanding four drops from a height of 4 feet onto a solid surface, one drop on each end and one drop on each face, without sifting or rupture.

(10) Metal portable tank of not over 660-gallon capacity and 7,000 pounds gross weight.

(11) Metal sift-proof cargo tanks, tank cars, or hopper-type or pneumatic bulk vehicles.

(K) In § 173.257, paragraph (c) is amended to read as follows:

§ 173.257 Electrolyte (acid) or corrosive battery fluid.

(c) Electrolyte acid or corrosive battery fluid contained in polyethylene containers not over 2 quarts capacity each and packaged not more than three containers in specification 15A, 15B, 15C, 16A, or 19A wooden boxes (§§ 178.168, 178.169, 178.170, 178.185, 178.190 of this chapter), or packaged as prescribed in paragraph (a) (6) of this section, and bearing a corrosive label, may be securely attached to self-propelled vehicles or mobile agricultural machinery, or securely braced on a railcar floor.

nts are prescribed, (L) In § 173.286, paragraphs (a) and (b), and the introductory text of paragraph (c) are amended to read as follows:

ide containers which § 173.286 Chemical kits.

are, glass, metal, plas- (a) Chemical kits, except as other-

chapter, must be packed, marked, and labeled as prescribed by this part for the specific corrosive materials contained therein.

(b) Chemical kits containing corrosive liquids in inside containers not exceeding 6 fluid ounces capacity each and complying with all of the following requirements, are exempt from specification packaging, marking, other than name of contents, and labeling requirements. Shipments for transportation by highway carriers are exempt also from Part 177 of this chapter, except § 177.817.

(1) The kit may not contain any corrosive liquid for which no exemption from packaging requirements of this Part 173 is permitted by the commodity list in § 172.5(a) of this chapter.

(2) The kit must be a strong wooden or metal container, or must be packed in a strong wooden or metal container.

(3) The corrosive liquids must be cushioned with sufficient absorbent cushioning material to completely absorb the contents of the individual containers, and must be protected from injury by

(4) The contents of the kit must be of a nature and packed so there will be no possibility of the mixture of contents causing dangerous evolution of heat or

(c) Chemical kits containing corrosive liquids and other chemicals not classed as hazardous materials used for photographic processing, except as otherwise provided for in Parts 170–189 of this chapter, must be packed in specification containers as follows:

(M) In § 173.399, paragraph (b) (2) is amended to read as follows:

§ 173.399 Labeling of packages of radioactive materials.

(b) * * *

(2) Packages containing nitric acid solutions of radioactive materials must bear both a "RADIOACTIVE" label and a "CORROSIVE" label.

(N) In § 173.401, the introductory text of paragraph (a) is amended to read as follows:

§ 173.401 Hazardous materials.

(a) Packages containing flammable liquids, flammable solids, oxidizing materials, corrosive materials, compressed gases, and poisons, as defined in this part, must be marked, unless exempted, with the proper shipping name as shown in the commodity list (see § 172.5 of this chapter). For tank cars this marking must appear either on the placards or commodity cards.

(O) In § 173.402, paragraphs (a) (3) and (15) are amended to read as fol-

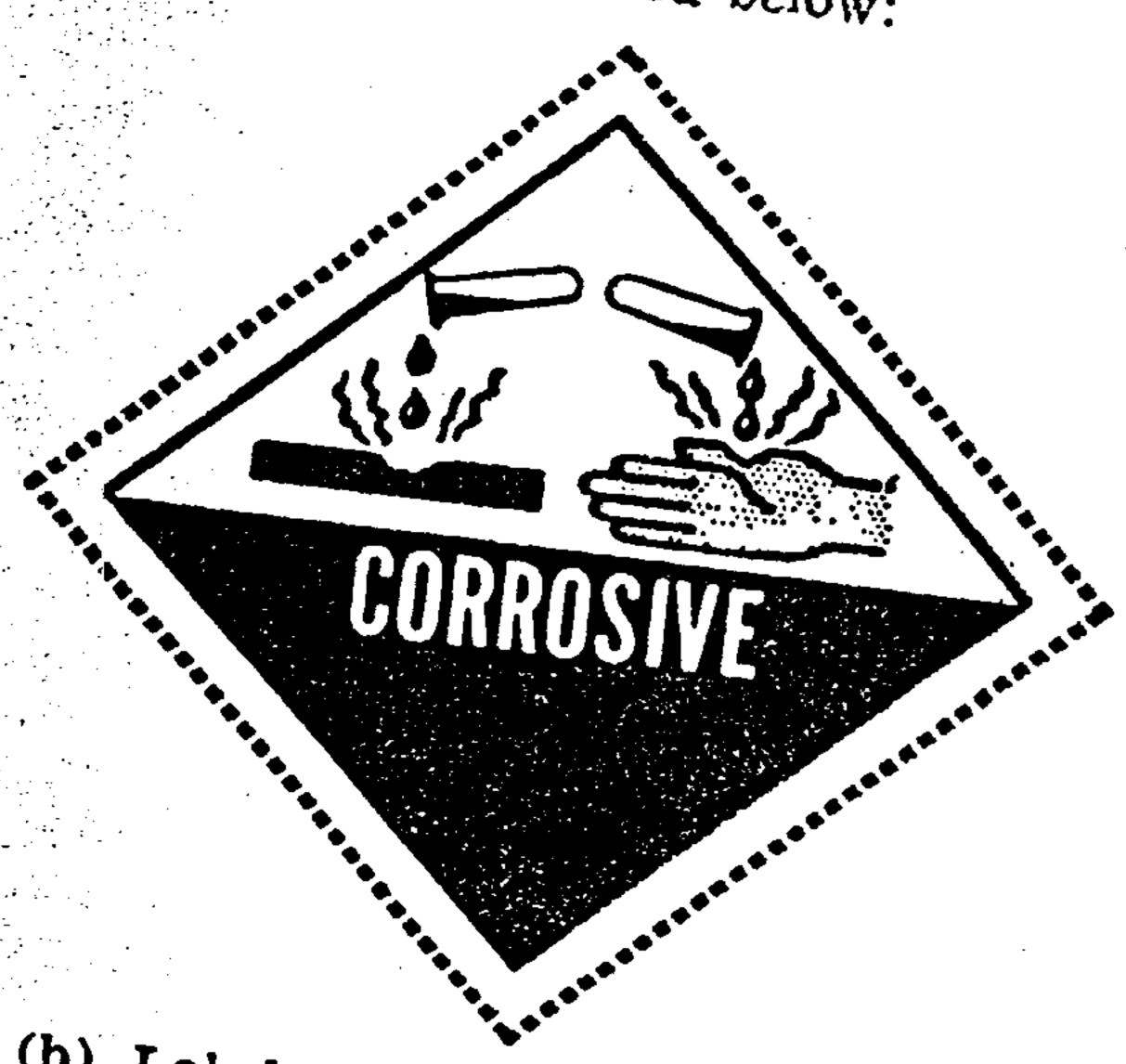
§ 173.402 Labeling of hazardous materials.

(a) * * *

nposition board of not wise provided in Parts 170–189 of this \$ 173.407(a) on packages of corrosive

materials, except when exempted from the labeling requirements by other regulations in this part.

- (15) Packages containing materials which are either Class A poisons or l'adioactive materials, and are also flammable (gases, liquids, or solids), corrosive materials, class B poisons, oxidizing materials, or compressed gases, must also bear additional labels showing those other hazardous characteristics (see also
- (P) In § 173.407, the heading, the introductory text of paragraph (a) and paragraph (b) are amended to read as
- § 173.407 Corrosive materials labels.
- (a) Labels for packages of corrosive materials must be diamond shape (10 cm.), measuring 4 inches on each side, white on the top half and black on the bottom half. Printing of the symbol on the top half must be in black inside of a black line border. Printing on the bottom half must be in white. Printing must be inside of a black border line 1/4 inch (6 mm.) inside the edge and parallel to the edge as illustrated below:



(b) Labels for packages of corrosive materials shipped by air must be as follows: (White and black with black printing on white, as described paragraph (a) of this section).



PART 174—CARRIERS BY RAIL FREIGHT

(A) In Part 174, Table of Contents, § 174.597 is amended to read as follows:

174.597 Leaking packages of corrosive mate-

- (B) In § 174.532, paragraph (c) and the introductory text of paragraph (h) are amended to read as follows:
- § 174.532 Loading other hazardous ma-
- (c) Packages bearing labels must be loaded so they cannot fall and other packages cannot fall onto or slide against them. This requirement does not preclude the use of loading methods that are designed to permit limited movement of the load and that are approved in writing by the Federal Railroad Administrator. Packages bearing markings "This Side Up" or "This End Up" must be so loaded. Hazardous materials for which red, yellow, green, or corrosive labels (liquids only) are prescribed herein must not be loaded in the same car with explosives named in §§ 173.53 to 173.87 of this chapter. (See loading and storage chart § 174.538.) Packages bearing yellow labels must not be loaded in the same end of a car with packages bearing corrosive labels (liquids only), except that shippers loading carload shipments who have obtained prior approval from the Department, may load these articles together when it is known that the mixture of contents would not cause a dangerous evolution of heat or

(h) Corrosive liquids: Carboys of corrosive liquids must not be loaded into container cars. They must be so blocked, braced, or stayed that they cannot change position during transit when being handled with reasonable care. Carboys of nitric acid must not be loaded into box cars or in truck bodies or trailers on flat cars more than two tiers high, except that completely boxed carboys, specification 1D (§ 178.4 of this chapter), may be loaded three tiers high. Car doors may be cleated in an open position if desired. Flat or stock cars may be used for loading carboys of acids.

(C) In § 174.541, paragraphs (a) (1) and (3) are amended to read as follows:

§ 174.541 "Dangerous" placards; "Dangerous-Radioactive material" placards; or "Caution—Residual phos-(a)

(1) Cars containing one packages bearing red, yellow, corrosive (liquids only), or poison labels, as prescribed by §§ 173.405 to 173.408 and 173.409(a) (2) of this chapter.

(3) Tank cars containing flammable liquids, flammable solids, oxidizing materials, corrosive liquids, poisonous liquids or solids, class B, flammable compressed nonflammable compressed

(D) In § 174.584 paragraph table is amended as follows: § 174.584 Waybills, switching orders, or

(a) * * *

Label notation to follow

entry of the article on the entry of the article on the Placard notation to follow be 's" high and appear on

the billing near the space provided for the car number

For corrosive liquids_____ Corrosive____ "Dangerous Placard"____ "Dangerous". For eorrosive solids______None____None.

(E) In § 174.586, paragraph amended to read as follows:

(change)

§ 174.586 Handling hazardous materials.

(g) Corrosive liquid carboys should be handled so as not to spill the contents. "Empty" carboys, so called, should be handled with necks up, and with sufficient care to prevent burns to clothing or person from leaking corrosive liquid.

§ 174.597, the heading and paragraph (a) are amended to read as

§ 174.597 Leaking packages of corrosive

(a) Whenever a car "Dangerous" placard is discovered in

transit with packages in leaking condition, all unnecessary movement of the car must cease and at the first opportunity an examination must be made of the lading, and if practicable any broken or leaking packages of nitric or mixed acids should be removed promptly to prevent fire. Any corrosive liquid remaining on the car floor or on surrounding packages should be washed away with a plentiful supply of water, or if not available, cleaned up with a liberal application of sand or earth. Care should be exer cised to prevent inhalation of gases liberated through the application of water; when employees are injured by corrosive material, the material should be washed off immediately by a liberalnion. application of water.

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75-CARRIERS BY RAIL EXPRESS

rotection of packages.

's shall prevent contact of ackages bearing yellow or els with combustible subas sawclust, shavings, or it may be present in exspace should be swept or

HIPMENTS MADE BY OMMON, CONTRACT, CARRIERS BY PUBLIC

177. Table of Contents, nded to read as follows:

; corrosive materials.

14, paragraphs (a) and to read as follows:

Tuirements.

ed in vehicle. Any cylinder, not deaniently attached to a taining any flammable gas, corrosive maarticle, must be reainst movement within by which it is being

ive motion between lers of explosives, flammable solids, corrosive materials, id poisor liquids braced as to preelative to the vehicle liner's having valves t be so loaded that imum likelihood of g transportation.

paragraph (b) is llows:

(b) Carboys and frangible tainers. In general, individual carboys and frangible containers of corrosive liquids, including charged electric storage batteries, must, when loaded by hand, be individually loaded into and unloaded from any motor vehicle in which they are to be, or have been, transported. All reasonable precautions must be taken to prevent, by all practicable means, the dropping of any such containers or batteries containing corrosive liquids. No such container or battery may be loaded into a motor vehicle having an uneven floor surface. It shall be permissible to load on or transport in any motor vehicle any authorized carboys or frangible shipping containers, containing corrosive liquids, more than one tier high above any floor only if such carboys or other containers are boxed or crated, or are in barrels or kegs, as required by Parts 170-189 of this chapter, and only if such containers are so stacked that the weight of each tier above the first is entirely supported by the boxes, crates, barrels, kegs, or other authorized means of enclosing the carboys or frangible containers. Only so many tiers as may adequately be so supported without danger of crushing or breaking, shall be permitted. Means must be provided to prevent by all practicable means, in all cases, the shifting of containers or batteries during transit. Nothing contained in this section shall be so construed as to prevent the use of cleats or other retaining means for the purpose of preventing shifting of containers or batteries. For the purposes of this section

U.S.C. 1657; title VI and sec. 902(h), Federal motor vehicle, shall be deemed to be a floor. (For recommendations for handling leaking or broken packages, see § 177.858

(D) In § 177.854, the introductory text of paragraph (f) is amended to read as

§ 177.854 Disabled vehicles and broken or leaking packages; repairs.

(f) Stopped vehicles; other dangerous articles. Whenever any motor vehicle transporting flammable liquids,

corrosive materials, compressed gases; or poisons, is stopped for any cause other than necessary traffic stops upon the traveled portion of any highway, or a shoulder next thereto, the following requirements shall be complied with during the period of such stop:

(E) In § 177.858, the heading and paragraph (a) are amended to read as

§ 177.858 Accidents; corrosive mate-

(a) Accident to vehicle; other lading damaged; vehicle washed. In the event of any accident involving any motor vehicle transporting corrosive materials in which has been involved the breakage, spillage, or leakage of containers of such materials, care shall be exercised in the handling of any other lading which may have become damaged thereby so as to minimize the hazard in handling such damaged lading during the unloading process. The interior or any other parts of the motor vehicle upon which a corrosive liquid may have become spilled shall be thoroughly washed with water as soon after the unloading process as feasible and prior, in any event, to the subsequent reloading of the motor vehicle. (See also § 177.814.)

This amendment is effective December 31, 1972, however, compliance with the regulations as amended herein is authorized on October 1, 1972.

Aviation Act of 1968, 49 U.S.C. 1421-1430 and

Issued Washington, March 17, 1972.

JAMES F. RUDOLPH, Board member for the Federal Aviation Administration.

ROBERT A. KAYE, Board member for the Federal Highway Administration.

MAC E. ROGERS, Board member for the Federal Railroad Administration. [FR Doc.72-4370 Filed 3-22-72;8:48 am]