U.S. Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

APR 13 2004

Captain Sam Rogers
Chief, Liner Activities
National Cargo Bureau, Inc.
17 Battery Place
Suite 1232
New York, NY 10004

Ref. No. 04-0050

Dear Captain Rogers:

This is in response to your March 8, 2004 letter requesting further clarification of our letter to you dated February 24, 2004 concerning requirements of the Hazardous Materials Regulations (HMR;49 CFR 171-180) applicable to calcium hypochlorite, hydrated.

You ask whether our February 24, 2004 letter was written in the context of the current regulations. It was written with the understanding that the regulatory requirements applicable to calcium hypochlorite, hydrated, UN 2880, and the provisions of §171.21(f) are the same in the current regulations (i.e., the 2003 edition of the HMR, revised as of October 1, 2003) as they were in the 1998 edition of the HMR. As you correctly pointed out in our meeting of March 5, 2004, there was a change to the requirements for stowage aboard vessel which occurred between the 1998 and 2003 editions. However, I note this does not change the substance of our response.

With regard to the 1998 HMR, Calcium hypochlorite, hydrated, UN 2880, was not forbidden under § 173.21 because the material is not likely to decompose under normal conditions of transport when shipped in accordance with applicable regulatory requirements. Further, under the 1998 HMR, calcium hypochlorite, hydrated, UN 2880, was not subject to the controlled temperature provisions of § 173.21(f). Similarly, calcium hypochlorite, hydrated, UN 2880, was not a prohibited material or subject to temperature control requirements under the provisions of the International Maritime Dangerous Goods (IMDG) Code in effect in 1998. Under both the HMR and the IMDG Code, calcium hypochlorite, hydrated, UN 2880, was, and continues to be subject to stowage provisions that require it to be stowed away from heat. In 1998, that requirement was: Stow "away from" sources of heat where temperatures in excess of 55° C (131° F) for a period of 24 hours or more will be encountered. The stowage requirement was amended in 2001, in a final rule adopted under Docket No. HM-215D (June 21, 2001; 66 FR 33316), for consistency with revised IMDG Code stowage requirements. The current requirement states: Stow "away from" sources of heat.

You also ask that we confirm "that when packages are selected for hazardous commodities, when the shipper has, or should have, knowledge that the package size selected may adversely contribute to the commodities stability - that the shipper is required to determine if the commodity meets SADT criteria, regardless of whether the package is generally authorized by the regulations." With regard to calcium hypochlorite, hydrated, UN 2880, your understanding is incorrect. As discussed above and at our meeting, when transported in accordance with applicable HMR requirements, including the quantities and packages specified in the HMR, calcium hypochlorite, hydrated, is not likely to decompose under normal conditions of transport and is not subject to the provisions of § 173.21(f).

At our meeting I mentioned the May 22, 1980 final rule that put the provisions of § 173.21(b), [proposed as § 173.21(a)(2) and now § 173.21(f)], in place (pertinent pages enclosed). Of particular interest is the preamble discussion by the Materials Transportation Bureau ("MTB"; the predecessor agency of the Research and Special Programs Administration) on page 34570, which reads in part:

> The fact that an organic peroxide, or any other material, decomposes below 130° F. does not necessarily mean that it must be stabilized or refrigerated. The paragraph states in part "with an evolution of a dangerous quantity of heat or gas...." If the decomposition or polymerization does not create a hazard in transportation, the provisions of the paragraph do not apply regardless of the decomposition temperature of the material.

I hope this information is helpful.

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Director, Office of Hazardous
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cc: Gordon W. Rousseau

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DEPARTMENT OF TRANSPORTATION

Research and Special Programs Administration

49 CFR Parts 171, 172, 173, 174, 176, 177

[Docket Nos. HM-118, 126A, 126B, 145A, 145B, 159, and 171; Amdt. Nos. 171-53, 172-58, 173-137, 174-37, 176-11, 177-48]

Identification Numbers, Hazardous Wastes, Hazardous Substances, International Descriptions, Improved Descriptions, Forbidden Materials, and Organic Peroxides

AGENCY: Materials Transportation Bureau (MTB), Research and Special Programs Administration, Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The purpose of this final rule is to accomplish the following: (1) adopt a numerical identification system for hazardous materials transported in commerce; (2) adopt regulations pertaining to the transportation of hazardous wastes; (3) adopt regulations pertaining to the identification of, and discharge notifications for, hazardous substances; (4) list certain forbidden materials by name and revise the general criteria applicable to forbidden materials; (5) provide proper shipping names for organic peroxides; (6) require inclusion on shipping papers of the technical names of certain hazardous components of materials covered by n.o.s. entries; and (7) provide for the optional use of certain United Nations shipping descriptions. The principal objective of this rule, as it pertains to the use of the identification numbers, is to improve the capabilities of emergency response personnel, such as firemen and policemen, to quickly identify hazardous materials and to assure the accurate transmission of information to and from the scenes of accidents involving hazardous materials.

EFFECTIVE DATE: November 20, 1980, unless otherwise specified in the regulations adopted under this rulemaking. Shipments may be prepared, offered for transportation, and transported in accordance with these amendments beginning July 1, 1980.

FOR FURTHER INFORMATION CONTACT: L. Metcalfe (202-426-0656) or Delmer Billings (202-426-2075), Standards Division, Office of Hazardous Materials Regulation, Materials Transportation Bureau, Department of Transportation, Washington, D.C. 20590. Office hours are 8 a.m. to 4:30 p.m. Eastern Time, Monday through Friday.

SUPPLEMENTARY INFORMATION: This action by the Materials Transportation Bureau (MTB) consolidates several related rulemakings into one final rule. By "related", MTB means that in many instances, the same sections of the Hazardous Materials Regulations are affected by the different rulemakings covered by this final rule. The notices of rulemakings containing the proposals, identified by docket number, Federal Register publication, date of publication and title are as follows:

1. Docket HM-118, Notice No. 74-9 (39 FR 25235, July 9, 1974), Expanded Polystyrene Resin and the Definition of a Flammable Solid.

2. Docket HM-145A, Notice No. 78-6 (43 FR 22626, May 25, 1978), Transportation of Hazardous Waste Materials.

3. Docket HM-145B, Notice No. 79-2 (44 FR 10676, February 22, 1979), Transportation of Hazardous Substances.

4. Docket HM-126A, Notice No. 79-9 (44 FR 32972, June 7, 1979), Display of Hazardous Materials Identification Numbers; Improved Emergency Response Capability.

5. Docket HM-126A (additional proposal), Notice No. 79-9 (44 FR 43859, July 26, 1979), Descriptions for Organic Peroxides.

6. Docket HM-159, Notice No. 79-12 (44 FR 43861, July 26, 1979), Forbidden Materials.

7. Docket HM-171, Notice No. 79-11 (44 FR 43864, July 26, 1979), Use of United Nations Shipping Descriptions.

8. Docket HM-126B, Notice No. 79-14 (44 FR 65020, November 8, 1979), Improved Descriptions of Hazardous Materials for Emergency Response.

This consolidated publication of final regulations pertaining to the subjects covered by the dockets identified above was requested by many commenters responding to the different proposals. MTB agrees that all the referenced proposals should be acted upon in one body of final regulations so that persons affected by these new and revised regulations may plan their future business activities relative to training, development and acquisition of shipping documents, the marking of packages, and the development of procedures to comply with the revised incident reporting and newly adopted identification requirements. However, MTB is not able to be fully responsive to those commenters who requested that all of the amendments covered by this action be made effective on the same date (in several comments, the date suggested was two to three years from the date of publication of final regulations). With the exception of regulations pertaining to hazardous wastes, hazardous substances, empty packagings, and certain organic peroxides, more than one year is being provided for the implementation of procedures to comply with the requirements adopted in this action; in fact approximately three years is being provided for compliance with the packaging marking requirements. Instead of specifying a set of lengthy and complicated effective dates in this preamble, the effective date for compliance with each regulation that is effective after November 20, 1980, is set forth in a specific regulation associated with each new or revised requirement. Sections containing compliance dates after November 20, 1980, are § 172.101 (j) and (k); § 172.200(c); § 172.203(k); § 172.300(c)(3); § 172.324(b); § 172.336(c)(6) and (7); and § 172.402(a)(10). The principal requirements that become effective on November 20, 1980 (with certain exceptions) pertain to the transportation of hazardous wastes, hazardous substances, certain forbidden materials (organic peroxides), and empty packagings.

Also bearing on the matter of effective dates, is the requirement for compliance by MTB with the Federal Reports Act of 1942 and procedures administered thereunder by the Office of Management and Budget (OMB) relating to prior clearance of recordkeeping requirements imposed by Federal regulatory action. Prior OMB clearance is required with respect to the provisions adopted herein which impose recordkeeping or report preparation requirements.

MTB will inform the public through notification in the Federal Register when OMB clearance of these requirements has been received. It is anticipated that this clearance process will be completed prior to November 20, 1980, the earliest of the effective dates prescribed herein.

It should be noted that most of the materials that this rule indicates by name to be "Forbidden" materials in column 3 of the Table in § 172.101 are and have been "Forbidden" materials in the past under general prohibitions. The listing of these materials by name, and the effective dates specified for these amendments, does not change the present "Forbidden" status of these materials if they were not authorized to be offered for transportation prior to this publication.

Concerning special requirements pertaining to hazardous wastes and hazardous substances, it is important to note that those requirements do not apply unless a material is a hazardous waste or a hazardous substance (or both) according to the definitions in § 171.8. This determination is separate

hazardous substances. This decision also addresses the concern expressed by several commenters concerning the unique display of the letter "E" as was proposed in the Notice.

Many commenters discussed the significant impact of the proposed regulations on consumer commodities expressing the view that, if adopted, the effective use of the ORM–D hazard class would be essentially negated and that the concept of limited quantities would be destroyed. MTB believes that this concern has been overcome by the manner in which it has defined hazardous substances for purposes of application of the hazardous materials regulations.

While the regulations for hazardous substances adopted by DOT in these amendments are closely related to those of the EPA found in 40 CFR Part 117, they are not identical in their applicability. EPA's regulations require, without qualification, notification of discharges of reportable quantities of hazardous substances under conditions specified in § 311(b)(5) of the Clean Water Act and, as specified in the notice, provisions of 40 CFR 117.21. The DOT regulations require notification when a reportable quantity is discharged from a package (e.g., a drum, cargo tank motor vehicle or tank car) that is marked or documented as containing a reportable quantity.

Persons who do not have knowledge that a reportable quantity of a hazardous substance has been discharged are not required by EPA to make notifications. MTB has been advised by EPA that it will not bring civil or criminal suit for failure to make notification when such notification is not required by DOT's regulations, unless it can be shown that there was actual knowledge that a reportable quantity was discharged.

Shippers and carriers must also bear in mind that compliance with the provisions of this rule do not relieve them from possible civil liability under § 311 resulting from discharges of reportable quantities. This liability relates to the discharge itself and removal costs and is addressed in regulations promulgated by the EPA and the U.S. Coast Guard.

HM–159 (HM–118)—Forbidden materials

This rule adds the names of materials to the Hazardous Materials Table that MTB considers to be too hazardous to be permitted in commercial transportation. Also, the rule adds N-methy-N'-nitro-N-nitrosoguanidine as a flammable solid and adds a new § 173.179 prescribing packaging requirements for this material. Changes have been made to §§ 173.21 and 173.51 pertaining to forbidden materials and packaging.

A total of 28 comments were received in response to the Notice. All commenters were in general agreement with the proposal to add certain materials considered to be too hazardous for commercial transportation to the Table. A commenter presented data indicating that 2,6-dichloro-4-nitrophenol is not a forbidden material. MTB agrees with the data presented and this material has been removed from the list. The same commenter also stated that some iodoso compounds might be considered forbidden, but that others would not be in this category. Pending further detailed investigation of these substances, the proposed entry of iodoso and iodoxy compounds (dry) has been removed from the list of named forbidden materials.

A comment from a manufacturer of organic peroxides suggested that the term "active oxygen" would be better than "available oxygen" for those entries in the Table containing such limitations. MTB agrees with the commenter and the term "active oxygen" has been substituted for the term "available oxygen."

Two air carrier associations concurred in the proposed § 172.100(d) and suggested that the idea contained in that section be applied to all commodities in the Table. Based on these comments, MTB has reviewed the entire use and meaning of the asterisk in the Table and has decided to eliminate the asterisk, thus allowing a shipper to determine if a specific material should be regulated under the hazard class identified in the Table. However, in conjunction with this change, it is necessary for MTB to introduce a new symbol into the table in order to identify those materials which have been designated as hazardous materials of a particular class, whether or not they meet the definition for the hazard class in which they have been designated. If a shipper wishes to ship a formulation of a material identified by the plus (+) symbol as non-regulated, or in a class other than that specified in the Table, he must supply the Associate Director, Office of Hazardous Materials Regulation, MTB with data which establishes that it does not present a hazard in transportation, or presents a different hazard than that which is listed in the Table.

Another commenter objected to the limiting of peroxyacetic acid to 40% by weight instead of the 43% authorized in the UN Recommendations and the IMCO regulations. There are several current organic peroxide entries which have different concentration limits in the UN Recommendations and the DOT Hazardous Materials Regulations. Since the concentration limits in the UN Recommendations were agreed to by the U.S. delegations to the UN meetings, MTB has revised the limits in the Table to agree with those in the UN Recommendations.

Several commenters objected to all or parts of the proposed revision of § 173.21. Some organic peroxide manufacturers objected to the use of 130°F. in paragraph (a)(2) because their interpretation was that this temperature is the minimum decomposition temperature for which refrigeration would be required. They argued that they have shipped certain organic peroxides with decomposition temperatures of 120°F. without refrigeration for years and, also, that the UN Recommendations use 122°F. as the decomposition or polymerization temperature below which refrigeration is required for the most active organic peroxides. MTB considers 130°F. the maximum temperature that could be expected during transportation, and there are many sections in the regulations which reference 130°F. The fact that an organic peroxide, or any other material, decomposes below 130°F. does not necessarily mean that it must be stabilized or refrigerated. The paragraph states in part "with an evolution of a dangerous quantity of heat or gas . . . ." If the decomposition or polymerization does not create a hazard in transportation, the provisions of the paragraph do not apply regardless of the decomposition temperature of the material. Therefore, the temperature reference of 130°F. has been maintained in the final rule.

Several commenters objected to the fact that § 173.21(a)(2) did not contain a statement concerning the time a material would have to be exposed to the 130°F. temperature in order to be considered forbidden from transportation. MTB agrees that this is a weakness in the proposed wording and has altered the wording of the rule to reference two test methods. The test methods are: ASTM E–487 "Standard Method of Test for Constant Temperature Stability of Chemical Materials" and the Organic Perioxide Producers' Safety Division (OPPSD) "Self Accelerating Decomposition Test (SADT)." Several commenters expressed concern that this paragraph does not make it clear that approvals issued by the Bureau of Explosives would be continued in effect until an orderly transition to approval by the

Associate Director for Operations and Enforcement, MTB could be accomplished. MTB acknowledges the validity of the objection and has included a clarification statement in the rule which references § 171.19.

Several commenters stated that proposed § 173.21(a)(3) was too vague and it was suggested that a phrase be added such as ". . . .e.g., the release of flammable vapor in such quantities that an explosive mixture would be created within the transport vehicle." MTB agrees with this objection, and wording to the effect of that suggested has been included in the rule.

On July 9, 1974, the Hazardous Materials Regulations Board, the predecessor of MTB, published a Notice a Proposed Rulemaking under Docket No. HM–118 proposing to list and classify polystyrene resin, expandable, containing a flammable liquid or gas, as a flammable solid. No final action was taken on this rulemaking proposal. Section 173.21(a)(3) of this rule will forbid the offering for transportation of packages which evolve a dangerous quantity of flammable gas or vapor from a material not otherwise subject to the regulations. MTB believes this prohibition is sufficient to preclude the type of potential hazard which was the concern addressed by the Hazardous Materials Regulations Board in its proposal under Docket No. HM–118. Therefore, the proposals under Docket No. HM–118 are hereby terminated.

Several commenters said that § 173.21(a)(4) needed clarification. The objections were based on the fact that there was no definition of detonation and that there is no recognized test method for determining whether detonation has occurred in a package as a result of a thermal stimulus. In response to the first objection, MTB has included a definition of detonation in the final rule. The second objection is not correct. There are three tests specified in the regulations for determining whether a packaged material detonates as a result of a thermal stimulus. One of these is described in § 173.86(g), Note 2. Another method is found in DOD TB 700–2 (May 19, 1967) which is referenced in §§ 173.86(b) (2) and (3). Both of these test methods have been in the DOT regulations for many years and have been used extensively on both military and commercial materials to determine whether a detonation will occur in a package exposed to a thermal stimulus. While both test methods were designed for testing propellants, they can be and have been used to test other hazardous materials. The third test method is described in § 173.114a(b)(6) and may be used in evaluating whether a detonation has occurred. MTB has considered it inadvisable to reference these methods in this rule because such a reference could suggest that a chemical manufacturer who is not familiar with testing explosives should attempt to perform these tests. This type of testing should be done only by personnel who are well versed in the testing of explosives and this fact has been stated in the rule.

Docket HM–171—Use of United Nations Shipping Descriptions

The amendments under this Docket authorize the use of United Nations shipping descriptions and identification numbers for certain hazardous materials in place of the descriptions required by existing DOT regulations. These amendments are intended to facilitate the international transportation of hazardous materials and to minimize the economic burdens imposed on shippers by the multiplicity of package markings and shipping paper descriptions now required for compliance with both domestic and international requirements. In addition, the amendments provide optional stowage locations for hazardous materials when transported by vessel. The optional stowage locations authorized are those provided for the particular hazardous materials in the International Maritime Dangerous Goods (IMDG) Code published by the Inter-Governmental Maritime Consultative Organization (IMCO).

A number of comments were received which expressed complete support for the proposal. In general, the supporting commenters endorsed the proposal since it would eliminate costly redundancy in shipping paper descriptions and packaging markings. One supporting comment is quoted since it provides some quantification of the importance of the international transportation of chemicals to our economy:

> Shipments of chemicals and allied products were valued at $126.5 billion in 1978. The export activity continued to be strong in 1978 with the value of all chemical exports totaling $12.62 billion, an increase of 16.7 percent over 1977. While the imports of chemicals also increased, the favorable balance of trade in the chemical area increased from $5.84 billion in 1977 to $6.19 billion in 1978, a gain of 6 percent. In the future, these shipments are expected to increase and will be affected by international regulations to a greater degree.

Several comments were received expressing opposition to the proposal. It should first be noted that many of the issues raised concerned the use of IMCO classifications and labeling for certain hazardous materials. Although limited to import and export shipments in the present regulations, this authorization has been a provision of the DOT regulations since adoption of amendments under Docket No. HM–112 in 1976. For this reason, MTB believes it is reasonable to assume that shipper and carrier personnel should, in the execution of their responsibilities in the preparation and acceptance of shipments, already have gained a basic familiarity regarding the use of IMCO classifications and labels as an alternative to the class and labels prescribed for certain hazardous materials in § 172.101.

The fundamental argument raised in opposition to the proposed amendments is that the existence of an optional hazardous materials list will, in the words of one commenter, have a "chaotic effect" on the regulated industries, particularly on the rail and motor carrier industries, because it would complicate the regulations. MTB agrees that the provision of options to various requirements increases the volume of regulations and, to a certain degree, their complexity. In spite of this fact, experience has shown that such regulatory provisions are essential if the regulations are to be effective without unnecessarily burdening industry. For example, it could be argued that the hazardous materials placarding requirements could be vastly simplified by eliminating the "DANGEROUS" placard and certain exceptions to the placarding requirements, and simply requiring that appropriate placards be displayed for each hazardous materials transported regardless of quantity. Such simplification is obviously not in the best interests of the regulated industries and would undoubtedly be declared totally unacceptable by the very commenters who oppose the amendments under Docket HM–171. MTB believes that these amendments will do much to enhance safety by minimizing redundant, conflicting and confusing shipping paper and package marking requirements. Under the current practice of incorporation of IMCO classification and labeling provisions by reference, it is difficult for rail or motor carrier personnel to determine compliance with these provisions. The optional list will eliminate confusion and errors on the part of carrier personnel by making this information readily available to them in § 172.102.

A number of objections to the proposed amendments were raised on the basis of placarding implications. One commenter expressed concern that rail carrier personnel would be unable

classed as Flammable liquid without an asterisk in column 1, since an asterisk denotes that a material may or may not be regulated under the class shown depending on whether or not the commodity meets the definition of the class listed for that entry. One commenter stated that tests conducted indicate that pinene has a closed cup flash point range between 99° and 100° F. With a flash point below 100° F., a material meets the definition of a Flammable liquid. With a flash point at or above 100° F. and below 200° F., a material meets the definition of a Combustible liquid. According to MTB data, pinene has two isomers. Alpha-pinene has a flash point of 91° F. Beta-pinene has a flash point of 117° F. The flash point of pinene containing an isomeric mixture falls between 91° and 117° F. and depends on the percentage of each isomer present. Since this rulemaking deletes all asterisks from the Table, pinene, when classed as a Flammable liquid, would be described as Pinene. When classed as a Combustible liquid, pinene would be described as Combustible liquid, n.o.s.

A commenter pointed out that "Alcoholic beverages", classed as Flammable liquid, in containers having a rated capacity of one gallon or less, are not subject to the hazardous materials regulations per § 173.118(c). Thus, the proposed one quart net quantity per package limitation for passenger carrying aircraft is wrong. MTB agrees and column 6(a) in the Table has been changed to read "See § 173.118(c)." This commenter also pointed out that the correct identification number is UN1170 and not NA1987.

Since the proper shipping name Engine, internal combustion has been proposed, one commenter recommended that Motor, internal combustion be deleted from the Table stating: "The motor receives its power from an outside source. The engine develops power internally." MTB does not dispute the commenter's argument, however, the description has been retained. The terms "motor" and "engine" have become synonymous in the automobile industry. MTB seriously doubts that motor companies in this industry would consider changing their names to engine companies.

A commenter objected to the proposed requirement to label hydrogen peroxide solutions (up to and including 52% peroxide) with a corrosive label to identify the secondary hazard. This commenter stated that "the non-corrosiveness for less than 52% is an industry fact." Based on the data presented, MTB has deleted the requirement for a CORROSIVE label on hydrogen peroxide solutions containing not more than 52% peroxide.

Comments were received concerning the new entry and requirements for Calcium hypochlorite, hydrated. The description has been revised to include in italicized print "(minimum 5.5% but not more than 10% water, and more than 39% available chlorine)". The material is a potential hazardous substance and has been so designated by an "E" in column 1 of the Table. The associated RQ is 100/45.4. Specific packaging requirements are referenced to § 173.217. This section contains packaging requirements for similar type compounds. The statement "keep cool and dry" has been added in column 7(c) of § 172.101.

Stowage requirements have been changed to authorize both "on deck" and "below deck" locations on board cargo vessels and passenger vessels for certain potential hazardous substances. The proposed regulation in Docket HM-145B authorized only "below deck" locations which were unduly restrictive.

EPA has changed the reportable quantity (RQ) for Calcium hypochlorite from RQ-10/4.54 to RQ-100/45/4. This change has been incorporated into the entry for Calcium hypochlorite mixture in the Table.

Several hazardous materials that contain one or more potential hazardous substances were not properly identified in the HM-145 proposal. The materials are identified now by an "E" in column 1. The RQ assigned to these materials is based on the RQ of the potential hazardous substance. If two or more potential hazardous substances are present, the lower/lowest RQ value is listed. For example, Nitrating acid (RQ-1000/454) is a mixture containing Nitric acid (RQ-1000/454) and Sulfuric acid (RQ-5000/2270). The other materials in this category that are identified in the Table as potential hazardous substances are Chlorosulfonic acid-sulfur trioxide mixture (RQ-1000/454); Hypochlorite solution (RQ-100/45.4); Methyl bromide and ethylene dibromide mixture, liquid (RQ-1000/454); Nitrating acid (RQ-1000/454); Nitrating acid, spent (RQ-1000/454); Nitrohydrochloric acid (RQ-1000/454); Nitrohydrochloric acid, spent (1000/454); Sodium nitrite mixed with potassium nitrate (RQ-100/45.4); Soduim nitrite mixture (RQ-100/454), and White acid (RQ-5000/2270).

Section 172.102. A new §172.102 is added as proposed in Docket HM-171. This section contains the Optional Table as well as the text necessary to explain the table and implement its use.

Paragraph (a) of this section sets forth the basic purpose of the Optional Table which provides hazardous materials descriptions, classification, labeling and vessel stowage requirements which may be used for certain hazardous materials as an alternative to the corresponding requirements provided in § 172.101. However, materials subject to the DOT regulations that are not considered dangerous under IMCO recommendations must be transported in accordance with the applicable DOT regulations. This exclusion has been included to insure that it is clearly understood that materials such as a combustible liquid with a flash point greater than 141° F. and less than 200° F. (in packagings with a capacity exceeding 110 gallons), which are not considered dangerous according to IMCO definitions are subject to all applicable DOT requirements.

A statement is also included in this paragraph to clarify the fact that many of the materials shown in the Optional Table are not subject to the DOT regulations and that their inclusion in the Optional Table does not constitute a designation of the material as a hazardous material. Only materials (1) designated as hazardous materials in § 172.101, including hazardous wastes and hazardous substances; (2) identified as forbidden in § 172.101; or (3) covered by the prohibition specified in § 173.21 or § 173.51, are subject to the DOT regulations. Entries for materials not designated as hazardous in § 172.101 are retained in the Optional Table to alert persons who may be engaged in importing or exporting such materials that the materials may be considered hazardous under widely applied international standards and to provide basic guidance relative to the classification and labeling of these materials in international transport.

One commenter suggested that proposed § 172.102 should be amended to recognize the fact that materials not regulated by DOT may be described on shipping papers by the IMCO proper shipping name and hazard class, and the package marked and labeled as provided in IMCO. MTB believes this change is unnecessary. Section 172.401, concerning prohibited labeling, specifically authorizes labels prescribed by IMCO to be applied to packages even though the material may not be considered hazardous under the DOT regulations. Regarding shipping paper descriptions and package markings, the DOT regulations do not prohibit description and marking as prescribed by IMCO in the case of materials not regulated by DOT. It is, however, suggested that in such cases the shipping papers bear a notation

§172.101 Hazardous Materials Table (cont'd)

(1) +/E/A/W	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(3A) Identification number	(4) Label(s) required (if not excepted)	(5) Packaging (a) Exceptions	(5) Packaging (b) Specific requirements	(6) Maximum net quantity in one package (a) Passenger carrying aircraft or railcar	(6) Maximum net quantity in one package (b) Cargo only aircraft	(7) Water shipments (a) Cargo vessel	(7) Water shipments (b) Passenger vessel	(7) Water shipments (c) Other requirements
AW	Carbon dioxide, solid, *or* Dry ice, *or* Carbonice	ORM-A	UN1845	None	None	173.615	440 pounds	440 pounds	1	1	Stow away from open ventilators. Stow away from cyanides or cyanide mixtures, liquid or dry
+	Carbon monoxide.	Flammable gas	UN1016	Flammable gas	173.306	173.302	Forbidden	150 pounds	1	4	
	Carbon remover, liquid	Flammable liquid	UN1132	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
EAW	Carbon tetrachloride (*RQ-5000/2270*)	ORM-A	UN1846	None	173.505	173.620	1 quart	55 gallons	1,2	1,2	Stow away from living quarters
	Carbonyl chloride. See Phosgene										
	Carboys, empty, must be classed for the hazardous material previously contained in carboy. See 173.29										
	Cartridge bags, empty, with black powder igniter	Class C explosive		Explosive C	None	173.106	50 pounds	150 pounds	1,3	1,3	
	Cartridge cases, empty, primed	Class C explosive		None	None	173.107	50 pounds	150 pounds	1,3	1,3	
	Cartridge, practice ammunition	Class C explosive		Explosive C	None	173.101a	50 pounds	150 pounds	1,2	1,2	
	Case oil. See Gasoline *or* Naptha										
	Casinghead gasoline, See Gasoline										
W	Castor Beans	ORM-C		None	173.505	173.932			1,2	1,2	Stow away from living quarters and foodstuffs. Bulk shipments permitted in tight vans or containers only on cargo vessels (Castor beans only)
W	Castor pomace. *See* Castor beans										
E	Caustic, potash, dry, solid, flake, bead, *or* granular. *See* Potassium hydroxide, dry, *etc.*										
E	Caustic potash, liquid *or* solution. *See* Potassium hydroxide solution										
E	Caustic soda, dry, solid, flake, bead, *or* granular. *See* Sodium hydroxide, dry, *etc.*										
E	Caustic soda, liquid *or* solution. *See* Sodium hydroxide solution										
W	*Cellosolve. See* Ethylene glycol monoethyl ether										
W	*Cellosolve acetate. See* Ethylene glycol monoethyl ether acetate										
	Cement, adhesive, n.o.s. *See* Cement, liquid, n.o.s.										
	Cement, container, linoleum, tile, *or* wallboard, liquid	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	15 gallons	1,2	1	
	Cement, leather	Flammable liquid	NA1133	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Cement, liquid, n.o.s.	Combustible liquid	NA1133	None	173.118a	None	No limit	No limit	1,2	1,2	
	Cement, liquid; n.o.s.	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	10 gallons	1,2	1	
	Cement, pyroxylin	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	15 gallons	1,2	1	
	Cement, roofing, liquid	Flammable liquid	NA1133	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Cement, rubber	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	15 gallons	1,2	1	
	Cesium metal	Flammable solid	UN1407	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Charcoal, activated	Flammable solid	UN1362	Flammable solid	173.162	173.162	25 pounds	200 pounds	1,3	1,3	
	Charcoal briquettes *or* briquets	Flammable solid	NA1361	Flammable solid	173.162	173.162	50 pounds	50 pounds	1,2	1,2	
	Charcoal screenings, made from 'pinon' wood	Flammable solid	NA1361	Flammable solid	173.162	173.162	25 pounds	200 pounds	1,2	1,	
	Charcoal screenings, wet	Forbidden									
	Charcoal, shell	Flammable solid	NA1361	Flammable solid	173.162	173.162	25 pounds	200 pounds	1,2	1,2	
	Charcoal, wet	Forbidden									
	Charcoal, wood, ground, crushed, granulated, *or* pulverized	Flammable solid	NA1361	Flammable solid	173.162	173.162	25 pounds	200 pounds	1,2	1,2	
	Charcoal, wood, lump	Flammable solid	NA1361	Flammable solid	173.162	173.162	50 pounds	50 pounds	1,2	1,2	
	Charcoal wood screenings, other than 'pinon' wood screenings	Flammable solid	NA1361	Flammable solid	None	173.162	Forbidden	Forbidden	1	1	
	Charged oil well jet perforating gun (*total explosive contents in guns 20 pounds or more per motor vehicle*)	Class A explosive		Explosive A	None	173.53 173.80	Forbidden	Forbidden			Forbidden
	Charged oil well jet perforating gun (*total explosive contents in guns not exceeding 20 pounds per motor vehicle or special offshore down hole tool pallet*)	Class C explosive		Explosive C	None	173.53 173.110	Forbidden	Forbidden	1,2	5	Forbidden

172.102 Optional Hazardous Materials Table (Cont'd)

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMCO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Calcium hypochlorite, *dry, including mixtures containing more than 39% available chlorine (8.8% available oxygen)*	5.1	UN 1748	Oxidizer	II	1,2	1,2	
	Calcium hypochlorite mixtures, *dry containing 39% or less, but more than 10% available chlorine*	9	UN 2208	None	III	1,2	1,2	Stow 'separated from' flammable liquids and acids; 'away from' combustible materials
	Calcium, *metal and alloys, non-pyrophoric*	4.3	UN 1401	Dangerous When Wet	II	1,2	5	
	Calcium nitrate	5.1	UN 1454	Oxidizer	III	1,2	1,2	
	Calcium perchlorate	5.1	UN 1455	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals
	Calcium permanganate	5.1	UN 1456	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and hydrogen peroxide
	Calcium peroxide	5.1	UN 1457	Oxidizer	II	1,2	1,2	Keep dry
	Calcium phosphide	4.3	UN 1360	Dangerous When Wet	I	1	5	
	Calcium, *powdered*	4.2	UN 1855	Spontaneously Combustible	II	1	5	
	Calcium resinate, *fused*	4.1	UN 1314	Flammable Solid	III	1,2	1,2	
	Calcium resinate, *technical pure*	4.1	UN 1313	Flammable Solid	III	1,2	1,2	
	Calcium silicide	4.3	UN 1405	Dangerous When Wet	II	1,2	1,2	
	Calcium silicon	4.3	UN 1406	Dangerous When Wet	III	1,2	1,2	
	Camphor oil	3.3	UN 1130	Flammable Liquid	III	1,3	1,3	
	Capryloyl peroxide. *See* n-Octanoyl peroxide							
	Caps, blasting, *See* Blasting caps							
	Caps, percussion	1.4 S	UN 0044	None. Package to be marked '1.4 S'	–	1,3	1,3	
	Caps, toy. *See* Amorces							
	Carbolic acid. *See* Phenol							
	Carbon, activated	4.2	UN 1362	Spontaneously Combustible	III	1,3	1,3	Keep cool
	Carbon bisulphide. *See* Carbon disulphide							
	Carbon dioxide	2.2	UN 1013	Nonflammable Gas	–	1,2	1,2	
	Carbon dioxide and nitrous oxide, *mixtures*	2.2	UN 1015	Nonflammable Gas	–	1,2	1,2	
	Carbon dioxide and oxygen, *mixtures*	2.2	UN 1014	Nonflammable Gas	–	1,2	1,2	
	Carbon disulphide	3.1	UN 1131	Flammable Liquid, Poison	I	1	5	Keep cool. Not permitted on any vessel carrying explosives.
	Carbon monoxide	2.1	UN 1016	Flammable Gas, Poison Gas	–	1	5	Stow 'away from' living quarters.
	Carbon, non-activated, *of animal or vegetable origin*	4.2	UN 1361	Spontaneously Combustible	III	1,3	1,3	Keep cool. Stow 'away from' oily matter
	Carbon paper. *See* Paper, *treated with unsaturated oils, incompletely dried*							
	Carbon remover, *liquid*	3.2	UN 1132	Flammable Liquid	II	1,2	1	
	Carbon sulphide. *See* Carbon disulphide							
	Carbon tetrabromide	6.1	UN 2516	St. Andrews Cross	III	1,2	1,2	Shade from radiant heat
	Carbon tetrachloride	6.1	UN 1846	Poison	II	1,2	1,2	
	Carbonyl chloride. *See* Phosgene							
	Carbonyl fluoride	2.3	UN 2417	Poison Gas	–	1	5	Stow 'away from' living quarters
	Carbonyl sulfide	2.3	UN 2204	Poison Gas, Flammable Gas	–	1	5	Stow 'away from' living quarters
N	Cartouche	2.1	UN 2037	Flammable Gas	–			
	Cartridge cases, empty, with primer. *See* Cases, cartridges, empty, with primer							
N	Cartridges, flash	1.1G	UN 0049	Explosive (1.1G)	–	–	–	
N	Cartridges, flash	1.3G	UN 0050	Explosive (1.3G)	–	–	–	
	Cartridges for weapons, blank	1.4 C	UN 0338	Explosive (1.4C)	–	1,3	1,3	
	Cartridges for weapons, blank	1.4 S	UN 0014	None. Package to be marked '1.4 S'	–	1,3	1,3	
N	Cartridges for weapons, blank	1.1C	UN 0326	Explosive (1.1C)	–	–	–	
N	Cartridges for weapons, blank	1.3C	UN 0327	Explosive (1.3C)	–	–	–	
	Cartridges for weapons, *other than blank*	1.4 S	UN 0012	None. Package to be marked '1.4 S'	–	1,3	1,3	
N	Cartridges for weapons, *with bursting charge*	1.1E	UN 0006	Explosive (1.1E)	–	–	–	
N	Cartridges for weapons, *with bursting charge*	1.2E	UN 0321	Explosive (1.2E)	–	–	–	
N	Cartridges for weapons, *with bursting charge*	1.1F	UN 0005	Explosive (1.1F)	–	–	–	
N	Cartridges for weapons, *with bursting charge*	1.2F	UN 0007	Explosive (1.2F)	–	–	–	
N	Cartridges for weapons, *with bursting charge*	1.4F	UN 0348	Explosive (1.4F)	–	–	–	
	Cartridges for weapons, with inert projectile	1.4 C	UN 0339	Explosive (1.4C)	–	1,3	1,3	
N	Cartridges for weapons, with inert projectile	1.2C	UN 0328	Explosive (1.2C)	–	–	–	
	Cartridges, oil well	1.4 C	UN 0278	Explosive (1.4C)	–	1,3	1,3	
N	Cartridges, oil well	1.3C	UN 0277	Explosive (1.3C)	–	–	–	
	Cartridges, power device	1.4 C	UN 0276	Explosive (1.4C)	–	1,3	1,3	
	Cartridges, power device	1.4 S	UN 0323	None. Package to be marked '1.4 S'	–	1,3	1,3	
N	Cartridges, power device	1.2C	UN 0381	Explosive (1.2C)	–	–	–	
N	Cartridges, power device	1.3C	UN 0275	Explosive (1.3C)	–	–	–	
	Cartridges, safety. *See* Cartridges for weapons, *other than blank (UN 0012)* or Cartridges for weapons, blank *(UN 0014)*							
	Cartridges, signal	1.4 G	UN 0312	Explosive (1.4G)	–	1,3	1,3	
N	Cartridges, signal	1.3G	UN 0054	Explosive (1.3G)	–	–	–	

* * * * *

(d) Any packaging having a capacity of 110 gallons or less that contains only the residue of a hazardous material covered by Table 2 of this section need not be included in determining the applicability of the placarding requirements.

35. In § 172.519 paragraphs (d) and (f) are revised to read as follows:

§ 172.519 General specifications for placards.

* * * * *

(d) The hazard class and division number prescribed for dangerous goods in the UN Recommendations titled "Transport of Dangerous Goods" may be entered on each placard in the lower corner of the diamond. If a placard is used to display identification numbers as authorized by § 172.334, the class number must be entered in a numeral approximately 1¾ inches (45 mm.) in height (numeral height may be between 1⅝ inches (41 mm.) and 1¾ inches (45 mm.)). They must be black on each placard except on NON-FLAMMABLE GAS, FLAMMABLE GAS, FLAMMABLE, COMBUSTIBLE and CORROSIVE placards. The class numbers on NON-FLAMMABLE GAS, FLAMMABLE GAS and FLAMMABLE placards may be white, and the class numbers on the CORROSIVE placard must be white.

* * * * *

(f) Except as provided in § 172.334, placards shall be as described in this section and as prescribed in Appendix B to this Part.

* * * * *

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

36. In § 173.2 the section title is changed; the introductory text of paragraph (a) is revised; paragraph (a)(16) is added, to read as follows:

§ 173.2 Classification of material.

(a) *Classification of material having more than one hazard as defined in this Part.* Except as provided in paragraph (b) of this section, a hazardous material, having more than one hazard as defined in this Part, must be classed according to the following order of hazards:

* * * * *

(16) ORM–E.

* * * * *

37. Section 173.21 is revised to read as follows:

§ 173.21 Forbidden materials and packages.

Unless otherwise provided in this subchapter, the offering for transportation of the following is forbidden:

(a) A hazardous material in the same packaging, freight container, or overpack with another hazardous material, the mixing of which would be liable to cause a dangerous evolution of heat or gas, or produce corrosive materials, except as provided in §§ 173.152(a) and 173.242(a) and (b).

(b) A package containing a material which is liable to decompose or polymerize at a temperature of 130°F. (54.4°C.) or less with an evolution of a dangerous quantity of heat or gas unless stabilized or inhibited in a manner that will preclude such evolution.

(1) The determination of whether a material is forbidden under this paragraph may be made by one of the following methods: Standard Method of Test for Constant Temperature Stability of Chemical Materials (ASTM E–487–74) or the Self Accelerating Decomposition Temperature (SADT) Test published by the Organic Peroxide Producers' Safety Division (OPPSD).

(2) Refrigeration may be used as a means of stabilization only when approved by the Associate Director for Operations and Enforcement, MTB. (For status of approvals issued by the Bureau of Explosives, see § 171.19 of this subchapter.)

(c) Packages which evolve a dangerous quantity of flammable gas or vapor realeased from a material which would not otherwise be subject to this subchapter, i.e., the release of flammable vapor or gas in such quantities that a flammable mixture with air would be created within a transport vehicle.

(d) Packages containing materials (other than those classed as explosives) which will detonate in a fire. For the purposes of this paragraph, a detonation is a type of explosion in which a shock wave travels through the material at a speed greater than the speed of sound in the undecomposed material. When tests are required to evaluate a package under the provisions of this paragraph, the testing must be done or approved by one of the agencies specified in § 173.86.

(e) Any package containing a cigarette lighter or other similar device with fuel and equipped with an ignition element, unless the design of the device and its packaging insofar as they affect safety in transportation have been examined by the Bureau of Explosives (B of E) and approved by the Associate Director for Operations and Enforcement, MTB. (An approval which was issued by the B of E remains valid to the same extent as if it had been issued by MTB.) For lighters containing gases, also see § 173.308.

38. In § 173.28 the section heading, the introductory text of paragraph (h), and paragraph (n) are revised; paragraph (h)(1) is deleted, paragraphs (i) and (j) are deleted and reserved; paragraph (p) is added to read as follows:

§ 173.28 Reuse of packagings (containers).

* * * * *

(h) Except as provided in paragraphs (m), (n), and (p) of this section, single-trip containers (marked STC) and nonreusable containers (marked NRC) subject to the specification requirement of Part 178 of this subchapter from which contents have been removed following use for transportation of any material, may not be used thereafter for the transportation of hazardous materials.

(i) [Reserved]

(j) [Reserved]

* * * * *

(n) A packaging marked as STC or NRC according to the specification requirements of Part 178 of this subchapter may be reused for the shipment of any corrosive solid, ORM–A, ORM–B, ORM–C, ORM–E or any material not required by this subchapter to be shipped in a DOT specification packaging. Paragraph (m) of this section does not apply to these materials.

* * * * *

(p) A packaging marked NRC or STC according to the specification requirements of Part 178 of this subchapter may be reused for the shipment of hazardous waste to designated facilities subject to the following conditions:

(1) Except as authorized by this paragraph, the waste must be packaged in accordance with this Part and offered for transportation in accordance with the requirements of this subchapter.

(2) Transportation is performed by highway only.

(3) A package is not offered for transportation less than 24 hours after it is finally closed for transportation, and each package is inspected for leakage immediately prior to being offered for transportation.

(4) Each package is loaded by the shipper and unloaded by the consignee, unless the motor carrier is a private or contract carrier.

(5) The packaging may be used only once under this paragraph and may not be used again for shipment of hazardous materials except in accordance with paragraph (m) or (n) of this section.

39. In § 173.29 paragraph (a) is revised; paragraphs (b), (c), and (e) are

cargo tanks, and tank cars. For multi-unit tank car tanks the compliance date is July 1, 1983. On a voluntary basis, the identification number may be displayed on these tanks any time after the July 1, 1980, effective date.

Section 172.336. The proposal did not contain a provision for replacement of lost or missing identification numbers, however, several commenters identified this as a potential problem area needing resolution. This section provides for this occurrence.

Section 172.400. Paragraph (b)(3) is revised to add the words "freight container load" in the sequence of "carload or truckload shipments." This change updates a regulation that was published before freight containers were a common form of transportation and allows MTB to eliminate an exemption (under 49 CFR Part 107, Subpart B). As requested by several commenters, a new paragraph (d) is added to this section and paragraph (a) is revised to insure that packages marked only with a proper shipping name from the Optional Table also will be labeled in accordance with that Table. This reflects the requirement in § 172.202 that the entire basic description and the label requirement must be taken from either the § 172.101 Table or the § 172.102 Optional Table.

Section 172.402. Paragraphs (a)(5) through (a)(9) are added to reflect additional multiple labeling requirements that are established as proposed in Docket HM-126B. Initially, it was considered adequate to have the multiple labling reflected in Column (4) of the Table, but commenters recommended that, for consistency, it be entered in this section. MTB agrees and has so provided. The compliance date of July 1, 1983, is contained in paragraph (a)(10). Voluntary compliance may begin any time after the July 1, 1980, effective date.

Section 172.407. Paragraph (h) is amended for consistency with § 172.102(h) as it was proposed in Docket HM-171. This rule authorizes IMCO specification labels in all cases except Explosives A and Explosives B. This change clarifies that, except for the specifications for color tolerance which must meet DOT requirements, labels may meet either DOT or IMCO specifications, except that a foreign language text alone is authorized only on import shipments. In addition, to eliminate an exemption issued to the Department of Defense to authorize additional text on labels as required by the country of destination, MTB is adding a provision to paragraph (h) of this section authorizing such an addition.

Section 172.503. Section 172.503 is added to provide a reference from the placarding rules to the identification number marking alternative authorized in § 172.334.

Section 172.504. Table 2 in paragraph (a) is revised to provide for using the DANGEROUS placard for Class C explosives. This has been authorized under exemption DOT-E 7902 which was issued after the applicant pointed out that in case of fire involving Class C explosives, emergency response personnel could be injured when taking routine actions applicable to the FLAMMABLE placard without checking to determine what was involved in the fire. A normal precaution for emergency response personnel when observing the DANGEROUS placard is to try to determine the materials involved by obtaining shipping papers or through other available means. Also, changes are made to Table 2 to eliminate the requirement for affixing the DANGEROUS placard for Class C explosives, the BLASTING AGENTS placard for Blasting agents or the OXIDIZER placard for Nitrocarbonitrate, if the freight container or transport vehicle is transporting Class A or B explosives and is appropriately placarded for Class A or Class B explosives. Further provisions are made for affixing only the FLAMMABLE GAS placard when a motor vehicle is transporting Nonflammable gas and Flammable gas. Although these placarding changes had not been proposed, they provide relief from some of the existing rules, eliminate an outstanding exemption and at the same time provide adequate warning for the materials involved. Also, a new paragraph (d) is added to exclude certain packagings containing only the residue of hazardous materials from consideration in determining the applicability of the placarding requirements.

Section 172.519. Paragraph (d) is revised as suggested by commenters to increase the size of the UN hazard class number display on placards. Where such a display had been permissive, it now becomes mandatory in certain situations when required by this subchapter, such as under § 172.334. Paragraph (f) is added to authorize a variance in the placard specification so the alternative identification number marking requirement can be accomplished. The alternative, provided by § 172.334, authorizes the display of identification numbers on the appropriate placard for the hazardous material being transported.

Section 173.2. Paragraph (a)(16) is added to include ORM-E in its proper order of hazard.

Section 173.21. The title is revised and the text is amended as proposed in HM-159 to provide better guidance on materials or packaging conditions that are not acceptable in transportaion. The term "Forbidden materials" in the context of this section is new and clarification of the application of the term is provided. Section 173.21 applies to any material considered to be forbidden and is not limited to materials falling within established hazard classes. Included in the revision of this section is a prohibition against the offering of packages that evolve a dangerous quantity of flammable gas or vapor released from a material not otherwise subject to the regulations, e.g. the release of flammable blowing agent vapors from a manufactured product in such quantities that an explosive mixture would be created within the transport vehicle. Under this final rule, each refrigeration method, when used as a means of stabilization, must be approved by the Associate Director for Operations and Enforcement. This change is in accord with the approval authority withdrawals from the Bureau of Explosives presently being handled by amendments published under Docket HM-163. Several commenters objected to the fact that proposed paragraph (a)(2) did not contain any statement concerning the time a material would have to be exposed to the 130°F. temperature in order to be considered forbidden from transportation. MTB agrees that it is a weakness in the proposed wording and has altered the wording to reference two test methods. The test methods are: ASTM E-487 "Standard Method of Test for Consent Temperature Stability of Chemical Materials" and the Organic Peroxide Producers' Safety Division (OPPSD) "Self Accelerating Decomposition Test (SADT)." Several commenters expressed concern that this paragraph does not make it clear that approvals issued by the Bureau of Explosives would be continued in effect until an orderly transition to approval by the Associate Director for Operations and Enforcement could be accomplished. MTB acknowledges this objection and has included a clarification statement in the rule referencing § 171.19.

Section 173.28. Section 173.28 is amended to consolidate three paragraphs that contain restrictions pertaining to containers marked NRC or STC. Paragraph (n) is amended to include a reference to ORM-E materials regarding reuse of STC-marked

ackagings and a new paragraph (p) is dded to permit the reuse of NRC or TC specification packagings for one-me shipments of hazardous wastes der certain specified conditions. Note e first condition stipulates that the aterial must be packaged "in cordance with this Part". For example, Flammable liquid, n.o.s., must be ckaged in accordance with § 173.119. is reuse authorization for hazardous istes does not permit any deviation m the packaging requirements of Part 3 except as specifically stated. This al rule differs from the Docket HM-A proposal to reflect input from nmenters.

ection 173.29. Section 173.29 is ended, as proposed in Docket HM-A, to require, with certain eptions, a packaging that contains residue of a hazardous material to offered for transportation in the same ner as required when it previously tained a greater quantity of a ardous material. However, there are ificant exceptions in paragraph (a) cerning marking, placarding, ping papers, and stowage. ragraph (a)(3)(ii) excepts from ping paper requirements the sportation by contract or private er of certain "empty" packagings aining a hazardous materials ue when the purpose of the portation is to reuse or recondition ackaging. This was not proposed in otice but was requested by several menters. The exception recognizes ct that private and contract rs who perform this transportation miliar with the hazards and gings involved in the portation of these materials.

tion 173.51. Section 173.51 is d as proposed in the notice to t HM-159 to make provisions for onal coverage of forbidden ials.

tion 173.118a. Section 173.118a is led to exclude a combustible from the 110 gallons or less ion when it is a hazardous waste t to 40 CFR Part 262. Thus, a stible liquid that is a hazardous and is offered for transportation ckaging having a capacity of 110 or less must be shipped as a combustible liquid and all ions pertaining to the rtation of waste materials apply. as not proposed, but is added by sed on a comment that pointed omission. Paragraph (b)(1) is d to include a reference to us waste manifests. Paragraph s revised by MTB to eliminate a between the identification marking requirements for portable tanks, cargo tanks and tank cars in the Docket HM-126A proposal and the exception authorization in paragraph (b). Paragraph (b)(5) is revised to include the hazardous substance discharge reporting requirements of § 171.17.

Section 173.151a. As proposed in Docket HM-126B, paragraph (a)(13) is revised to permit continued classification of a hazardous material according to its predominant hazard when it contains an organic peroxide without having to place a plus before each organic peroxide entry. It is possible that when certain stabilizing dilutents are added to certain organic peroxides the predominant hazard is that of the dilutent rather than the organic peroxide.

Section 173.154. Based on a petition, MTB is adding "Calcium hypochlorite, hydrated" to the Hazardous Materials Table as a proper shipping name with specification packaging referencing § 173.217. In order to eliminate confusion, the reference in § 173.154(a)(20) to hydrated calcium hypochlorite is deleted.

Section 173.179. As proposed in Docket HM-159, § 173.179 is added to prescribe packaging for N-methyl-N'-nitro-N-nitrosoguanidine, which is added to the Table as a Flammable solid.

Section 173.182. The introductory text to paragraphs (a) and (b) are amended as proposed in Docket HM-145B to provide appropriate packaging for the following materials that have been identified by EPA as hazardous substances: Beryllium nitrate, Cupric nitrate, Ferric nitrate, Mercuric nitrate, Nickel nitrate, and Zirconium nitrate.

Section 173.217. Section 173.217 is amended based on a petition for rulemaking requesting that "calcium hypochlorite hydrated" be added to the Table, with a packaging reference to § 173.217. MTB is in agreement with the data presented in the petition and has added the entry.

Section 173.352. The heading and paragraph (a) are revised to include Cyanide solutions, n.o.s. classed as a Poison B, UN 1935, which is added to the Table as proposed in Docket HM-126B. MTB believes the packagings authorized by § 173.352 for sodium cyanide or potassium cyanide are more appropriate for Cyanide solutions, n.o.s. than the general packagings that would otherwise be authorized for this material under § 173.346 for a poisonous liquid, n.o.s.

Section 173.364. Paragraph (a) is revised to provide certain exceptions for Poisonous solid Limited Quantities that are similar to those authorized for Poisonous liquid Limited Quantities. This was an apparent omission from the Docket HM-112 rulemaking and provides relief from certain regulations for shipments of these materials.

Section 173.389. Section 173.389 is amended as proposed in Docket HM-145A to restate the definition of radioactive materials to clarify the fact that the definition applies only for purposes of the Hazardous Materials Regulations. This clarification is necessary since EPA regulations address materials having lower levels of radiation.

Section 173.500. Section 173.500 is amended to clarify the definition of ORM materials. This clarification is essential to implementation of the ORM-E class which is included in new paragraph (b)(5). Note that the ORM-E definition includes hazardous wastes subject to the regulations of the EPA in 40 CFR Part 262, and hazardous substances as defined in § 171.8. Except for the amendment of Note 1, which resulted from a comment about the apparent conflict between the hazardous waste requirements and the exception for combustible liquids in certain packagings, the final rule is as was proposed in Dockets HM-145A and HM-145B.

Section 173.505. Paragraph (a) is revised to acknowledge a restriction on the ORM exceptions in that § 173.21 applies to any hazardous material offered for transportation. As adopted, the provision differs from the HM-145A proposal in format, but the content remains the same.

Section 173.510. Section 173.510 is amended to exclude the basic packaging requirements from the exceptions specified in § 173.505, and a new paragraph (a)(5) is added requiring that transport vehicles used to transport ORM materials must have discharge openings securely closed. This is a significant change from the HM-145A proposal which would have precluded the use of open-top vehicles. Numerous comments were received describing procedures for effectively using tarps to cover dump trucks and other open-top vehicles. MTB believes that many of the comments have merit and has revised the requirement accordingly. MTB added a note in paragraph (a)(1) to inform shippers that EPA has prescribed packaging for certain PCB's for storage for disposal.

Section 173.1300. A new Subpart O is added to Part 173 to address ORM-E materials, and a new § 173.1300 is added to address Hazardous waste, liquid or solid, n.o.s., and Hazardous substance, liquid or solid, n.o.s. These two entries resulted from Dockets HM-145A and

* * * * *

(d) Any packaging having a capacity of 110 gallons or less that contains only the residue of a hazardous material covered by Table 2 of this section need not be included in determining the applicability of the placarding requirements.

35. In § 172.519 paragraphs (d) and (f) are revised to read as follows:

§ 172.519 General specifications for placards.

* * * * *

(d) The hazard class and division number prescribed for dangerous goods in the UN Recommendations titled "Transport of Dangerous Goods" may be entered on each placard in the lower corner of the diamond. If a placard is used to display identification numbers as authorized by § 172.334, the class number must be entered in a numeral approximately 1¾ inches (45 mm.) in height (numeral height may be between 1⅝ inches (41 mm.) and 1¾ inches (45 mm.)). They must be black on each placard except on NON-FLAMMABLE GAS, FLAMMABLE GAS, FLAMMABLE, COMBUSTIBLE and CORROSIVE placards. The class numbers on NON-FLAMMABLE GAS, FLAMMABLE GAS and FLAMMABLE placards may be white, and the class numbers on the CORROSIVE placard must be white.

* * * * *

(f) Except as provided in § 172.334, placards shall be as described in this section and as prescribed in Appendix B to this Part.

* * * * *

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

36. In § 173.2 the section title is changed; the introductory text of paragraph (a) is revised; paragraph (a)(16) is added, to read as follows:

§ 173.2 Classification of material.

(a) *Classification of material having more than one hazard as defined in this Part.* Except as provided in paragraph (b) of this section, a hazardous material, having more than one hazard as defined in this Part, must be classed according to the following order of hazards:

* * * * *

(16) ORM–E

* * * * *

37. Section 173.21 is revised to read as follows:

§ 173.21 Forbidden materials and packages.

Unless otherwise provided in this subchapter, the offering for transportation of the following is forbidden:

(a) A hazardous material in the same packaging, freight container, or overpack with another hazardous material, the mixing of which would be liable to cause a dangerous evolution of heat or gas, or produce corrosive materials, except as provided in §§ 173.152(a) and 173.242(a) and (b).

(b) A package containing a material which is liable to decompose or polymerize at a temperature of 130°F. (54.4°C.) or less with an evolution of a dangerous quantity of heat or gas unless stabilized or inhibited in a manner that will preclude such evolution.

(1) The determination of whether a material is forbidden under this paragraph may be made by one of the following methods: Standard Method of Test for Constant Temperature Stability of Chemical Materials (ASTM E–487–74) or the Self Accelerating Decomposition Temperature (SADT) Test published by the Organic Peroxide Producers' Safety Division (OPPSD).

(2) Refrigeration may be used as a means of stabilization only when approved by the Associate Director for Operations and Enforcement, MTB. (For status of approvals issued by the Bureau of Explosives, see § 171.19 of this subchapter.)

(c) Packages which evolve a dangerous quantity of flammable gas or vapor realeased from a material which would not otherwise be subject to this subchapter, i.e., the release of flammable vapor or gas in such quantities that a flammable mixture with air would be created within a transport vehicle.

(d) Packages containing materials (other than those classed as explosives) which will detonate in a fire. For the purposes of this paragraph, a detonation is a type of explosion in which a shock wave travels through the material at a speed greater than the speed of sound in the undecomposed material. When tests are required to evaluate a package under the provisions of this paragraph, the testing must be done or approved by one of the agencies specified in § 173.86.

(e) Any package containing a cigarette lighter or other similar device with fuel and equipped with an ignition element, unless the design of the device and its packaging insofar as they affect safety in transportation have been examined by the Bureau of Explosives (B of E) and approved by the Associate Director for Operations and Enforcement, MTB. (An approval which was issued by the B of E remains valid to the same extent as if it had been issued by MTB.) For lighters containing gases, also see § 173.308.

38. In § 173.28 the section heading, the introductory text of paragraph (h), and paragraph (n) are revised; paragraph (h)(1) is deleted, paragraphs (i) and (j) are deleted and reserved; paragraph (p) is added to read as follows:

§ 173.28 Reuse of packagings (containers).

* * * * *

(h) Except as provided in paragraphs (m), (n), and (p) of this section, single-trip containers (marked STC) and nonreusable containers (marked NRC) subject to the specification requirement of Part 178 of this subchapter from which contents have been removed following use for transportation of any material, may not be used thereafter for the transportation of hazardous materials.

(i) [Reserved]

(j) [Reserved]

* * * * *

(n) A packaging marked as STC or NRC according to the specification requirements of Part 178 of this subchapter may be reused for the shipment of any corrosive solid, ORM–A, ORM–B, ORM–C, ORM–E or any material not required by this subchapter to be shipped in a DOT specification packaging. Paragraph (m) of this section does not apply to these materials.

* * * * *

(p) A packaging marked NRC or STC according to the specification requirements of Part 178 of this subchapter may be reused for the shipment of hazardous waste to designated facilities subject to the following conditions:

(1) Except as authorized by this paragraph, the waste must be packaged in accordance with this Part and offered for transportation in accordance with the requirements of this subchapter.

(2) Transportation is performed by highway only.

(3) A package is not offered for transportation less than 24 hours after it is finally closed for transportation, and each package is inspected for leakage immediately prior to being offered for transportation.

(4) Each package is loaded by the shipper and unloaded by the consignee, unless the motor carrier is a private or contract carrier.

(5) The packaging may be used only once under this paragraph and may not be used again for shipment of hazardous materials except in accordance with paragraph (m) or (n) of this section.

39. In § 173.29 paragraph (a) is revised; paragraphs (b), (c), and (e) are

DEPARTMENT OF TRANSPORTATION

Research and Special Programs Administration

49 CFR Parts 171, 172, 173, 174, 176, 177

[Docket Nos. HM-118, 126A, 126B, 145A, 145B, 159, and 171; Amdt. Nos. 171-53, 172-58, 173-137, 174-37, 176-11, 177-48]

Identification Numbers, Hazardous Wastes, Hazardous Substances, International Descriptions, Improved Descriptions, Forbidden Materials, and Organic Peroxides

AGENCY: Materials Transportation Bureau (MTB), Research and Special Programs Administration, Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The purpose of this final rule is to accomplish the following: (1) adopt a numerical identification system for hazardous materials transported in commerce; (2) adopt regulations pertaining to the transportation of hazardous wastes; (3) adopt regulations pertaining to the identification of, and discharge notifications for, hazardous substances; (4) list certain forbidden materials by name and revise the general criteria applicable to forbidden materials; (5) provide proper shipping names for organic peroxides; (6) require inclusion on shipping papers of the technical names of certain hazardous components of materials covered by n.o.s. entries; and (7) provide for the optional use of certain United Nations shipping descriptions. The principal objective of this rule, as it pertains to the use of the identification numbers, is to improve the capabilities of emergency response personnel, such as firemen and policemen, to quickly identify hazardous materials and to assure the accurate transmission of information to and from the scenes of accidents involving hazardous materials.

EFFECTIVE DATE: November 20, 1980, unless otherwise specified in the regulations adopted under this rulemaking. Shipments may be prepared, offered for transportation, and transported in accordance with these amendments beginning July 1, 1980.

FOR FURTHER INFORMATION CONTACT: L. Metcalfe (202-426-0656) or Delmer Billings (202-426-2075), Standards Division, Office of Hazardous Materials Regulation, Materials Transportation Bureau, Department of Transportation, Washington, D.C. 20590. Office hours are 8 a.m. to 4:30 p.m. Eastern Time, Monday through Friday.

SUPPLEMENTARY INFORMATION: This action by the Materials Transportation Bureau (MTB) consolidates several related rulemakings into one final rule. By "related", MTB means that in many instances, the same sections of the Hazardous Materials Regulations are affected by the different rulemakings covered by this final rule. The notices of rulemakings containing the proposals, identified by docket number, Federal Register publication, date of publication and title are as follows:

1. Docket HM-118, Notice No. 74-9 (39 FR 25235, July 9, 1974), Expanded Polystyrene Resin and the Definition of a Flammable Solid.

2. Docket HM-145A, Notice No. 78-6 (43 FR 22626, May 25, 1978), Transportation of Hazardous Waste Materials.

3. Docket HM-145B, Notice No. 79-2 (44 FR 10676, February 22, 1979), Transportation of Hazardous Substances.

4. Docket HM-126A, Notice No. 79-9 (44 FR 32972, June 7, 1979), Display of Hazardous Materials Identification Numbers; Improved Emergency Response Capability.

5. Docket HM-126A (additional proposal), Notice No. 79-9 (44 FR 43858, July 26, 1979), Descriptions for Organic Peroxides.

6. Docket HM-159, Notice No. 79-12 (44 FR 43861, July 26, 1979), Forbidden Materials.

7. Docket HM-171, Notice No. 79-11 (44 FR 43864, July 26, 1979), Use of United Nations Shipping Descriptions.

8. Docket HM-126B, Notice No. 79-14 (44 FR 65020, November 8, 1979), Improved Descriptions of Hazardous Materials for Emergency Response.

This consolidated publication of final regulations pertaining to the subjects covered by the dockets identified above was requested by many commenters responding to the different proposals. MTB agrees that all the referenced proposals should be acted upon in one body of final regulations so that persons affected by these new and revised regulations may plan their future business activities relative to training, development and acquisition of shipping documents, the marking of packages, and the development of procedures to comply with the revised incident reporting and newly adopted identification requirements. However, MTB is not able to be fully responsive to those commenters who requested that all of the amendments covered by this action be made effective on the same date (in several comments, the date suggested was two to three years from the date of publication of final regulations). With the exception of regulations pertaining to hazardous wastes, hazardous substances, empty packagings, and certain organic peroxides, more than one year is being provided for the implementation of procedures to comply with the requirements adopted in this action; in fact approximately three years is being provided for compliance with the packaging marking requirements. Instead of specifying a set of lengthy and complicated effective dates in this preamble, the effective date for compliance with each regulation that is effective after November 20, 1980, is set forth in a specific regulation associated with each new or revised requirement. Sections containing compliance dates after November 20, 1980, are § 172.101 (j) and (k); § 172.200(c); § 172.203(k); § 172.300(c)(3); § 172.324(b); § 172.338(c)(6) and (7); and § 172.402(a)(10). The principal requirements that become effective on November 20, 1980 (with certain exceptions) pertain to the transportation of hazardous wastes, hazardous substances, certain forbidden materials (organic peroxides), and empty packagings.

Also bearing on the matter of effective dates, is the requirement for compliance by MTB with the Federal Reports Act of 1942 and procedures administered thereunder by the Office of Management and Budget (OMB) relating to prior clearanc
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of the effective dates prescribed herein.

It should be noted that most of the materials that this rule indicates by name to be "Forbidden" materials in column 3 of the Table in § 172.101 are and have been "Forbidden" materials in the past under general prohibitions. The listing of these materials by name, and the effective dates specified for these amendments, does not change the present "Forbidden" status of these materials if they were not authorized to be offered for transportation prior to this publication.

Concerning special requirements pertaining to hazardous wastes and hazardous substances, it is important to note that those requirements do not apply unless a material is a hazardous waste or a hazardous substance (or both) according to the definitions in § 171.8. This determination is separate

hazardous substances. This decision also addresses the concern expressed by several commenters concerning the unique display of the letter "E" as was proposed in the Notice.

Many commenters discussed the significant impact of the proposed regulations on consumer commodities expressing the view that, if adopted, the effective use of the ORM-D hazard class would be essentially negated and that the concept of limited quantities would be destroyed. MTB believes that this concern has been overcome by the manner in which it has defined hazardous substances for purposes of application of the hazardous materials regulations.

While the regulations for hazardous substances adopted by DOT in these amendments are closely related to those of the EPA found in 40 CFR Part 117, they are not identical in their applicability. EPA's regulations require, without qualification, notification of discharges of reportable quantities of hazardous substances under conditions specified in § 311(b)(5) of the Clean Water Act and, as specified in the notice, provisions of 40 CFR 117.21. The DOT regulations require notification when a reportable quantity is discharged from a package (e.g., a drum, cargo tank motor vehicle or tank car) that is marked or documented as containing a reportable quantity.

Persons who do not have knowledge that a reportable quantity of a hazardous substance has been discharged are not required by EPA to make notifications. MTB has been advised by EPA that it will not bring civil or criminal suit for failure to make notification when such notification is not required by DOT's regulations, unless it can be shown that there was actual knowledge that a reportable quantity was discharged.

Shippers and carriers must also bear in mind that compliance with the provisions of this rule do not relieve them from possible civil liability under § 311 resulting from discharges of reportable quantities. This liability relates to the discharge itself and removal costs and is addressed in regulations promulgated by the EPA and the U.S. Coast Guard.

HM-159 (HM-118)—Forbidden materials

This rule adds the names of materials to the Hazardous Materials Table that MTB considers to be too hazardous to be permitted in commercial transportation. Also, the rule adds N-methy-N'-nitro-N-nitrosoguanidine as a flammable solid and adds a new § 173.179 prescribing packaging requirements for this material. Changes have been made to §§ 173.21 and 173.51 pertaining to forbidden materials and packaging.

A total of 28 comments were received in response to the Notice. All commenters were in general agreement with the proposal to add certain materials considered to be too hazardous for commercial transportation to the Table. A commenter presented data indicating that 2,6-dichloro-4-nitrophenol is not a forbidden material. MTB agrees with the data presented and this material has been removed from the list. The same commenter also stated that some iodoso compounds might be considered forbidden, but that others would not be in this category. Pending further detailed investigation of these substances, the proposed entry of iodoso and iodoxy compounds (dry) has been removed from the list of named forbidden materials.

A comment from a manufacturer of organic peroxides suggested that the term "active oxygen" would be better than "available oxygen" for those entries in the Table containing such limitations. MTB agrees with the commenter and the term "active oxygen" has been substituted for the term "available oxygen."

Two air carrier associations concurred in the proposed § 172.100(d) and suggested that the idea contained in that section be applied to all commodities in the Table. Based on these comments, MTB has reviewed the entire use and meaning of the asterisk in the Table and has decided to eliminate the asterisk, thus allowing a shipper to determine if a specific material should be regulated under the hazard class identified in the Table. However, in conjunction with this change, it is necessary for MTB to introduce a new symbol into the table in order to identify those materials which have been designated as hazardous materials of a particular class, whether or not they meet the definition for the hazard class in which they have been designated. If a shipper wishes to ship a formulation of a material identified by the plus (+) symbol as non-regulated, or in a class other than that specified in the Table, he must supply the Associate Director, Office of Hazardous Materials Regulation, MTB with data which establishes that it does not present a hazard in transportation, or presents a different hazard than that which is listed in the Table.

Another commenter objected to the limiting of peroxyacetic acid to 40% by weight instead of the 43% authorized in the UN Recommendations and the IMCO regulations. There are several current organic peroxide entries which have different concentration limits in the UN Recommendations and the DOT Hazardous Materials Regulations. Since the concentration limits in the UN Recommendations were agreed to by the U.S. delegations to the UN meetings, MTB has revised the limits in the Table to agree with those in the UN Recommendations.

Several commenters objected to all or parts of the proposed revision of § 173.21. Some organic peroxide manufacturers objected to the use of 130°F. in paragraph (a)(2) because their interpretation was that this temperature is the minimum decomposition temperature for which refrigeration would be required. They argued that they have shipped certain organic peroxides with decomposition temperatures of 120°F. without refrigeration for years and, also, that the UN Recommendations use 122°F. as the decomposition or polymerization temperature below which refrigeration is required for the most active organic peroxides. MTB considers 130°F. the maximum temperature that could be expected during transportation, and there are many sections in the regulations which reference 130°F. The fact that an organic peroxide, or any other material, decomposes below 130°F. does not necessarily mean that it must be stabilized or refrigerated. The paragraph states in part "with an evolution of a dangerous quantity of heat or gas . . . ." If the decomposition or polymerization does not create a hazard in transportation, the provisions of the paragraph do not apply regardless of the decomposition temperature of the material. Therefore, the temperature reference of 130°F. has been maintained in the final rule.

Several commenters objected to the fact that § 173.21(a)(2) did not contain a statement concerning the time a material would have to be exposed to the 130°F. temperature in order to be considered forbidden from transportation. MTB agrees that this is a weakness in the proposed wording and has altered the wording of the rule to reference two test methods. The test methods are: ASTM E-487 "Standard Method of Test for Constant Temperature Stability of Chemical Materials" and the Organic Perioxide Producers' Safety Division (OPPSD) "Self Accelerating Decomposition Test (SADT)." Several commenters expressed concern that this paragraph does not make it clear that approvals issued by the Bureau of Explosives would be continued in effect until an orderly transition to approval by the

Associate Director for Operations and Enforcement, MTB could be accomplished. MTB acknowledges the validity of the objection and has included a clarification statement in the rule which references § 171.19.

Several commenters stated that proposed § 173.21(a)(3) was too vague and it was suggested that a phrase be added such as "... e.g., the release of flammable vapor in such quantities that an explosive mixture would be created within the transport vehicle." MTB agrees with this objection, and wording to the effect of that suggested has been included in the rule.

On July 9, 1974, the Hazardous Materials Regulations Board, the predecessor of MTB, published a Notice a Proposed Rulemaking under Docket No. HM-118 proposing to list and classify polystyrene resin, expandable, containing a flammable liquid or gas, as a flammable solid. No final action was taken on this rulemaking proposal. Section 173.21(a)(3) of this rule will forbid the offering for transportation of packages which evolve a dangerous quantity of flammable gas or vapor from a material not otherwise subject to the regulations. MTB believes this prohibition is sufficient to preclude the type of potential hazard which was the concern addressed by the Hazardous Materials Regulations Board in its proposal under Docket No. HM-118. Therefore, the proposals under Docket No. HM-118 are hereby terminated.

Several commenters said that § 173.21(a)(4) needed clarification. The objections were based on the fact that there was no definition of detonation and that there is no recognized test method for determining whether detonation has occurred in a package as a result of a thermal stimulus. In response to the first objection, MTB has included a definition of detonation in the final rule. The second objection is not correct. There are three tests specified in the regulations for determining whether a packaged material detonates as a result of a thermal stimulus. One of these is described in § 173.88(g), Note 2. Another method is found in DOD TB 700-2 (May 19, 1967) which is referenced in §§ 173.86(b) (2) and (3). Both of these test methods have been in the DOT regulations for many years and have been used extensively on both military and commercial materials to determine whether a detonation will occur in a package exposed to a thermal stimulus. While both test methods were designed for testing propellants, they can be and have been used to test other hazardous materials. The third test method is described in § 173.114a(b)(6) and may be used in evaluating whether a detonation has occurred. MTB has considered it inadvisable to reference these methods in this rule because such a reference could suggest that a chemical manufacturer who is not familiar with testing explosives should attempt to perform these tests. This type of testing should be done only by personnel who are well versed in the testing of explosives and this fact has been stated in the rule.

Docket HM-171—Use of United Nations Shipping Descriptions

The amendments under this Docket authorize the use of United Nations shipping descriptions and identification numbers for certain hazardous materials in place of the descriptions required by existing DOT regulations. These amendments are intended to facilitate the international transportation of hazardous materials and to minimize the economic burdens imposed on shippers by the multiplicity of package markings and shipping paper descriptions now required for compliance with both domestic and international requirements. In addition, the amendments provide optional stowage locations for hazardous materials when transported by vessel. The optional stowage locations authorized are those provided for the particular hazardous materials in the International Maritime Dangerous Goods (IMDG) Code published by the Inter-Governmental Maritime Consultative Organization (IMCO).

A number of comments were received which expressed complete support for the proposal. In general, the supporting commenters endorsed the proposal since it would eliminate costly redundancy in shipping paper descriptions and packaging markings. One supporting comment is quoted since it provides some quantification of the importance of the international transportation of chemicals to our economy:

> Shipments of chemicals and allied products were valued at $126.5 billion in 1978. The export activity continued to be strong in 1978 with the value of all chemical exports totaling $12.62 billion, an increase of 16.7 percent over 1977. While the imports of chemicals also increased, the favorable balance of trade in the chemical area increased from $5.84 billion in 1977 to $6.19 billion in 1978, a gain of 6 percent. In the future, these shipments are expected to increase and will be affected by international regulations to a greater degree.

Several comments were received expressing opposition to the proposal. It should first be noted that many of the issues raised concerned the use of IMCO classifications and labeling for certain hazardous materials. Although limited to import and export shipments in the present regulations, this authorization has been a provision of the DOT regulations since adoption of amendments under Docket No. HM-112 in 1976. For this reason, MTB believes it is reasonable to assume that shipper and carrier personnel should, in the execution of their responsibilities in the preparation and acceptance of shipments, already have gained a basic familiarity regarding the use of IMCO classifications and labels as an alternative to the class and labels prescribed for certain hazardous materials in § 172.101.

The fundamental argument raised in opposition to the proposed amendments is that the existence of an optional hazardous materials list will, in the words of one commenter, have a "chaotic effect" on the regulated industries, particularly on the rail and motor carrier industries, because it would complicate the regulations. MTB agrees that the provision of options to various requirements increases the volume of regulations and, to a certain degree, their complexity. In spite of this fact, experience has shown that such regulatory provisions are essential if the regulations are to be effective without unnecessarily burdening industry. For example, it could be argued that the hazardous materials placarding requirements could be vastly simplified by eliminating the "DANGEROUS" placard and certain exceptions to the placarding requirements, and simply requiring that appropriate placards be displayed for each hazardous materials transported regardless of quantity. Such simplification is obviously not in the best interests of the regulated industries and would undoubtedly be declared totally unacceptable by the very commenters who oppose the amendments under Docket HM-171. MTB believes that these amendments will do much to enhance safety by minimizing redundant, conflicting and confusing shipping paper and package marking requirements. Under the current practice of incorporation of IMCO classification and labeling provisions by reference, it is difficult for rail or motor carrier personnel to determine compliance with these provisions. The optional list will eliminate confusion and errors on the part of carrier personnel by making this information readily available to them in § 172.102.

A number of objections to the proposed amendments were raised on the basis of placarding implications. One commenter expressed concern that rail carrier personnel would be unable

classed as Flammable liquid without an asterisk in column 1, since an asterisk denotes that a material may or may not be regulated under the class shown depending on whether or not the commodity meets the definition of the class listed for that entry. One commenter stated that tests conducted indicate that pinene has a closed cup flash point range between 99° and 100° F. With a flash point below 100° F., a material meets the definition of a Flammable liquid. With a flash point at or above 100° F. and below 200° F., a material meets the definition of a Combustible liquid. According to MTB data, pinene has two isomers. Alpha-pinene has a flash point of 91° F. Beta-pinene has a flash point of 117° F. The flash point of pinene containing an isomeric mixture falls between 91° and 117° F. and depends on the percentage of each isomer present. Since this rulemaking deletes all asterisks from the Table, pinene, when classed as a Flammable liquid, would be described as Pinene. When classed as a Combustible liquid, pinene would be described as Combustible liquid, n.o.s.

A commenter pointed out that "Alcoholic beverages", classed as Flammable liquid, in containers having a rated capacity of one gallon or less, are not subject to the hazardous materials regulations per § 173.118(c). Thus, the proposed one quart net quantity per package limitation for passenger carrying aircraft is wrong. MTB agrees and column 6(a) in the Table has been changed to read "See § 173.118(c)." This commenter also pointed out that the correct identification number is UN1170 and not NA1987.

Since the proper shipping name Engine, internal combustion has been proposed, one commenter recommended that Motor, internal combustion be deleted from the Table stating: "The motor receives its power from an outside source. The engine develops power internally." MTB does not dispute the commenter's argument, however, the description has been retained. The terms "motor" and "engine" have become synonymous in the automobile industry. MTB seriously doubts that motor companies in this industry would consider changing their names to engine companies.

A commenter objected to the proposed requirement to label hydrogen peroxide solutions (up to and including 52% peroxide) with a corrosive label to identify the secondary hazard. This commenter stated that "the non-corrosiveness for less than 52% is an industry fact." Based on the data presented, MTB has deleted the requirement for a CORROSIVE label on hydrogen peroxide solutions containing not more than 52% peroxide.

Comments were received concerning the new entry and requirements for Calcium hypochlorite, hydrated. The description has been revised to include in italicized print "(minimum 5.5% but not more than 10% water, and more than 39% available chlorine)". The material is a potential hazardous substance and has been so designated by an "E" in column 1 of the Table. The associated RQ is 100/45.4. Specific packaging requirements are referenced to § 173.217. This section contains packaging requirements for similar type compounds. The statement "keep cool and dry" has been added in column 7(c) of § 172.101.

Stowage requirements have been changed to authorize both "on deck" and "below deck" locations on board cargo vessels and passenger vessels for certain potential hazardous substances. The proposed regulation in Docket HM-145B authorized only "below deck" locations which were unduly restrictive.

EPA has changed the reportable quantity (RQ) for Calcium hypochlorite from RQ-10/4.54 to RQ-100/45/4. This change has been incorporated into the entry for Calcium hypochlorite mixture in the Table.

Several hazardous materials that contain one or more potential hazardous substances were not properly identified in the HM-145 proposal. The materials are identified now by an "E" in column 1. The RQ assigned to these materials is based on the RQ of the potential hazardous substance. If two or more potential hazardous substances are present, the lower/lowest RQ value is listed. For example, Nitrating acid (RQ-1000/454) is a mixture containing Nitric acid (RQ-1000/454) and Sulfuric acid (RQ-5000/2270). The other materials in this category that are identified in the Table as potential hazardous substances are Chlorosulfonic acid-sulfur trioxide mixture (RQ-1000/454); Hypochlorite solution (RQ-100/45.4); Methyl bromide and ethylene dibromide mixture, liquid (RQ-1000/454); Nitrating acid (RQ-1000/454); Nitrating acid, spent (RQ-1000/454); Nitrohydrochloric acid (RQ-1000/454); Nitrohydrochloric acid, spent (1000/454); Sodium nitrite mixed with potassium nitrate (RQ-100/45.4); Soduim nitrite mixture (RQ-100/454), and White acid (RQ-5000/2270).

Section 172.102. A new §172.102 is added as proposed in Docket HM-171. This section contains the Optional Table as well as the text necessary to explain the table and implement its use.

Paragraph (a) of this section sets forth the basic purpose of the Optional Table which provides hazardous materials descriptions, classification, labeling and vessel stowage requirements which may be used for certain hazardous materials as an alternative to the corresponding requirements provided in § 172.101. However, materials subject to the DOT regulations that are not considered dangerous under IMCO recommendations must be transported in accordance with the applicable DOT regulations. This exclusion has been included to insure that it is clearly understood that materials such as a combustible liquid with a flash point greater than 141° F. and less than 200° F. (in packagings with a capacity exceeding 110 gallons), which are not considered dangerous according to IMCO definitions are subject to all applicable DOT requirements.

A statement is also included in this paragraph to clarify the fact that many of the materials shown in the Optional Table are not subject to the DOT regulations and that their inclusion in the Optional Table does not constitute a designation of the material as a hazardous material. Only materials (1) designated as hazardous materials in § 172.101, including hazardous wastes and hazardous substances; (2) identified as forbidden in § 172.101; or (3) covered by the prohibition specified in § 173.21 or § 173.51, are subject to the DOT regulations. Entries for materials not designated as hazardous in § 172.101 are retained in the Optional Table to alert persons who may be engaged in importing or exporting such materials that the materials may be considered hazardous under widely applied international standards and to provide basic guidance relative to the classification and labeling of these materials in international transport.

One commenter suggested that proposed § 172.102 should be amended to recognize the fact that materials not regulated by DOT may be described on shipping papers by the IMCO proper shipping name and hazard class, and the package marked and labeled as provided in IMCO. MTB believes this change is unnecessary. Section 172.401, concerning prohibited labeling, specifically authorizes labels prescribed by IMCO to be applied to packages even though the material may not be considered hazardous under the DOT regulations. Regarding shipping paper descriptions and package markings, the DOT regulations do not prohibit description and marking as prescribed by IMCO in the case of materials not regulated by DOT. It is, however, suggested that in such cases the shipping papers bear a notation

§172.101 Hazardous Materials Table (cont'd)

(1) +/E/A/W	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(3A) Identification number	(4) Label(s) required (if not excepted)	(5) Packaging (a) Exceptions	(5) Packaging (b) Specific requirements	(6) Maximum net quantity in one package (a) Passenger carrying aircraft or railcar	(6) Maximum net quantity in one package (b) Cargo only aircraft	(7) Water shipments (a) Cargo vessel	(7) Water shipments (b) Passenger vessel	(c) Other requirements
AW	Carbon dioxide, solid, *or* Dry ice, *or* Carbonice	ORM-A	UN1845	None	None	173.615	440 pounds	440 pounds	1	1	Stow away from open ventilators. Stow away from cyanides or cyanide mixtures, liquid or dry
+	Carbon monoxide	Flammable gas	UN1016	Flammable gas	173.306	173.302	Forbidden	150 pounds	1	4	
	Carbon remover, liquid	Flammable liquid	UN1133	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
EAW	Carbon tetrachloride (*RQ-5000/2270*)	ORM-A	UN1846	None	173.505	173.620	1 quart	55 gallons	1,2	1,2	Stow away from living quarters
	Carbonyl chloride. See Phosgene										
	Carboys, empty, must be classed for the hazardous material previously contained in carboy. See 173.29										
	Cartridge bags, empty, with black powder igniter	Class C explosive		Explosive C	None	173.106	50 pounds	150 pounds	1,3	1,3	
	Cartridge cases, empty, primed	Class C explosive		None	None	173.107	50 pounds	150 pounds	1,3	1,3	
	Cartridge, practice ammunition	Class C explosive		Explosive C	None	173.101a	50 pounds	150 pounds	1,2	1,2	
	Case oil. See Gasoline *or* Naptha										
	Casinghead gasoline. See Gasoline										
W	Castor Beans	ORM-C		None	173.505	173.952			1,2	1,2	Stow away from living quarters and foodstuffs. Bulk shipments permitted in tight vans or containers only on cargo vessels (Castor beans only).
W	Castor pomace. *See* Castor beans										
E	Caustic, potash, dry, solid, flake, bead, *or* granular. *See* Potassium hydroxide, dry, *etc.*										
E	Caustic potash, liquid *or* solution, *See* Potassium hydroxide solution										
E	Caustic soda, dry, solid, flake, bead, *or* granular. *See* Sodium hydroxide, dry, *etc.*										
E	Caustic soda, liquid *or* solution. *See* Sodium hydroxide solution										
W	*Cellosolve. See* Ethylene glycol monoethyl ether										
W	*Cellosolve acetate. See* Ethylene glycol monoethyl ether acetate										
	Cement, adhesive, n.o.s. *See* Cement, liquid, n.o.s.										
	Cement, container, linoleum, tile, *or* wallboard, liquid	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	15 gallons	1,2	1	
	Cement, leather	Flammable liquid	NA1133	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Cement, liquid, n.o.s.	Combustible liquid	NA1133	None	173.118a	None	No limit	No limit	1,2	1,2	
	Cement, liquid, n.o.s.	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	10 gallons	1,2	1	
	Cement, pyroxylin	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	15 gallons	1,2	1	
	Cement, roofing, liquid	Flammable liquid	NA1133	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Cement, rubber	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	15 gallons	1,2	1	
	Cesium metal	Flammable solid	UN1407	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Charcoal, activated	Flammable solid	UN1362	Flammable solid	173.162	173.162	25 pounds	200 pounds	1,3	1,3	
	Charcoal briquettes *or* briquets	Flammable solid	NA1361	Flammable solid	173.162	173.162	50 pounds	50 pounds	1,2	1,2	
	Charcoal screenings, made from 'pinon' wood	Flammable solid	NA1361	Flammable solid	173.162	173.162	25 pounds	200 pounds	1,2	1,	
	Charcoal screenings, wet	Forbidden									
	Charcoal, shell	Flammable solid	NA1361	Flammable solid	173.162	173.162	25 pounds	200 pounds	1,2	1,2	
	Charcoal, wet	Forbidden									
	Charcoal, wood, ground, crushed, granulated, *or* pulverized	Flammable solid	NA1361	Flammable solid	173.162	173.162	25 pounds	200 pounds	1,2	1,2	
	Charcoal, wood, lump	Flammable solid	NA1361	Flammable solid	173.162	173.162	50 pounds	50 pounds	1,2	1,2	
	Charcoal wood screenings, other than 'pinon' wood screenings	Flammable solid	NA1361	Flammable solid	None	173.162	Forbidden	Forbidden	1	1	
	Charged oil well jet perforating gun (*total explosive contents in guns 20 pounds or more per motor vehicle*)	Class A explosive		Explosive A	None	173.53 173.80	Forbidden	Forbidden			Forbidden
	Charged oil well jet perforating gun (*total explosive contents in guns not exceeding 20 pounds per motor vehicle or special offshore down hole tool pallet*)	Class C explosive		Explosive C	None	173.53 173.110	Forbidden	Forbidden	1,2	5	Forbidden

172.102 Optional Hazardous Materials Table (Cont'd)

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMCO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Calcium hypochlorite, *dry, including mixtures containing more than 39% available chlorine (8.8% available oxygen)*	5.1	UN 1748	Oxidizer	II	1,2	1,2	
	Calcium hypochlorite mixtures, *dry containing 39% or less, but more than 10% available chlorine*	9	UN 2208	None	III	1,2	1,2	Stow 'separated from' flammable liquids and acids, 'away from' combustible materials
	Calcium, *metal and alloys, non-pyrophoric*	4.3	UN 1401	Dangerous When Wet	II	1,2	5	
	Calcium nitrate	5.1	UN 1454	Oxidizer,	III	1,2	1,2	
	Calcium perchlorate	5.1	UN 1455	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals
	Calcium permanganate	5.1	UN 1456	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and hydrogen peroxide
	Calcium peroxide	5.1	UN 1457	Oxidizer	II	1,2	1,2	Keep dry
	Calcium phosphide	4.3	UN 1360	Dangerous When Wet	I	1	5	
	Calcium, *powdered*	4.2	UN 1855	Spontaneously Combustible	II	1	5	
	Calcium resinate, *fused*	4.1	UN 1314	Flammable Solid	III	1,2	1,2	
	Calcium resinate, *technical pure*	4.1	UN 1313	Flammable Solid	III	1,2	1,2	
	Calcium silicide	4.3	UN 1405	Dangerous When Wet	II	1,2	1,2	
	Calcium silicon	4.3	UN 1406	Dangerous When Wet	III	1,2	1,2	
	Camphor oil	3.3	UN 1130	Flammable Liquid	III	1,3	1,3	
	Capryloyl peroxide. *See* n-Octanoyl peroxide							
	Caps, blasting, *See* Blasting caps							
	Caps, percussion	1.4 S	UN 0044	None. Package to be marked '1.4 S'	--	1,3	1,3	
	Caps, toy. *See* Amorces							
	Carbolic acid. *See* Phenol							
	Carbon, activated	4.2	UN 1362	Spontaneously Combustible	III	1,3	1,3	Keep cool
	Carbon bisulphide. *See* Carbon disulphide							
	Carbon dioxide.	2.2	UN 1013	Nonflammable Gas	--	1,2	1,2	
	Carbon dioxide and nitrous oxide, *mixtures*	2.2	UN 1015	Nonflammable Gas	--	1,2	1,2	
	Carbon dioxide and oxygen, *mixtures*	2.2	UN 1014	Nonflammable Gas	--	1,2	1,2	
	Carbon disulphide	3.1	UN 1131	Flammable Liquid, Poison	I	1	5	Keep cool. Not permitted on any vessel carrying explosives
	Carbon monoxide	2.1	UN 1016	Flammable Gas, Poison Gas	--	1	5	Stow 'away from' living quarters
	Carbon, non-activated, *of animal or vegetable origin*	4.2	UN 1361	Spontaneously Combustible	III	1,3	1,3	Keep cool. Stow 'away from' oily matter
	Carbon paper. See Paper, *treated with unsaturated oils, incompletely dried*							
	Carbon remover, *liquid*	3.2	UN 1132	Flammable Liquid	II	1,2	1	
	Carbon sulphide. *See* Carbon disulphide							
	Carbon tetrabromide	6.1	UN 2516	St. Andrews Cross	III	1,2	1,2	Shade from radiant heat
	Carbon tetrachloride	6.1	UN 1846	Poison	II	1,2	1,2	
	Carbonyl chloride. See Phosgene							
	Carbonyl fluoride	2.3	UN 2417	Poison Gas	--	1	5	Stow 'away from' living quarters
	Carbonyl sulfide	2.3	UN 2204	Poison Gas, Flammable Gas	--	1	5	Stow 'away from' living quarters
N	Cartouche	2.1	UN 2037	Flammable Gas	--			
	Cartridge cases, empty, with primer. *See* Cases, cartridges, empty, with primer							
N	Cartridges, flash	1.1G	UN 0049	Explosive (1.1G)	--	--	--	
N	Cartridges, flash	1.3G	UN 0050	Explosive (1.3G)	--	--	--	
	Cartridges for weapons, blank	1.4 C	UN 0338	Explosive (1.4C)	--	1,3	1,3	
	Cartridges for weapons, blank	1.4 S	UN 0014	None. Package to be marked '1.4 S'	--	1,3	1,3	
N	Cartridges for weapons, blank	1.1C	UN 0326	Explosive (1.1C)	--	--	--	
N	Cartridges for weapons, blank	1.3C	UN 0327	Explosive (1.3C)	--	--	--	
	Cartridges for weapons, *other than blank*	1.4 S	UN 0012	None. Package to be marked '1.4 S'	--	1,3	1,3	
N	Cartridges for weapons, *with bursting charge*	1.1E	UN 0006	Explosive (1.1E)	--	--	--	
N	Cartridges for weapons, *with bursting charge*	1.2E	UN 0321	Explosive (1.2E)	--	--	--	
N	Cartridges for weapons, *with bursting charge*	1.1F	UN 0005	Explosive (1.1F)	--	--	--	
N	Cartridges for weapons, *with bursting charge*	1.2F	UN 0007	Explosive (1.2F)	--	--	--	
N	Cartridges for weapons, *with bursting charge*	1.4F	UN 0348	Explosive (1.4F)	--	--	--	
	Cartridges for weapons, with inert projectile	1.4 C	UN 0339	Explosive (1.4C)	--	1,3	1,3	
N	Cartridges for weapons, with inert projectile	1.2C	UN 0328	Explosive (1.2C)	--	--	--	
	Cartridges, oil well	1.4 C	UN 0278	Explosive (1.4C)	--	1,3	1,3	
N	Cartridges, oil well	1.3C	UN 0277	Explosive (1.3C)	--	--	--	
	Cartridges, power device	1.4 C	UN 0276	Explosive (1.4C)	--	1,3	1,3	
	Cartridges, power device	1.4 S	UN 0323	None. Package to be marked '1.4 S'	--	1,3	1,3	
N	Cartridges, power device	1.2C	UN 0381	Explosive (1.2C)	--	--	--	
N	Cartridges, power device	1.3C	UN 0275	Explosive (1.3C)	--	--	--	
	Cartridges, safety. *See* Cartridges for weapons, *other than blank (UN 0012) or* Cartridges for weapons, blank *(UN 0014)*							
	Cartridges, signal	1.4 G	UN 0312	Explosive (1.4G)	--	1,3	1,3	
N	Cartridges, signal	1.3G	UN 0054	Explosive (1.3G)	--	--	--	

* * * * *

(d) Any packaging having a capacity of 110 gallons or less that contains only the residue of a hazardous material covered by Table 2 of this section need not be included in determining the applicability of the placarding requirements.

35. In § 172.519 paragraphs (d) and (f) are revised to read as follows:

§ 172.519 General specifications for placards.

* * * * *

(d) The hazard class and division number prescribed for dangerous goods in the UN Recommendations titled "Transport of Dangerous Goods" may be entered on each placard in the lower corner of the diamond. If a placard is used to display identification numbers as authorized by § 172.334, the class number must be entered in a numeral approximately 1¾-inches (45 mm.) in height (numeral height may be between 1⅝ inches (41 mm.) and 1¾ inches (45 mm.)). They must be black on each placard except on NON-FLAMMABLE GAS, FLAMMABLE GAS, FLAMMABLE, COMBUSTIBLE and CORROSIVE placards. The class numbers on NON-FLAMMABLE GAS, FLAMMABLE GAS and FLAMMABLE placards may be white, and the class numbers on the CORROSIVE placard must be white.

* * * * *

(f) Except as provided in § 172.334, placards shall be as described in this section and as prescribed in Appendix B to this Part.

* * * * *

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

36. In § 173.2 the section title is changed; the introductory text of paragraph (a) is revised; paragraph (a)(16) is added, to read as follows:

§ 173.2 Classification of material.

(a) *Classification of material having more than one hazard as defined in this Part.* Except as provided in paragraph (b) of this section, a hazardous material, having more than one hazard as defined in this Part, must be classed according to the following order of hazards:

* * * * *

(16) ORM–E.

* * * * *

37. Section 173.21 is revised to read as follows:

§ 173.21 Forbidden materials and packages.

Unless otherwise provided in this subchapter, the offering for transportation of the following is forbidden:

(a) A hazardous material in the same packaging, freight container, or overpack with another hazardous material, the mixing of which would be liable to cause a dangerous evolution of heat or gas, or produce corrosive materials, except as provided in §§ 173.152(a) and 173.242(a) and (b).

(b) A package containing a material which is liable to decompose or polymerize at a temperature of 130°F. (54.4°C.) or less with an evolution of a dangerous quantity of heat or gas unless stabilized or inhibited in a manner that will preclude such evolution.

(1) The determination of whether a material is forbidden under this paragraph may be made by one of the following methods: Standard Method of Test for Constant Temperature Stability of Chemical Materials (ASTM E–487–74) or the Self Accelerating Decomposition Temperature (SADT) Test published by the Organic Peroxide Producers' Safety Division (OPPSD).

(2) Refrigeration may be used as a means of stabilization only when approved by the Associate Director for Operations and Enforcement, MTB. (For status of approvals issued by the Bureau of Explosives, see § 171.19 of this subchapter.)

(c) Packages which evolve a dangerous quantity of flammable gas or vapor realeased from a material which would not otherwise be subject to this subchapter, i.e., the release of flammable vapor or gas in such quantities that a flammable mixture with air would be created within a transport vehicle.

(d) Packages containing materials (other than those classed as explosives) which will detonate in a fire. For the purposes of this paragraph, a detonation is a type of explosion in which a shock wave travels through the material at a speed greater than the speed of sound in the undecomposed material. When tests are required to evaluate a package under the provisions of this paragraph, the testing must be done or approved by one of the agencies specified in § 173.86.

(e) Any package containing a cigarette lighter or other similar device with fuel and equipped with an ignition element, unless the design of the device and its packaging insofar as they affect safety in transportation have been examined by the Bureau of Explosives (B of E) and approved by the Associate Director for Operations and Enforcement, MTB. (An approval which was issued by the B of E remains valid to the same extent as if it had been issued by MTB.) For lighters containing gases, also see § 173.308.

38. In § 173.28 the section heading, the introductory text of paragraph (h), and paragraph (n) are revised; paragraph (h)(1) is deleted, paragraphs (i) and (j) are deleted and reserved; paragraph (p) is added to read as follows:

§ 173.28 Reuse of packagings (containers).

* * * * *

(h) Except as provided in paragraphs (m), (n), and (p) of this section, single-trip containers (marked STC) and nonreusable containers (marked NRC) subject to the specification requirement of Part 178 of this subchapter from which contents have been removed following use for transportation of any material, may not be used thereafter for the transportation of hazardous materials.

(i) [Reserved]

(j) [Reserved]

* * * * *

(n) A packaging marked as STC or NRC according to the specification requirements of Part 178 of this subchapter may be reused for the shipment of any corrosive solid, ORM–A, ORM–B, ORM–C, ORM–E or any material not required by this subchapter to be shipped in a DOT specification packaging. Paragraph (m) of this section does not apply to these materials.

* * * * *

(p) A packaging marked NRC or STC according to the specification requirements of Part 178 of this subchapter may be reused for the shipment of hazardous waste to designated facilities subject to the following conditions:

(1) Except as authorized by this paragraph, the waste must be packaged in accordance with this Part and offered for transportation in accordance with the requirements of this subchapter.

(2) Transportation is performed by highway only.

(3) A package is not offered for transportation less than 24 hours after it is finally closed for transportation, and each package is inspected for leakage immediately prior to being offered for transportation.

(4) Each package is loaded by the shipper and unloaded by the consignee, unless the motor carrier is a private or contract carrier.

(5) The packaging may be used only once under this paragraph and may not be used again for shipment of hazardous materials except in accordance with paragraph (m) or (n) of this section.

39. In § 173.29 paragraph (a) is revised; paragraphs (b), (c), and (e) are

cargo tanks, and tank cars. For multi-unit tank car tanks the compliance date is July 1, 1983. On a voluntary basis, the identification number may be displayed on these tanks any time after the July 1, 1980, effective date.

Section 172.338. The proposal did not contain a provision for replacement of lost or missing identification numbers, however, several commenters identified this as a potential problem area needing resolution. This section provides for this occurrence.

Section 172.400. Paragraph (b)(3) is revised to add the words "freight container load" in the sequence of "carload or truckload shipments." This change updates a regulation that was published before freight containers were a common form of transportation and allows MTB to eliminate an exemption (under 49 CFR Part 107, Subpart B). As requested by several commenters, a new paragraph (d) is added to this section and paragraph (a) is revised to insure that packages marked only with a proper shipping name from the Optional Table also will be labeled in accordance with that Table. This reflects the requirement in § 172.202 that the entire basic description and the label requirement must be taken from either the § 172.101 Table or the § 172.102 Optional Table.

Section 172.402. Paragraphs (a)(5) through (a)(9) are added to reflect additional multiple labeling requirements that are established as proposed in Docket HM-126B. Initially, it was considered adequate to have the multiple labling reflected in Column (4) of the Table, but commenters recommended that, for consistency, it be entered in this section. MTB agrees and has so provided. The compliance date of July 1, 1983, is contained in paragraph (a)(10). Voluntary compliance may begin any time after the July 1, 1980, effective date.

Section 172.407. Paragraph (h) is amended for consistency with § 172.102(h) as it was proposed in Docket HM-171. This rule authorizes IMCO specification labels in all cases except Explosives A and Explosives B. This change clarifies that, except for the specifications for color tolerance which must meet DOT requirements, labels may meet either DOT or IMCO specifications, except that a foreign language text alone is authorized only on import shipments. In addition, to eliminate an exemption issued to the Department of Defense to authorize additional text on labels as required by the country of destination, MTB is adding a provision to paragraph (h) of this section authorizing such an addition.

Section 172.503. Section 172.503 is added to provide a reference from the placarding rules to the identification number marking alternative authorized in § 172.334.

Section 172.504. Table 2 in paragraph (a) is revised to provide for using the DANGEROUS placard for Class C explosives. This has been authorized under exemption DOT-E 7902 which was issued after the applicant pointed out that in case of fire involving Class C explosives, emergency response personnel could be injured when taking routine actions applicable to the FLAMMABLE placard without checking to determine what was involved in the fire. A normal precaution for emergency response personnel when observing the DANGEROUS placard is to try to determine the materials involved by obtaining shipping papers or through other available means. Also, changes are made to Table 2 to eliminate the requirement for affixing the DANGEROUS placard for Class C explosives, the BLASTING AGENTS placard for Blasting agents or the OXIDIZER placard for Nitrocarbonitrate, if the freight container or transport vehicle is transporting Class A or B explosives and is appropriately placarded for Class A or Class B explosives. Further provisions are made for affixing only the FLAMMABLE GAS placard when a motor vehicle is transporting Nonflammable gas and Flammable gas. Although these placarding changes had not been proposed, they provide relief from some of the existing rules, eliminate an outstanding exemption and at the same time provide adequate warning for the materials involved. Also, a new paragraph (d) is added to exclude certain packagings containing only the residue of hazardous materials from consideration in determining the applicability of the placarding requirements.

Section 172.519. Paragraph (d) is revised as suggested by commenters to increase the size of the UN hazard class number display on placards. Where such a display had been permissive, it now becomes mandatory in certain situations when required by this subchapter, such as under § 172.334. Paragraph (f) is added to authorize a variance in the placard specification so the alternative identification number marking requirement can be accomplished. The alternative, provided by § 172.334, authorizes the display of identification numbers on the appropriate placard for the hazardous material being transported.

Section 173.2. Paragraph (a)(16) is added to include ORM-E in its proper order of hazard.

Section 173.21. The title is revised and the text is amended as proposed in HM-159 to provide better guidance on materials or packaging conditions that are not acceptable in transportaion. The term "Forbidden materials" in the context of this section is new and clarification of the application of the term is provided. Section 173.21 applies to any material considered to be forbidden and is not limited to materials falling within established hazard classes. Included in the revision of this section is a prohibition against the offering of packages that evolve a dangerous quantity of flammable gas or vapor released from a material not otherwise subject to the regulations, e.g. the release of flammable blowing agent vapors from a manufactured product in such quantities that an explosive mixture would be created within the transport vehicle. Under this final rule, each refrigeration method, when used as a means of stabilization, must be approved by the Associate Director for Operations and Enforcement. This change is in accord with the approval authority withdrawals from the Bureau of Explosives presently being handled by amendments published under Docket HM-163. Several commenters objected to the fact that proposed paragraph (a)(2) did not contain any statement concerning the time a material would have to be exposed to the 130°F. temperature in order to be considered forbidden from transportation. MTB agrees that it is a weakness in the proposed wording and has altered the wording to reference two test methods. The test methods are: ASTM E-487 "Standard Method of Test for Consent Temperature Stability of Chemical Materials" and the Organic Peroxide Producers' Safety Division (OPPSD), "Self Accelerating Decomposition Test (SADT)." Several commenters expressed concern that this paragraph does not make it clear that approvals issued by the Bureau of Explosives would be continued in effect until an orderly transition to approval by the Associate Director for Operations and Enforcement could be accomplished. MTB acknowledges this objection and has included a clarification statement in the rule referencing § 171.19.

Section 173.28. Section 173.28 is amended to consolidate three paragraphs that contain restrictions pertaining to containers marked NRC or STC. Paragraph (n) is amended to include a reference to ORM-E materials regarding reuse of STC-marked

ackagings and a new paragraph (p) is dded to permit the reuse of NRC or TC specification packagings for one- me shipments of hazardous wastes ider certain specified conditions. Note e first condition stipulates that the aterial must be packaged "in cordance with this Part". For example, Flammable liquid, n.o.s., must be ckaged in accordance with § 173.119. is reuse authorization for hazardous istes does not permit any deviation m the packaging requirements of Part except as specifically stated. This al rule differs from the Docket HM- A proposal to reflect input from nmenters.

ection 173.29. Section 173.29 is ended, as proposed in Docket HM- A, to require, with certain eptions, a packaging that contains residue of a hazardous material to offered for transportation in the same ner as required when it previously tained a greater quantity of a ardous material. However, there are ificant exceptions in paragraph (a) cerning marking, placarding, ping papers, and stowage. ragraph (a)(3)(ii) excepts from ping paper requirements the sportation by contract or private er of certain "empty" packagings aining a hazardous materials ue when the purpose of the portation is to reuse or recondition ackaging. This was not proposed in lotice but was requested by several menters. The exception recognizes ct that private and contract rs who perform this transportation miliar with the hazards and gings involved in the portation of these materials.

tion 173.51. Section 173.51 is d as proposed in the notice to t HM-159 to make provisions for onal coverage of forbidden ials.

tion 173.118a. Section 173.118a is led to exclude a combustible from the 110 gallons or less ion when it is a hazardous waste t to 40 CFR Part 262. Thus, a stible liquid that is a hazardous and is offered for transportation ckaging having a capacity of 110 or less must be shipped as a combustible liquid and all ions pertaining to the rtation of waste materials apply. as not proposed, but is added by ised on a comment that pointed omission. Paragraph (b)(1) is d to include a reference to us waste manifests. Paragraph s revised by MTB to eliminate a between the identification marking requirements for portable tanks, cargo tanks and tank cars in the Docket HM-126A proposal and the exception authorization in paragraph (b). Paragraph (b)(5) is revised to include the hazardous substance discharge reporting requirements of § 171.17.

Section 173.151a. As proposed in Docket HM-126B, paragraph (a)(13) is revised to permit continued classification of a hazardous material according to its predominant hazard when it contains an organic peroxide without having to place a plus before each organic peroxide entry. It is possible that when certain stabilizing dilutents are added to certain organic peroxides the predominant hazard is that of the dilutent rather than the organic peroxide.

Section 173.154. Based on a petition, MTB is adding "Calcium hypochlorite, hydrated" to the Hazardous Materials Table as a proper shipping name with specification packaging referencing § 173.217. In order to eliminate confusion, the reference in § 173.154(a)(20) to hydrated calcium hypochlorite is deleted.

Section 173.179. As proposed in Docket HM-159, § 173.179 is added to prescribe packaging for N-methyl-N'-nitro-N-nitrosoguanidine, which is added to the Table as a Flammable solid.

Section 173.182. The introductory text to paragraphs (a) and (b) are amended as proposed in Docket HM-145B to provide appropriate packaging for the following materials that have been identified by EPA as hazardous substances: Beryllium nitrate, Cupric nitrate, Ferric nitrate, Mercuric nitrate, Nickel nitrate, and Zirconium nitrate.

Section 173.217. Section 173.217 is amended based on a petition for rulemaking requesting that "calcium hypochlorite hydrated" be added to the Table, with a packaging reference to § 173.217. MTB is in agreement with the data presented in the petition and has added the entry.

Section 173.352. The heading and paragraph (a) are revised to include Cyanide solutions, n.o.s. classed as a Poison B, UN 1935, which is added to the Table as proposed in Docket HM-126B. MTB believes the packagings authorized by § 173.352 for sodium cyanide or potassium cyanide are more appropriate for Cyanide solutions, n.o.s. than the general packagings that would otherwise be authorized for this material under § 173.346 for a poisonous liquid, n.o.s.

Section 173.364. Paragraph (a) is revised to provide certain exceptions for Poisonous solid Limited Quantities that are similar to those authorized for Poisonous liquid Limited Quantities. This was an apparent omission from the Docket HM-112 rulemaking and provides relief from certain regulations for shipments of these materials.

Section 173.389. Section 173.389 is amended as proposed in Docket HM-145A to restate the definition of radioactive materials to clarify the fact that the definition applies only for purposes of the Hazardous Materials Regulations. This clarification is necessary since EPA regulations address materials having lower levels of radiation.

Section 173.500. Section 173.500 is amended to clarify the definition of ORM materials. This clarification is essential to implementation of the ORM-E class which is included in new paragraph (b)(5). Note that the ORM-E definition includes hazardous wastes subject to the regulations of the EPA in 40 CFR Part 262, and hazardous substances as defined in § 171.8. Except for the amendment of Note 1, which resulted from a comment about the apparent conflict between the hazardous waste requirements and the exception for combustible liquids in certain packagings, the final rule is as was proposed in Dockets HM-145A and HM-145B.

Section 173.505. Paragraph (a) is revised to acknowledge a restriction on the ORM exceptions in that § 173.21 applies to any hazardous material offered for transportation. As adopted, the provision differs from the HM-145A proposal in format, but the content remains the same.

Section 173.510. Section 173.510 is amended to exclude the basic packaging requirements from the exceptions specified in § 173.505, and a new paragraph (a)(5) is added requiring that transport vehicles used to transport ORM materials must have discharge openings securely closed. This is a significant change from the HM-145A proposal which would have precluded the use of open-top vehicles. Numerous comments were received describing procedures for effectively using tarps to cover dump trucks and other open-top vehicles. MTB believes that many of the comments have merit and has revised the requirement accordingly. MTB added a note in paragraph (a)(1) to inform shippers that EPA has prescribed packaging for certain PCB's for storage for disposal.

Section 173.1300. A new Subpart O is added to Part 173 to address ORM-E materials, and a new § 173.1300 is added to address Hazardous waste, liquid or solid, n.o.s., and Hazardous substance, liquid or solid, n.o.s. These two entries resulted from Dockets HM-145A and

* * * * *

(d) Any packaging having a capacity of 110 gallons or less that contains only the residue of a hazardous material covered by Table 2 of this section need not be included in determining the applicability of the placarding requirements.

35. In § 172.519 paragraphs (d) and (f) are revised to read as follows:

§ 172.519 General specifications for placards.

* * * * *

(d) The hazard class and division number prescribed for dangerous goods in the UN Recommendations titled "Transport of Dangerous Goods" may be entered on each placard in the lower corner of the diamond. If a placard is used to display identification numbers as authorized by § 172.334, the class number must be entered in a numeral approximately 1¾ inches (45 mm.) in height (numeral height may be between 1⅝ inches (41 mm.) and 1¾ inches (45 mm.)). They must be black on each placard except on NON-FLAMMABLE GAS, FLAMMABLE GAS, FLAMMABLE, COMBUSTIBLE and CORROSIVE placards. The class numbers on NON-FLAMMABLE GAS, FLAMMABLE GAS and FLAMMABLE placards may be white, and the class numbers on the CORROSIVE placard must be white.

* * * * *

(f) Except as provided in § 172.334, placards shall be as described in this section and as prescribed in Appendix B to this Part.

* * * * *

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

36. In § 173.2 the section title is changed; the introductory text of paragraph (a) is revised; paragraph (a)(16) is added, to read as follows:

§ 173.2 Classification of material.

(a) *Classification of material having more than one hazard as defined in this Part.* Except as provided in paragraph (b) of this section, a hazardous material, having more than one hazard as defined in this Part, must be classed according to the following order of hazards:

* * * * *

(16) ORM–E

* * * * *

37. Section 173.21 is revised to read as follows:

§ 173.21 Forbidden materials and packages.

Unless otherwise provided in this subchapter, the offering for transportation of the following is forbidden:

(a) A hazardous material in the same packaging, freight container, or overpack with another hazardous material, the mixing of which would be liable to cause a dangerous evolution of heat or gas, or produce corrosive materials, except as provided in §§ 173.152(a) and 173.242(a) and (b).

(b) A package containing a material which is liable to decompose or polymerize at a temperature of 130°F. (54.4°C.) or less with an evolution of a dangerous quantity of heat or gas unless stabilized or inhibited in a manner that will preclude such evolution.

(1) The determination of whether a material is forbidden under this paragraph may be made by one of the following methods: Standard Method of Test for Constant Temperature Stability of Chemical Materials (ASTM E–487–74) or the Self Accelerating Decomposition Temperature (SADT) Test published by the Organic Peroxide Producers' Safety Division (OPPSD).

(2) Refrigeration may be used as a means of stabilization only when approved by the Associate Director for Operations and Enforcement, MTB. (For status of approvals issued by the Bureau of Explosives, see § 171.19 of this subchapter.)

(c) Packages which evolve a dangerous quantity of flammable gas or vapor realeased from a material which would not otherwise be subject to this subchapter, i.e., the release of flammable vapor or gas in such quantities that a flammable mixture with air would be created within a transport vehicle.

(d) Packages containing materials (other than those classed as explosives) which will detonate in a fire. For the purposes of this paragraph, a detonation is a type of explosion in which a shock wave travels through the material at a speed greater than the speed of sound in the undecomposed material. When tests are required to evaluate a package under the provisions of this paragraph, the testing must be done or approved by one of the agencies specified in § 173.86.

(e) Any package containing a cigarette lighter or other similar device with fuel and equipped with an ignition element, unless the design of the device and its packaging insofar as they affect safety in transportation have been examined by the Bureau of Explosives (B of E) and approved by the Associate Director for Operations and Enforcement, MTB. (An approval which was issued by the B of E remains valid to the same extent as if it had been issued by MTB.) For lighters containing gases, also see § 173.308.

38. In § 173.28 the section heading, the introductory text of paragraph (h), and paragraph (n) are revised; paragraph (h)(1) is deleted, paragraphs (i) and (j) are deleted and reserved; paragraph (p) is added to read as follows:

§ 173.28 Reuse of packagings (containers).

* * * * *

(h) Except as provided in paragraphs (m), (n), and (p) of this section, single-trip containers (marked STC) and nonreusable containers (marked NRC) subject to the specification requirement of Part 178 of this subchapter from which contents have been removed following use for transportation of any material, may not be used thereafter for the transportation of hazardous materials.

(i) [Reserved]

(j) [Reserved]

* * * * *

(n) A packaging marked as STC or NRC according to the specification requirements of Part 178 of this subchapter may be reused for the shipment of any corrosive solid, ORM–A, ORM–B, ORM–C, ORM–E or any material not required by this subchapter to be shipped in a DOT specification packaging. Paragraph (m) of this section does not apply to these materials.

* * * * *

(p) A packaging marked NRC or STC according to the specification requirements of Part 178 of this subchapter may be reused for the shipment of hazardous waste to designated facilities subject to the following conditions:

(1) Except as authorized by this paragraph, the waste must be packaged in accordance with this Part and offered for transportation in accordance with the requirements of this subchapter.

(2) Transportation is performed by highway only.

(3) A package is not offered for transportation less than 24 hours after it is finally closed for transportation, and each package is inspected for leakage immediately prior to being offered for transportation.

(4) Each package is loaded by the shipper and unloaded by the consignee, unless the motor carrier is a private or contract carrier.

(5) The packaging may be used only once under this paragraph and may not be used again for shipment of hazardous materials except in accordance with paragraph (m) or (n) of this section.

39. In § 173.29 paragraph (a) is revised; paragraphs (b), (c), and (e) are

Foster
§173.21
Forbidden Materials
04-0050

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Research and Special Programs Administration
Department of Transportation
Office of Hazardous Materials Standards, DHM-10

March 8, 2004

Attn: Mr. Edward Mazzullo, Director

Re.: Petition for Letter of Interpretation

Dear Mr. Mazzullo,

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In particular I write this informal letter requesting yet another letter which might clarify the differences between the previous two received. I would appreciate you commenting on the following questions which we discussed last week.

Initially, we discussed the time frame around which the letter dated the 24th of February, 2004, was written in. Can you confirm that this letter was written in the context of the current regulations. Secondly, that when packages are selected for hazardous commodities, when the shipper has, or should have, knowledge that the package size selected may adversely contribute to the commodities thermal stability - that the shipper is required to determine if the commodity meets SADT criteria, regardless of whether the package is generally authorized by the regulations.

I appreciate any help you can provide me in responding to the above questions, again thank you for your time and consideration in this matter.

Sam Rogers

Capt. Sam Rogers
Chief, Liner Activities
National Cargo Bureau, Inc.

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Sam Rogers

Capt. Sam Rogers
Chief, Liner Activities
National Cargo Bureau, Inc.

17 BATTERY PLACE ■ SUITE 1232 ■ NEW YORK, NEW YORK 10004

Foster, Glenn (DHM-10)

From: Mazzullo, Ed
Sent: Monday, March 15, 2004 7:32 AM
To: Gorsky, Susan; Foster, Glenn (DHM-10); Hochman, Charles
Subject: FW: Matters relating to requested meeting re calcium hypochlorite hydrated litigation developments

FYI

Ed

-----Original Message-----
From: Gordon Rousseau [mailto:gorrou@pipeline.com]
Sent: Sunday, March 14, 2004 9:32 PM
To: Mazzullo, Ed
Cc: Wybenga, Frits; Ke, Charles; Richard, Bob
Subject: Matters relating to requested meeting re calcium hypochlorite hydrated litigation developments

Dear Mr. Mazzullo:

Thank you for your work in quickly arranging a DOT/PPG meeting as I requested last Friday. In terms of attendees representing PPG, the participants will be Lawrence I. Kiern, attorney with Winston & Strawn (representing PPG in the litigation process) and myself, an expert witness for PPG in the litigation. (You have met with Mr. Kiern on two other occasions that I am aware of.) From the DOT side, I think that it now has become a policy matter so I am hoping that at least counsel and Mr. Wybenga as Deputy, in addition will be able to attend. We will have with us additional material relating to the case should anyone wish to see more background detail.

I thought that some summary of the situation would be in order to assure that we are all considering the same issues.

The meeting has become necessary because of the National Cargo Bureau representative's position stated during his deposition on March 11th in the litigation I described to you (M/V D.G. Harmony). Though being aware of your letter to me, he continues to maintain his original position, essentially based on two reasons: (1) the February 24th DOT letter to me only applies to the current regulations (as told to him by DOT) implying that it therefore does not apply to the 1998 rules and, (2) that the forbidden materials SADT testing rules (173.21(f)) apply for the calcium hypochlorite hydrated shipment made in 1998, though the material was listed in 172.101 and authorized in the packaging used.

You will recall that his original position was that though the material was listed with authorized packaging, SADT testing was nevertheless required before the specific 1998 calcium hypochlorite hydrated shipments could be made. Thus, he is now stating that based on DOT's own words (1) the testing that had already been done earlier and related data are not recognized by DOT and (2) that the regulations do not authorize the product in the subject packaging without additional SADT testing. His letter is carefully drafted to guide your response to support his conclusions. In his view, PPG was required by the regulations to conduct an SADT test before shipping that 1998 material because it was a forbidden material. He advised us at the deposition that he was confirming this position in a letter to DOT. I will have a copy of his deposition for the meeting for your information.

It becomes clear that the objective for the specific and careful wording of the March 8th letter from Capt Rogers to you wherein he states

"Can you confirm that this letter [the February 23rd letter you wrote to me] was written in the context of the current regulations."

and further:

"that when packages are selected for hazardous commodities, when the shipper has, or should have, knowledge that the package size selected may adversely contribute to the commodities (sic) thermal stability - that the shipper is required to determine if the commodity meets SADT criteria, regardless of whether the package is generally authorized by the regulations",

is an effort to demonstrate by DOT's own words in reply that relief from SADT testing does not apply to calcium hypochlorite, hydrated, UN2880, under the circumstances in the subject packaging in the sense of testing in 1998, notwithstanding that this matter was already addressed by DOT in providing the entry that is in the regulations, actually since at least 1980 and again in 1991, and again in 1999 through 2002. As we discussed, the material as packaged was allowed and has continued to be allowed under the regulations on the basis of all this information developed earlier. So while it is true as he states that the shipper may be required to determine "if the commodity meets SADT criteria", he carefully avoids mentioning that this had already been done through knowledge developed by shippers and passed on to DOT for purposes of rulemaking and representation at IMO and the UN, such that the specific SADT testing he describes was not required by the DOT regulations before the 1998 shipment on the basis of the material being forbidden, because it was already an authorized material in the subject packaging.

As you will recall during our February 23rd meeting I noted that the reason for my letter request was to address the applicability of required SADT testing for calcium hypochlorite, hydrated, UN2880, in specified 300 lb. and 425 lb. packaging. I summarized how the information was already known, known as a result of work done in the 1978-1981 period by Olin and data presented in the IMO (IMCO) meetings at the time which data was more recently reevaluated and confirmed in information presented to you in the 1999 - 2003 period, both at the UN and IMO. In addition, we discussed in our meeting that your letter to me addressing current regulations addressed the 1998 situation since the regulation in question had not changed since 1991.

Any further correspondence to us or any response you make to Capt Rogers must clarify these situations, i.e., that the DOT answer in 2004 is applicable to the 1998 shipment, i.e., it is no different than the answer that would have been given to the same inquiry in 1998, since the regulations are unchanged. If this is not addressed unambiguously, based on his deposition, he will testify on the basis of DOT information (as he describes it), and this error will go uncorrected.

In addition, making only an unexplained reply to the second issue raised by Capt. Rogers March 8th letter, it will be used (as you can see from his notes of the meeting), to imply that calcium hypochlorite, hydrated, UN2880, in the specified packaging, requires SADT testing before it may be shipped by any shipper.

I believe that problems raised by such erroneous information (described as being DOT's position) leads to very serious implications for DOT as well which makes it a policy matter for the Agency. Insofar as the record is clear that RSPA has known for years about these shipments since this is the major calcium hypochlorite product that has been shipped in the United States for the last two decades, the Court could only find on the basis of such information from NCB that shipments as involved in the Harmony ship loss, have been allowed knowingly by DOT, in non-compliance with the regulations, and that DOT for thousands of shipments over the years has done nothing about it, i.e., it was a forbidden material. Of course we know that this is not true but an apparent lack of DOT enforcement of knowing non-compliance would be linked to this disastrous incident, an unavoidable conclusion of the litigation under such circumstances. None of us desire such an outcome.

Thank you for your continued attention to this matter. Please call me if you (Frits, Charles and Bob as well) have any question.

Sincerely,

Gordon Rousseau

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Melbourne Beach, FL 32951
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Research and Special Programs Administration
Department of Transportation
Office of Hazardous Materials Standards, DHM-10

March 8, 2004

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INTERNATIONAL MARITIME ORGANIZATION

IMO

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SUB-COMMITTEE ON DANGEROUS GOODS,
SOLID CARGOES AND CONTAINERS
5th session
Agenda item 13

DSC 5/13
24 February 2000
Original: ENGLISH

REPORT TO THE MARITIME SAFETY COMMITTEE

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been considered at IMO and MSC/Circ.886 on Recommendation on safety of personnel during container securing operations had been issued.

6.19 The Norwegian delegation, pointing out that container top safety is closely related to cargo stowage and securing, expressed the view that it would be useful for the Organization to collect the information on Member State's national legislation relating thereto.

Establishment of the drafting group

6.20 The Sub-Committee established a drafting group to prepare draft amendments to Annex 13 of the CSS Code, taking into account document DSC 5/6/3.

6.21 Having received the report of the drafting group (DSC 5/WP.5), the Sub-Committee agreed with the draft MSC Circular on amendments to Annex 13 of the CSS Code (DSC 5/WP.5, annex), as amended and set out in annex 7, for submission to MSC 72 for approval.

7 CASUALTY AND INCIDENT REPORTS AND ANALYSIS

7.1 The Sub-Committee noted that three issues needed consideration under this agenda item, namely:

- Safe transport of calcium hypochlorite;
- Results of inspections on packaged dangerous goods; and
- Casualty reports.

Safe transport of calcium hypochlorite

7.2 The Sub-Committee, recalling that it had agreed to consider the issue under this item (paragraph 1.8), noted that the E&T Group (DSC 5/3/1, paragraphs 6 to 1), at its last session, in the interest of safety at sea and protection of the marine environment, and in light of the recent spate of incidents allegedly involving calcium hypochlorite, had considered the issue of safe transport of the hazardous substance.

7.3 In this context, the Sub-Committee was informed that, the International Group of P&I Associations (P and I) at the September/October 1999 session, drew the attention of the E&T Group to the fact that the research was ongoing and non-conclusive yet, and that recent investigations appear to indicate, that the temperature at which reactions would start, reduces as the size of the packaging increases, that is, the larger the package, the lower the critical temperature. Furthermore, the presence of impurities in the substance, which could be due to the manufacturing process, could make the substance self-reactive at lower temperatures.

7.4 P and I (DSC 5/3/6), in describing the hazards of cargoes of calcium hypochlorite, recommended an amendment to the IMDG Code for marine transport of calcium hypochlorite and indicated the need for further research.

7.5 P and I expressed the view that calcium hypochlorite has self-reactive properties and falls within the UN definition provided by the UN Recommendations on the Transport of Dangerous Goods Manual of Tests and Criteria Second Revised Edition 1995 page 284 – *"If a substance is being tested to determine whether it is a self-reactive substance of Division 4.1, a test of series H, or a suitable alternative test, should be performed to determine if its SADT would be less than or equal to 75°C when transported in a 50 kg package"*.

7.6 P and I was of the opinion that the scientific results showed, that this material had an SADT well below 75°C, in fact for a 45 kg package it had been determined by a US manufacturer to be about 52°C (for a 50 kg package the SADT would be lower and for a freight container, containing 50kg packages, the SADT would be considerably lower). A 50 kg package of a material with a SADT of equal to or less than 55°C should be transported according to the Control and Emergency Temperature requirements of the IMDG Code, Amendment 29-98 (section 21, page 155).

The IMDG Code (section 5.2.4, page 20) stipulated that the primary hazard of self-reactive substances in Class 4.1 always takes precedence. The Code also stipulated (section 5.2.1, page 19) that for substances having multiple hazards the most stringent packaging group takes precedence. P and I was of the fact that calcium hypochlorite was both a self-reactive substance and an oxidising agent did not justify the failure to subject the substance to the Control and Emergency Temperature requirements of the IMDG Code. Calcium hypochlorite should be subject to such a regime to minimise the risk of future ship casualties arising from the carriage of this chemical.

The temperatures quoted above were for substances free from contamination, whether introduced during the manufacturing process, or during subsequent handling. Contamination of the substance would lead to it being more unstable and manufacturers should be required by certification to demonstrate that their product was fit for transport.

7.7 Japan (DSC 5/INF.6), in responding to the P and I (DSC 5/3/6) submission on inviting the Sub-Committee to note the outcome of its research regarding the heat accumulation storage test, carried out to evaluate the risk involved in the transport of calcium hypochlorite products, made in Japan, concluded that these products would be transported safely, as long as the IMDG Code stowage requirement "away from sources of heat where temperatures in excess of 55°C for a period of 24 hours or more will be encountered" is complied with.

7.8 Japan emphasized that any changes to the IMDG Code needed to be made after the results of the ongoing investigations into the causes of the accidents involving the substance, calcium hypochlorite, were concluded and results made available.

7.9 Japan further informed the Sub-Committee that no dangerous signs had been observed during the heat accumulation stowage test of calcium hypochlorite products by using plastic drums containing 50 kg content at 40°C for three months.

7.10 Germany (DSC 5/3/27) proposed that, in view of the reported accidents of calcium hypochlorite at sea, there was a need for the reconsideration of classification, packing and stowage/segregation requirements relating to the transport of calcium hypochlorite.

7.11 Several delegations expressed the view that any proposals concerning classification should be submitted to the UN Committee of Experts.

7.12 Germany, in providing additional information on accident analysis, highlighted that in their view significant causes for all accidents had been the stowage near sources of heat (tanks of heavy fuel oil), the transport of calcium hypochlorite in cargo containments and the long duration of voyages, which were inherent in maritime transport. Additionally, the decomposition of calcium hypochlorite could be initiated by impurities, such as, powered metals (iron, manganese, cobalt, magnesium) and their compounds.

7.13 In addition to the proposals in document DSC 5/3/27, Germany made the following recommendations:

.1 prohibition of the transport of insufficiently stable products;

.2 certification and documentation by the manufacturer that unstable by-products were not present;

.3 controls to ensure that hazardous unstable material was not being transported;

.4 access to most important information on the product, such as, materials safety data sheets, for all involved personnel;

.5 handled in as dry a form as possible and kept away from direct sun light ;

.6 transported in well-sealed containment, which was not to be opened during transport; and

.7 separated from all organic materials.

7.14 The United States (DSC 5/3/30) provided information from the North American producers of calcium hypochlorite in response to topics addressed in the submission of P and I (DSC 5/3/6). This information addressed issues concerning material properties and classification, packaging, considerations, experience in maritime transport and views on the overall adequacy of the current requirements in the IMDG Code and on the proposed changes to these requirements that were included in document DSC 5/3/6. Among the information presented, the North American producers identified the lack of adequate marine accident investigation data to support the proposals made in DSC 5/3/6. In addition, the North American producers stressed that the limited single drum experiments and their theoretical extrapolations do not provide a valid basis for the proposals related to material reclassification, packaging size limitations or the conclusions about material properties and their behaviour when packed in container loads.

7.15 Canada (DSC 5/3/31) invited the Sub-Committee to consider keeping the existing requirements in the IMDG Code for the transport of calcium hypochlorite unchanged and to develop an MSC circular, emphasizing compliance with the existing provisions for the safe sea transport of these products.

7.16 IUMI, ICS and P and I (DSC 5/3/10) highlighted, amongst others, the concern of the shipping industry regarding the dangerous risk of future injury and loss of life for crews on board vessels, carrying calcium hypochlorite, as well as severe damage to property, and proposed necessary changes to the relevant entries in the IMDG Code in order to prevent future casualties.

7.17 CEFIC in commenting on the issue, drew the attention of the Sub-Committee to the fact that calcium hypochlorite is used, amongst others, to purify water for human consumption and in many situations is the only source of safe drinking water. As many shipping lines were now refusing to carry calcium hypochlorite, it was imperative to resolve this complex issue. The representative of CEFIC commented that the P and I study had not been independently verified and some results conflict with those of previous studies. The extremely complex chemical and thermal properties of calcium hypochlorite had been studied in depth over many years and the current IMDG Code is based on this extensive body of established information. Of the 9 shipboard incidents only 2 vessels were carrying calcium hypochlorite UN 2880 and in these cases there is evidence that the relevant provisions of current IMDG Code may not have been complied with. Where the Code has been correctly observed, a well established history of safe shipment of thousands of containers annually exists. The practical experience of safe shipment of UN 2880 over many years contradicts the experimental and theoretical findings of the study. In 4 of the 9 incidents UN 2208 was carried but the P and I study does not include UN 2208. Potential unintended consequences can occur with such a complex chemical, if changes are made without proper evaluation. The proposed use, for example,

of mechanically cooled containers could cause other hazards due to condensation or the inability to dissipate heat if cooling power is lost. The CEFIC view was that changes to the IMDG Code were not required or appropriate. CEFIC supported the view that an MSC circular should be issued as a way forward to solve this problem.

7.18 The delegation of Cyprus suggested that in order for the Sub-Committee to make an informed decision on this subject, it needed to be provided with further information relating to the volume of these cargoes transported worldwide, whether there was a specific substance of calcium hypochlorite that was affected and whether this problem was restricted to any specific geographical area.

7.19 The Sub-Committee, after a careful and elaborate consideration of the issue, decided to prepare a draft MSC Circular, using DSC 5/3/27 (Germany) as the basic document, at this session, for approval by MSC 72, on amendments and guidance to the current transport provisions in the IMDG Code for this cargo.

7.20 Having received the report of the Drafting Group on this issue (DSC 5/WP.6), the Sub-Committee endorsed the draft MSC Circular on the transport of calcium hypchlorite, as amended and set out in annex 8 for approval by MSC 72.

7.21 The Sub-Committee instructed the E&T Group to make the relevant changes to Amendment 30 taking into consideration the amendments enumerated in draft MSC Circular on the transport of calcium hypochlorite.

7.22 The Sub-Committee invited Members to make submissions to DSC 6 on the final outcome of the ongoing research and the results of accident investigations.

Deferral of consideration of the documents

7.23 Owing to lack of time, the Sub-Committee decided to defer consideration of the following documents to DSC 6:

DSC 5/7	Canada	Reports on cargo transport units (CTUs) under fumigation but undeclared as such
DSC 5/7/1	Netherlands	Results of inspections on packaged dangerous goods
DSC 5/7/2	Canada	Results of inspections on packaged dangerous goods
DSC 5/7/3	Estonia and Finland	Charcoal: UN 1361
DSC 5/7/4	United States	Results of inspections on packaged dangerous goods
DSC 5/7/5	United Kingdom	Results of inspections on packaged dangerous goods
DSC 5/7/6	Belgium	Cargo not compliant with marking in the bill of lading
DSC 5/7/7	Norway	Results of inspection and control of dangerous goods and securing of goods

ANNEX 8

DRAFT MSC CIRCULAR

Transport of Calcium Hypochlorite

1 The Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC), at its fifth session, having received a considerable number of submissions by Governments and international organizations and prompted by recent incidents involving the transport of Calcium Hypochlorite by sea, agreed that there was a need for guidance on the transport provisions of the International Maritime Dangerous Goods (IMDG) Code, for these products.

2 The problems that led to these incidents may be related to operational matters or substance properties or impurities or a combination thereof or there may be causes unrelated to Calcium Hypochlorite. In view of these, as yet unexplained, incidents and ongoing research, the Sub-Committee agreed to take additional precautionary measures and to this end amend some of the packaging, stowage and segregation requirements and properties and observations in the IMDG Code for these products.

3 Considering the importance of providing Administrations, competent authorities and other parties concerned with clear advice regarding the application of the IMDG Code, the Sub-Committee agreed that, in view of the above, these requirements needed to be brought to the attention of Member Governments.

4 The Maritime Safety Committee, at its seventy-second session (17 to 26 May 2000), adopted the amended provisions, as set out at annex, as part of Amendment 30-00 to the IMDG Code, and approved the present circular.

5 The Committee endorsed the view of the Sub-Committee, based on the information available to the Organization at this time, that strict compliance with the provisions of the IMDG Code, as amended, provides for the safe transport, by sea, of Calcium Hypochlorite of Class 5.1. UN Nos. 1748, 2208 and 2880.

6 Member Governments are invited to bring this circular to the attention of shipowners, ship operators, seafarers, shippers, terminal operations and other parties concerned, and to urge them to strictly apply the relevant provisions of the IMDG Code, as amended, as early as possible.

ANNEX

AMENDMENTS TO PACKAGING, STOWAGE AND SEGREGATION PROVISIONS AND PROPERTIES AND OBSERVATIONS FOR CALCIUM HYPOCHLORITE, UN Nos. 1748, 2208 AND 2880

The existing IMDG Code (29-98) requirements for Calcium Hypochlorite have been amended as below and have also been incorporated in Amendment 30-00:

PACKAGING

Bags, IBCs and Bulk packagings are not allowed.

STOWAGE AND SEGREGATION

Stowage

Category D

Cargo transport units should be shaded from direct sunlight and stowed away from sources of heat. Packages in cargo transport units should be stowed so as to allow for adequate air circulation throughout the cargo.

Segregation

"Separated from" powdered metals and their compounds, ammonium compounds, cyanides, hydrogen peroxides and liquid organic substances.

PROPERTIES AND OBSERVATIONS

White or yellowish solid (powder, granules or tablets) with chlorine-like odour. Soluble in water. May cause fire in contact with organic material or ammonium compounds.

Substances are liable to exothermic decomposition at elevated temperatures. This condition may lead to fire or explosion. Decomposition can be initiated by heat or by impurities (*e.g.* powdered metals (iron, manganese, cobalt, magnesium) and their compounds).

Liable to heat slowly.

Reacts with acids, evolving chlorine, an irritating, corrosive and toxic gas. In the presence of moisture, corrosive to most metals.

Dust irritates mucous membranes.

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FACSIMILE COVER PAGE

To: Edward T. Mazzullo (Business Fa	From: Gordon Rousseau
Fax #: 12023663012	Fax #: 413-622-7627
Company: Department Of Transportation	Tel #: 321-951-3220
Subject:	
Sent: 3/17/2004 at 9:39:42 AM	Pages: 3 (including cover)

MESSAGE:

Dear Mr. Mazzullo,

Attached is my letter to you addressing Capt. Rogers' March 8th to DOT. I would appreciate a copy of any reply that you send you him about this matter.

Gordon Rousseau

CC:
F. Wybenga
R. Richard
C. Ke

GORDON W. ROUSSEAU

5448 Solway Drive
Melbourne Beach, FL 32951

Tel 321-951-3220
Fax 413-622-7627

March 17, 2004

Mr. Edward T. Mazzullo, Director
Office of Hazardous Materials Standards, DHM-10
Research and Special Programs Administration
Department of Transportation
Washington, DC 20590

Dear Mr. Mazzullo:

On February 24, 2004, you wrote a letter to Captain Sam Rogers of the National Cargo Bureau, Inc. ("NCB") about the application of the DOT Hazardous Materials Regulations ("HMR") to calcium hypochlorite hydrated, UN2880. By letter dated March 8, 2004, Capt. Rogers has requested a further letter of interpretation from RSPA, to "clarify the differences" between the February 24th letter and another of January 16, 2004. You will recall that your January 16, 2004 letter responded to a November 2003 letter from Capt. Rogers in which he asked a generic question about the HMR without informing you he would use the information received from you to interpret the HMR with respect to UN 2880 in a pending litigation.

As you are now aware, Capt. Rogers has been hired by ship owners as an expert witness in the litigation concerning a fire aboard the MV DG Harmony in November 1998. One can infer from his request that RSPA "confirm" that your February 24th letter "was written in the context of the current regulations," the unstated suggestion that UN 2880 *would* have been forbidden under the DOT regulations existing in November 1998. That is the litigation position that Capt. Rogers seeks to advance in the Harmony litigation. His objective in writing you is to cite DOT as the authority for his mistaken interpretation of the regulations.

Clearly his misinterpretation does not reflect DOT's application of the HMR to calcium hypochlorite hydrated. UN 2880 has *never* been a forbidden material. It has always been viewed by DOT as safe if transported in accordance with applicable DOT and IMDG Code requirements—including the requirements existing in 1998 as well as those of today. That fact, reflected in DOT's consistent position at the IMO and UN since 1978, is plainly the thrust of RSPA's February 24th letters both to Capt. Rogers and to me. Neither of these letters contains any suggestion that UN 2880 has ever been considered by DOT to be a forbidden material.

Indeed, I find it curious as you undoubtedly must under the circumstances, that Capt. Rogers has failed to ask RSPA about the specific position he seeks to advance in the litigation—*i.e.*, was UN 2880 a forbidden material in November 1998? In RSPA's response to Capt.

Rogers' March 8th letter, I respectfully request that RSPA confirm what has always been the case, *i.e.*, UN 2880 is not, and never has been when in packaging authorized under § 172.101, a forbidden material under the HMR, including § 173.21.

Capt. Rogers has also asked you to confirm that when a shipper has or should have knowledge "that the package size selected may adversely contribute to the commodities (sic) thermal stability," then the shipper is required "to determine if the commodity meets SADT criteria, regardless of whether the package is generally authorized by the regulations." Whatever is meant by this request—which is also again in general terms rather than being specific to the product—it is prompted by Capt. Rogers' interest in suggesting, in the DG Harmony litigation, that the shipper of the UN 2880, PPG Industries, Inc. ("PPG"), violated DOT regulations by shipping UN 2880 in 300 lb. fibre drums in which the product is known to have an SADT threshold of slightly less than 50°C.

The purpose of Capt. Rogers's request aside, there should be no confusion between RSPA's two letters to NCB, the first a simple recitation of general provisions of the HMR and the second which applies the HMR *specifically* to the packaging of UN 2880. As RSPA has stated, UN 2880 does not become a forbidden material simply because it is shipped in packages having an SADT of 50°C or less. In RSPA's response to Capt. Rogers's second request, it would seem that DOT should simply state that UN 2880 is not, and was not in 1998, a forbidden material under the HMR provided it is and was shipped in accordance with prevailing DOT and IMDG Code regulations, including in packages authorized by the HMR.

I am grateful for RSPA staff's continued time and attention. Please fax me a copy of any response you provide to Capt. Rogers' letter of March 8th to you. Should you have any questions, please let me know.

Sincerely,

Gordon W. Rousseau

U.S. Department
of Transportation
**Research and
Special Programs
Administration**

COPY FOR YOUR INFORMATION

400 Seventh St., S.W.
Washington, D.C. 20590

FEB 24 2004

Mr. Gordon W. Rousseau
5448 Solway Drive
Melbourne Beach, Florida 32951

Dear Mr. Rousseau:

This responds to your February 23, 2004 letter on behalf of PPG Industries, Inc., concerning the transportation of calcium hypochlorite, hydrated, UN 2880, under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you ask if calcium hypochlorite, hydrated, UN 2880, transported in 300- and 425-lb. fiber drums, is a forbidden material within the meaning of § 173.21 of the HMR.

The answer is no. Notwithstanding that the self-accelerated decomposition temperature (SADT) of calcium hypochlorite, hydrated, UN 2880, in the drums is slightly less than 50 °C, the material is not forbidden under § 173.21 because the material is not likely to decompose under normal conditions of transport when shipped in accordance with applicable regulatory requirements. Under the HMR, calcium hypochlorite, hydrated, UN 2880, is not subject to the controlled temperature provisions of § 173.21(f) when transported in the quantities and packagings specified in your letter. All applicable HMR requirements for shipping documentation, packaging, marking, labeling, placarding, and stowage and segregation must be met. Similarly, calcium hypochlorite, hydrated, UN 2880, is not a prohibited material or subject to temperature control requirements under the provisions of the International Maritime Dangerous Goods (IMDG) Code. Under both the HMR and the IMDG Code, calcium hypochlorite, hydrated, UN 2880, is subject to stowage provisions that require it to be stowed away from heat.

I hope this information is helpful. Please let me know if you have questions or require additional information.

Sincerely,

Edward T. Mazzullo

Edward T. Mazzullo
Director, Office of Hazardous
Materials Standards

GORDON W. ROUSSEAU

5448 Solway Drive
Melbourne Beach, FL 32951
Tel. No. 321-951-3220
Fax No. 413-622-7627

February 23, 2004

Edward T. Mazzullo, Director
Office of Hazardous Materials Standards
Research and Special Projects Administration
U.S. Department of Transportation
Washington, DC 20590

Re: Authorized Transportation of Calcium Hypochlorite Hydrated (UN2880) Pursuant to 49 C.F.R. Subchapter C

Dear Mr. Mazzullo:

I am writing on behalf of PPG Industries, Inc. (PPG). As discussed, PPG has long understood that the transportation of UN2880 in 300 and 425 lb. fiber drums is authorized under the provisions of 49 C.F.R. Subchapter C. I should be grateful if you would confirm that PPG's interpretation of the relevant regulatory provisions is correct.

It has been suggested that even though authorized by the package requirements of the Hazardous Materials Table (HMT), 49 CFR § 172.101, the shipment of UN2880 in 300 and 425 lb. drums is nevertheless "forbidden" by § 173.21(f) because the SADT of the product in those drum sizes is less than 50°C. (IMO documentation indicates that this SADT information was known as far back as 1980. According to information before the IMO and DOT it is clear that the critical temperature of the product in these drums is below 50°C. Information PPG previously furnished to DOT confirms the earlier IMO information that the SADT of the product in these drums is between 47°C and 50°C.)

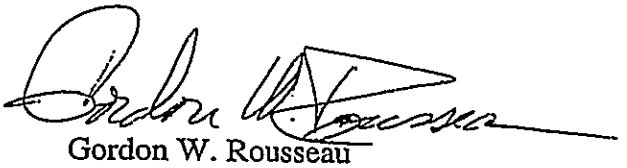
In contrast, it is PPG's understanding based upon its prior meetings with DOT that UN2880 is not forbidden by § 173.21(f) merely because its SADT is less than 50°C. To the contrary, the shipment of UN2880 in these drum sizes is specifically authorized in the HMT because DOT recognizes that UN2880 is safe if shipped in accordance with HMT and IMDG Code requirements. UN2880 has therefore never been listed as a "forbidden" material in the HMT nor as "prohibited" by IMO, and DOT has never supported efforts at the IMO and UN to impose temperature control requirements on UN2880. Indeed, in January 2000, DOT specifically opposed proposals to amend the IMDG Code to impose temperature control requirements on UN2880. Additionally, in July 2002, DOT did not support proposals by

Germany and Japan to require temperature controls on UN2880. DOT surely would not have done so if the shipment of UN2880 in 300 and 425 lb. drums were forbidden by § 173.21(f).

Can you therefore please confirm that the shipment of UN2880 in 300 and 425 lb. fiber drums is not "forbidden" simply because the SADT threshold is below 50°C, and that UN2880 is not on account of § 173.21(f) subject to the controlled temperature provisions in 49 C.F.R. or the IMDG Code?

Thank you for your assistance.

Very truly yours,



Gordon W. Rousseau