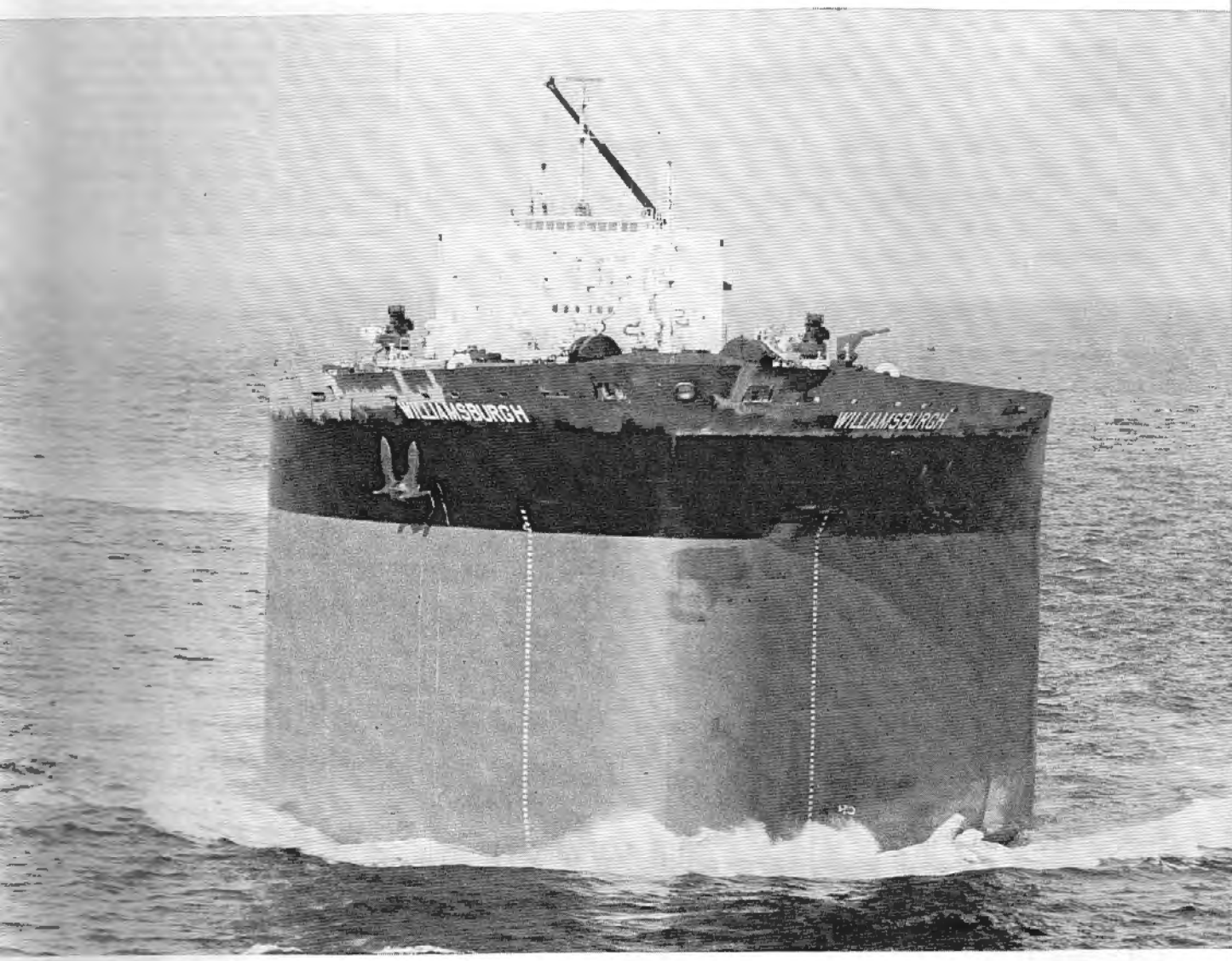
PROCEEDINGS
OF THE MARINE SAFETY COUNCIL



DEPARTMENT OF TRANSPORTATION UNITED STATES COAST GUARD

Vol. 32, No. 2 CG–129 February 1975

PROCEEDINGS

OF THE

MARINE SAFETY COUNCIL

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FRONT COVER

Riding high in the water on sea trials is the recently christened VLCC *Williamsburgh*. The 225,000 d.w.t. tanker was built by the Seatrain Shipbuilding Corporation.

BACK COVER

The *Western Pacesetter III* is shown on sea trials in the Gulf of Mexico. Capable of drilling in water depths of 1,200 feet, the semi-submersible rig was built by Avondale Shipyards, Inc.

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A: abcde(2), fhklmntuv(1)
B: n(40); c(6); e(5); f(4); ghj(3); r(2); bkipq(1)
C: egmp(1)
D: i(5); adfgklm(1)
E: mn(1)
F: kp(1)
Lists TCG–06, CG–13, CG–20

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Lieutenant (jg) G. D. Szczerek, Editor

The 1973 Marine Pollution Convention's Impact on Ships Transporting Hazardous Materials

By Robert J. Lakey, Technical Advisor, Office of Merchant Marine Safety, U.S. Coast Guard

The following paper was presented at the 1974 National Conference on Control of Hazardous Material Spills. The Conference, held in San Francisco, California, was co-sponsored by the Environmental Protection Agency and the American Institute of Chemical Engineers. Any opinions expressed in this paper are those of the author and not necessarily those of the U.S. Coast Guard.

Introduction

In October 1973, the United States along with 70 other nations met in London, England under the auspices of the Intergovernmental Maritime Consultative Organization (IMCO), and adopted the International Convention for the Prevention of Pollution from Ships, 1973. When ratified, this new Convention will regulate discharge of oil, noxious chemicals, sewage and garbage into the sea. While efforts to control oil pollution from ships internationally go back a very long way, the 1973 Convention is the first international effort to control the intentional and accidental pollution from ships that transport hazardous materials.

The main objective of the London Conference, at which the new Convention was negotiated was ". . . the achievement by 1975 if possible, but certainly by the end of the decade, the complete elimination of the willful and intentional pollution of the seas by oil and noxious substances other than oil, and the minimization of accidental spills. . . ." [IMCO Assembly Resolution A.237 (VII)]. The 1973 Convention substantially fulfills this objective. (1) (2) (3)

To put the 1973 Convention into perspective, it should be viewed as one of a series of international agreements concerning the protection of the marine environment which has been developed since 1969. These agreements include: the 1969 Intervention Convention; the 1969 Civil Liability Convention; the 1971 Compensation Fund Convention, and the 1972 Ocean Dumping Convention as well as the 1973 Protocol which extended the Intervention Convention to include hazardous materials.

TABLE 1

International Convention for the Prevention of Pollution From Ships, 1973

Preamble

Article

1. General Obligation Under the Convention
2. Definitions
3. Application
4. Violation
5. Certificates and Special Rules on Inspection of Ships
6. Detection of Violations and Enforcement of the Convention
7. Undue Delay of Ships
8. Reports of Incidents Involving Harmful Substances
9. Other Treaties and Interpretation
10. Settlement of Disputes
11. Communication of Information
12. Casualties to Ships
13. Signature, Ratification, Acceptance, Approval and Accession
14. Optional Annexes
15. Entry Into Force
16. Amendments
17. Promotion of Technical Co-operation
18. Denunciation
19. Deposit and Registration
20. Languages

Annex I—Regulations for the Prevention of Pollution by Oil

Annex II—Regulations for the Control of Pollution by Noxious Substances in Bulk

Annex III—Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Forms or in Freight Containers, Portable Tanks or Road and Rail Tank Wagons

Annex IV—Regulations for the Prevention of Pollution by Sewage From Ships

Annex V—Regulations for the Prevention of Pollution by Garbage From Ships

The Convention contains two main sections; the first contains the Articles of the Convention, and the second section contains five technical annexes. The outline of the Convention is shown in Table 1. As is noted in Table 1, the Articles contain the basic legal and administrative provisions of the Convention. The Annexes, on the other hand, contain the technical regulations for controlling pollution (discharge) from ships.

The Convention comes into force 12 months after 15 states representing at least 50 percent of the gross tonnage of the world's merchant shipping have become parties to it. Annexes I and II are mandatory annexes; they must be accepted by a state without reservation of any kind when it becomes a party to the Convention. Annexes III, IV and V are known as "optional annexes."

A state, at the time of becoming a party to the Convention, may declare that it does not accept any one or all of the Annexes III, IV, V. An optional annex would come into force 12 months after the above mentioned conditions have been fulfilled for that annex, and would operate only between those nations accepting the annex.

Annex II

The transportation of hazardous materials in bulk impacts or threatens the marine environment in two ways: first through the intentional discharge of tank washings and second through the accidental discharge of cargo following a casualty. Prior to the 1973 Convention there were no internationally accepted regulations controlling the *intentional* discharge; IMCO had, however, begun addressing the problem of minimizing *accidental* pollution by developing a recommended code for the construction and equipment of ships carrying dangerous chemicals in bulk, [IMCO Resolution A.212(VII)]. It is the purpose of Annex II to provide the international regulations and controls needed to limit intentional discharges and to set minimum vessel standards that would limit accidental discharges.

Regarding controlling intentional pollution, the Annex follows a three step process. First, the substances are evaluated and categorized according to their hazard. Second, discharge regulations (limits) are prescribed depending upon the category; and third, control procedures to ensure compliance are provided.

Hazard Evaluations and Categorization

During the pre-conference preparations at IMCO, it was recognized that an internationally agreed hazard evaluation system would be essential if the desire to set international pollution control standards for noxious substances were to be successful. The Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP), a group sponsored by several UN agencies, developed, at the request of IMCO, the needed hazard evaluation system. This system (4) evaluates substances in each of the following five areas:

(1) bioaccumulation
(2) damage to living resources
(3) hazard to human health (oral intake)
(4) hazard to human health (skin contact & inhalation)
(5) reduction of amenities.

The GESAMP System was used at the London Conference to evaluate and categorize the substances along the agreed guidelines shown in Table II.

TABLE II

Category A: Substances which are bioaccumulated and liable to produce a hazard to aquatic life or human health; or which are highly toxic to aquatic life (as expressed by a Hazard Rating 4, defined by a TLm less than 1 ppm); and additionally certain substances which are moderately toxic to aquatic life (as expressed by a Hazard Rating, defined by a TLm of 1 or more, but less than 10 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category B: Substances which are bioaccumulated with a short retention of the order of one week or less; or which are liable to produce tainting of the sea food; or which are moderately toxic to aquatic life (as expressed by a Hazard Rating 3, defined by a TLm of 1 ppm or more, but less than 10 ppm); and additionally certain substances which are slightly toxic to aquatic life (as expressed by a Hazard Rating 2, defined by a TLm of 10 ppm or more, but less than 100 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category C: Substances which are slightly toxic to aquatic life (as expressed by a Hazard Rating 2, defined by a TLm of 10 or more, but less than 100 ppm); and additionally certain substances which are practically non-toxic to aquatic life (as expressed by a Hazard Rating 1, defined by a TLm of 100 ppm or more, but less than 1,000 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category D: Substances which are practically non-toxic to aquatic life (as expressed by a Hazard Rating 1, defined by a TLm of 100 ppm or more, but less than 1,000 ppm); or causing deposits blanketing the seafloor with a high biochemical oxygen demand (BOD); or highly hazardous to human health, with an LD_{50} of less than 5 mg/kg; or produce moderate reduction of amenities because of persistency, smell or poisonous or irritant characteristics, possibly interfering with use of beaches; or moderately hazardous to human health, with an LD_{50} of 5 mg/kg or more, but less than 50 mg/kg and produce slight reduction of amenities.

The Hazard Rating used in the guidelines refers to the GESAMP hazard evaluation rating. Appendix I contains a listing of the substances contained in the Annex along with their appropriate category.

Discharge Regulation

The discharge of the substances is controlled in the following manner:

Category A

The discharge of category A substances, or mixtures containing category A substances, is prohibited unless the following conditions are fulfilled:

(a) Tanks are washed, and the resulting diluted residue must be discharged to a reception facility until the concentration of the substance in the effluent has been reduced to a predetermined residual concentration. The tank must then be emptied as far as practical to the reception facility. The residual concentration is normally 0.1 percent by weight.

(b) If the tank is to be further washed a quantity of water equal to at least 5 percent of the total tank volume must be added to any residue remaining from the tank washing and this mixture may then be discharged into the sea provided:

(1) the ship is proceeding en route at a speed of at least 7 knots, (4 knots for barges);

(2) the discharge is made below the waterline; and

(3) the discharge is at least 12 miles from the nearest land in a depth of water of at least 25 meters.

Category B

The discharge of category B substances, or mixtures containing category B substances, is prohibited unless all the following conditions are fulfilled:

(a) the ship is proceeding enroute at a speed of at least 7 knots (4 knots for barges);

(b) the procedures and arrangements for discharge are approved by the Administration. Such procedures and arrangements must be based upon standards developed by IMCO and must ensure that the concentration and rate of discharge is such that the concentration of the substance in the wake astern of the ship does not exceed 1 part per million;

(c) the maximum quantity discharged does not exceed the greater of 1 m^3 or 1/3000 of the tank capacity;

(d) the discharge is below the waterline

(e) the discharge is made at least 12 miles from land and in a depth of water of at least 25 meters.

Category C

The regulations for discharging category C substances are the same as for category B except the concentration permitted in the wake is increased to 10 parts per million and the maximum quantity increased to 3m^3 or 1/1000 of the tank volume.

Category D

For a category D substance, the ship must be enroute at a speed of at least 7 knots, the discharge must occur at least 12 miles from the nearest land and the mixture discharged must be of a concentration not greater than one part of the substance in 10 parts of water. As an alternative to the discharge regulations the annex recognizes a ventilation procedure for cleaning tanks.

For chemical tankers which operate in two recognized special areas, the Baltic or the Black Sea, the discharge regulations become more restrictive. For example, the residual concentration for Category A substances in most locations is 0.1 percent by weight. Inside the special area the prescribed residual concentration is 0.05 percent by weight.

The regulations were developed to prohibit insofar as is practical, the discharge of category A substances into the sea while recognizing that it is virtually impossible to remove all traces of a substance from a ship's cargo tank. Insofar as Category B and C substances are concerned, the regulations were designed to severely restrict the amount of product that may be discharged into the sea and take advantage of the mixing action of a ship's screw to reduce the concentration of permitted discharges to well below the threshold level. The discharge regulations are supported by studies conducted in the United States (5), Norway (6) and the Netherlands (7).

Measures of Control

The Annex includes a control mechanism to ensure compliance with the regulations by providing for the use of surveyors and requiring that a cargo record book be carried aboard the ships. As should be expected, the most severe control measures have been provided for Category A substances.

For category A substances, the washing of the tank must be done in the presence of a surveyor. He must obtain samples, and arrange for them to be analyzed. He must also certify in the cargo record book that the residual concentration has been attained before any discharge into the sea is permitted. Where it is impractical to measure the concentration in the effluent the surveyor must certify that a pre-arranged and approved tank cleaning process has been followed and the tank washings have been discharged to a reception facility. For Category B and C substances, the receiving Administration determines the extent a surveyor is to be used. For example, some receiving Administrations may use surveyors to certify in the record book the quantity of slops remaining in a cargo tank prior to vessel departure.

In any event, the Master must maintain for all categories of substances an accurate record in the cargo record book of all operations connected with each cargo tank, indicating loading, unloading, quantities remaining, location of discharges into the sea and other similar activities. Finally, this cargo record book must be available for inspection by all Administrations.

Minimizing Accidental Pollution

As mentioned previously, the regulations formalize the existing IMCO recommendation on chemical tanker design, the IMCO Chemical Code, (8) by requiring parties to the Con-

vention to issue detailed regulations which contain as a minimum all of the Code's provisions. For ships other than chemical tankers similar regulations are envisioned.

The IMCO Chemical Code provides design, construction and operation standards for the safe carriage by sea of dangerous chemicals in bulk. The Code was developed using a philosophy of prescribing minimum containment standards according to the hazards of the cargoes to be carried. At the heart of the Chemical Code is the chapter dealing with "ship types". Three degrees of "ship types" are provided which define the location of the cargo with respect to the ship's side and bottom and the extent to which a ship should be capable of remaining afloat after damage. The assignment of the ship types to the various cargoes takes into account the hazard of the product.

The highest standard, ship Type I, is required for those substances considered to have the greatest hazard, *i.e.*, those products which on release would have far reaching effects beyond the immediate neighborhood of the vessel. Ship Type I requires the cargo tank to be located inboard from the side of the vessel a distance equal to one-fifth of the beam, and above the bottom a distance of one-fifteenth of the beam. The ship must also meet at least a two-compartment standard of subdivision and damage stability when subjected to certain prescribed damages. Ship Types II and III are required for products with lesser hazards.

As the IMCO Chemical Code was initially developed around "port safety" it must now be reviewed and modified from the "pollution prevention" point of view. Preliminary work in IMCO indicates that more attention is needed to prevent accidental spillage during transfer operations. Further, it is expected that the ship type assignment for some cargoes may be more severe when the pollution hazard is taken into account. Annex II of the 1973 Convention also contains many other important regulations but the above mentioned portions deal with the main thrust of the Annex.

Annex III contains regulations for the prevention of pollution by harmful substances carried on the sea in package and other similar forms. These regulations establish general requirements for packaging, marking and labeling, stowage, quantity limitations and notification. Parties to the Convention must issue detailed requirements to supplement these provisions. Further, by Conference Resolution, IMCO is to continue working on this Annex, incorporating more detailed requirements, if warranted, into the Intergovernmental Maritime Dangerous Goods Code.

It should be noted that at the Conference there was detailed discussion over whether or not there was sufficient information available on transportation of harmful substances in packages, to warrant an annex at that time. Ultimately, it was decided to include the general requirements mentioned above and call by Resolution for the more needed detailed investigation to be done by IMCO.

Future Work

The London Conference adopted 26 resolutions, many of which call for more detailed work to be done on hazardous materials.

a. The impact of the transportation of solid hazardous materials must be studied; if warranted a separate annex is to be developed.

b. A code for the Design and Construction of Liquified Gas Tankers is needed (work is presently underway within IMCO on such a Code, and it should be completed later this year).

c. Many more substances must be evaluated using the GESAMP system and incorporated in Annex II.

d. Procedures for discharging chemicals in accordance with Annex II must be developed.

e. The IMCO Chemical Code must be reviewed.

To accomplish the above, IMCO has created a new Marine Environment Protection Committee. All of the above items are on its "action" plan and many of the items mentioned are already being considered.

Within the United States the ratification process has been set into motion. The annexes are being carefully studied and their implementation planned.

The Impact

The principal impact on ships will result because of the necessity to change. Prior to the 1973 Convention the discharge of tank washing from chemical tankers was not controlled. From the studies done prior to the Conference it was determined that approximately 10,000 tons of hazardous material were discharged annually into the marine environment—often in the more ecologically sensitive areas close to shore. While the tonnage discharge may not change significantly, the regulations will severely limit the amount of the most hazardous substances that may be discharged into the sea and require that any permitted discharge occur well away from land and be in a manner to ensure the resulting concentration is below the threshold limit. Therefore, the major impact is expected to be on chemical tanker operation. The impact will also carry through to the shore, as reception facilities must now be provided to take category A tank washings. Reception facilities will also be needed for the other categories, especially in ship repair ports and at other locations, to receive excessive amounts of product remaining in a cargo tank.

The impact of Annex II on our marine environment is aimed at lessening the threat of its continued deterioration. Annex II should represent the first step; we know that discharges from ships amount to only a fraction of the total amount of chemicals reaching the sea each day. However, it will be only a tiny step if it does not serve as the challenge for action in controlling other sources of chemical pollution.

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Appendix 1—See box on page 24.

*Asterisk indicates that the substance has been provisionally included in this list and that further data are necessary in order to complete the evaluation of its environmental hazards, particularly in relation to living resources.

Substance	UN Number	Pollution Category for operational discharge (Regulation 3 of Annex II)	Residual concentration (per cent by weight) (Regulation 5(1) of Annex II) Outside special areas	Residual concentration (per cent by weight) (Regulation 5(7) of Annex II) Within special areas
	I	II	III	IV
Acetaldehyde	1089	C	.....	.....
Acetic acid	1842	C	.....	.....
Acetic anhydride	1715	C	.....	.....
Acetoue	1090	D	.....	.....
Acetone cyanohydrin	1541	A	0.1	0.05
Acetyl chloride	1717	C	.....	.....
Acrolein	1092	A	0.1	0.05
Acrylic acid*	.....	C	.....	.....
Acrylonitrile	1093	B	.....	.....
Adiponitrile	.....	D	.....	.....
Alkylbenzene sulfonate	.....	.....	.....	.....
(straight chain)	.....	C	.....	.....
(branched chain)	.....	B	.....	.....
Allyl alcohol	1098	B	.....	.....
Allyl chloride	1100	C	.....	.....
Alum (15% solution)	.....	D	.....	.....
Aminoethylethanolamine (Hydroxyethylethylenediamine)*	.....	D	.....	.....
Ammonia (28% aqueous)	1005	B	.....	.....
iso-Amyl acetate	1104	C	.....	.....
n-Amyl acetate	1104	C	.....	.....
n-Amyl alcohol	.....	D	.....	.....
Aniline	1547	C	.....	.....
Benzene	1114	C	.....	.....
Benzyl alcohol	.....	D	.....	.....
Benzyl chloride	1738	B	.....	.....
n-Bntyl acetate	1123	D	.....	.....
sec-Butyl acetate	1124	D	.....	.....
n-Bntyl acrylate	.....	D	.....	.....
Butyl butyrate*	.....	B	.....	.....
Butylene glycol(s)	.....	D	.....	.....
Butyl methacrylate	.....	D	.....	.....
n-Bntyraldehyde	1129	B	.....	.....
Butyric acid	.....	B	.....	.....
Calcium hydroxide (soluuon)	.....	D	.....	.....
Camphor oil	1130	B	.....	.....
Carbon disulphide	1131	A	0.01	0.005
Carbon tetrachloride	1846	B	.....	.....
Caustic potash (Potassium hydroxide)	1814	C	.....	.....
Chloroaceuic acid	1750	C	.....	.....
Chloroform	1888	B	.....	.....
Chlorohydrins (crude)*	.....	D	.....	.....
Chloroprene*	1991	C	.....	.....
Chlorosulphonic acid	1754	C	.....	.....
para-Chlorotoluene	.....	B	.....	.....
Citric acid (10%–25%)	.....	D	.....	.....
Creosote	1334	A	0.1	0.05
Cresols	2076	A	0.1	0.05
Cresylic acid	2022	A	0.1	0.05

Substance	UN Number	Pollution Category for operational discharge (Regulation 3 of Annex II)	Residual concentration (per cent by weight) Regulation 5(1) of Annex II) Outside special areas	Residual concentration (per cent by weight) (Regulation 5(7) of Annex II) Within special areas
	I	II	III	IV
Crotonaldehyde	1143	B		
Cumene	1918	C		
Cyclohexane	1145	C		
Cyclohexanol		D		
Cyclohexanone	1915	D		
Cyclohexylamine*		D		
para-Cymene (Isopropyltoluene)*	2046	D		
Decahydronaphthalene	1147	D		
Decane*		D		
Diacetone alcohol*	1148	D		
Dibenzyl ether*		C		
Dichlorobenzenes	1591	A	0.1	0.05
Dichloroethyl ether	1916	B		
Dichloropropene-Dichloropropane mixture (D.D. Soil fumigant)	2047	B		
Diethylamine	1154	C		
Diethylbenzene (mixed isomers)	2049	C		
Diethyl ether	1155	D		
Diethylenetriamine*	2079	C		
Diethylene glycol monoethyl ether		C		
Diethylketone (3-Pentanone)	1156	D		
Diisobutylene*	2050	D		
Diisobutyl ketone	1157	D		
Diisopropanolamine		C		
Diisopropylamine	1158	C		
Diisopropyl ether*	1159	D		
Dimethylamine (40% aqueous)	1160	C		
Dimethylethanolamine (2-Dimethylaminoethanol)*	2051	C		
Dimethylformamide		D		
1,4-Dioxane*	1165	C		
Diphenyl/Diphenyloxide, mixtures*		D		
Dodecylbenzene		C		
Epichlorohydrin	2023	B		
2-Ethoxyethyl acetate*	1172	D		
Ethyl acetate	1173	D		
Ethyl acrylate	1917	D		
Ethyl amyl ketone*		C		
Ethylbenzene	1175	C		
Ethyl cyclohexane		D		
Ethylene chlorohydrin (2-Chloro-ethanol)	1135	D		
Ethylene cyanohydrin*		D		
Ethylenediamine	1604	C		
Ethylene dibromide	1605	B		
Ethylene dichloride	1184	B		
Ethylene glycol monoethyl ether (Methyl cellosolve)	1171	D		
2-ethylhexyl acrylate*		D		
2-ethylhexyl alcohol		C		
Ethyl lactate*	1192	D		
2-ethyl 3-propylacrolein*		B		
Formaldehyde (37–50% solution)	1198	C		
Formic acid	1779	D		
Furfuryl alcohol		C		
Heptanoic acid*		D		
Hexamethylenediamine*	1783	C		
Hydrochloric acid	1789	D		
Hydrofluoric acid (40% aqueous)	1790	B		
Hydrogen peroxide (greater than 60%)	2015	C		
Isobutyl acrylate		D		
Isobutyl alcohol	1212	D		
Isobutyl methacrylate		D		
Isobutyraldehyde	2045	C		
Isooctane*		D		
Isopentane		D		
Isophorone		D		
Isopropylamine	1221	C		
Isopropyl cyclohexane		D		
Isoprene	1218	D		
Lactic acid		D		
Mesityl oxide*	1229	C		
Methyl acetate	1231	D		
Methyl acrylate	1919	C		
Methylamyl alcohol		D		
2-Ethylhexyl acrylate*		D		
2-Ethylhexyl alcohol		C		
Ethyl lactate*	1192	D		
2-Ethyl 3-propylacrolein*		B		
Formaldehyde (37–50% solution)	1198	C		
Formic acid	1779	D		
Furfuryl alcohol		C		
Heptanoic acid*		D		
Hexamethylenediamine*	1783	C		
Hydrochloric acid	1789	D		
Hydrofluoric acid (40% aqueous)	1790	B		
Hydrogen peroxide (greater than 60%)	2015	C		
Isobutyl acrylate		D		
Isobutyl alcohol	1212	D		

(Continued on page 32)

IMCO Recommendations for Vessel Personnel Handling Hazardous Materials in Bulk

In early 1970 an Intergovernmental Maritime Consultative Organization (IMCO) working group urged that action be taken to strengthen and improve standards of training and professional qualifications of mariners. That recommendation was prompted by the alarming rise in maritime casualties and pollution.

Responding to the working group's report, the Maritime Safety Committee of IMCO established a new Subcommittee on Standards of Watchkeeping and Training in October 1971. The four meetings of this subcommittee since that time have resulted in several documents on the subject of personnel standards and qualifications. These documents were then submitted to the Maritime Safety Committee and finally to the IMCO Assembly for approval and distribution to member governments in the form of Recommendations.

The September and October 1974 issues of the *Proceedings* carried IMCO recommendations on basic principles for maintaining a navigational watch. Reprinted below is a recommendation on training and qualifications for personnel handling hazardous chemicals in bulk.

Materials contained in these and following documents, although of an advisory nature, should be given full attention by interested members of the maritime community. The documents may comprise the workings of an international conference on the subject, tentatively scheduled for 1977. The public will he given ample opportunity to express their views on this important matter. Comments are welcome and may be addressed to Commandant (G–MVP/82), U.S. Coast Guard, Washington, D.C. 20590.

RECOMMENDATION ON TRAINING AND QUALIFICATIONS OF OFFICERS AND CREWS OF SHIPS CARRYING HAZARDOUS OR NOXIOUS CHEMICALS IN BULK

THE ASSEMBLY,

NOTING Article 16(i) of the Convention on the Inter-Governmental Maritime Consultative Organization concerning the functions of the Assembly,

RECOGNIZING the importance and urgency of establishing mandatory minimum requirements for the training of officers and key ratings having special responsibilities for handling hazardous or noxious chemicals in bulk,

HAVING CONSIDERED the Reports of the Maritime Safety Committee on its twenty-seventh and twenty-eighth sessions,

RESOLVES:

(a) to endorse the Recommendation on Training and Qualifications of Officers and Crews of Ships Carrying Hazardous or Noxious Chemicals in Bulk, the text of which is at Annex hereto;

(b) to urge all Member Governments to give effect to the contents of the Recommendation as soon as practicable.

ANNEX

THE MARITIME SAFETY COMMITTEE,

BEING AWARE of the possible dangers to human life aud to the environment from accidents involving the handling and carriage of hazardous or noxious chemicals in bulk,

NOTING that the shipment of these cargoes is rapidly increasing,

RECOGNIZING that suitable arrangements for the mandatory training of officers and key ratings having special responsibility for handling such cargoes are not widely available,

BEING OF THE OPINION that mandatory minimu m requirements should be established as soon as practicable,

RECOMMENDS:

(a) Member Governments to take account of the guidance contained in the Appendix to this recommendation on training and qualification of officers and crews of ships carrying hazardous or noxious chemicals in bulk;

(b) that special training should be given to officers and ratings having special responsibility in connexion with cargo handling and equipment in ships carrying hazardous or noxious chemicals in bulk; and training courses for that purpose should be of adequate duration and supplemented by practical instruction at sea or in a suitable shore-based installation, e.g. bulk chemical handling terminal;

(c) that Member Governments should satisfy themselves as to the standard of competency of officers and ratings having special responsibility in connexion with cargo operations in these ships. An Administration may, for example, require that such officers and ratings shall have undergone special training and have completed some minimum period of service in suitable ships as indicated above. Alternatively, the officer or rating should have completed a substantial period of service in chemical tankers and have satisfied the Administration as to his standard of specialized knowledge;

(d) that all other personnel serving on ships carrying hazardous chemicals in bulk should be given training relevant to their duties.

APPENDIX

1. TRAINING OF OFFICERS AND RATINGS RESPONSIBLE FOR CARGO HANDLING AND EQUIPMENT

It is considered that any training should be divided into two parts, the general part of principles involved and a part dealing with the application of the principles to ship operation. Any of this training may be given at sea or ashore. Such training should be supplemented by practical instruction at sea, and, where appropriate, in a suitable shore-based installation. All training/instruction must be given by a properly qualified person.

A. General

(i) Elementary Physics:	An outline treatment including practical demonstration of the physical properties of chemicals carried in bulk; vapour pressure/temperature relationship. Influence of pressure on boiling temperature. Explanation of: saturated vapour pressure, diffusion, partial pressure, flammability limit, flashpoints and autoignition temperature. Practical significance of flashpoint and low flammable limit. Simple explanation of types of electrostatic charge generation.
(ii) Elementary Chemistry:	Chemical symbols and structures, elements of the chemistry of acids and bases, structure and properties of well-known chemicals carried, chemical reaction of well-known groupings, sufficient to enable proper utilization of Codes.
(iii) Toxicity:	Simple principles and explanation of basic concepts; toxicity limits, systemic poisons and irritants.
(iv) Hazards:	
(a) Explosion and Flammability Hazards:	Flammability limits. Sources of ignition and explosion.
(b) Health Hazards:	Dangers of skin contact, inhalation and ingestion.
(c) Environment Hazards:	Dangers to human and marine life from release of chemicals at sea. Effect of specific gravity and solubility. Danger from vapour cloud drift. Effect of vapour pressure and atmospheric conditions.
(d) Reactivity Hazards:	Self-reaction: polymerization, effects of temperature, impurities as catalysts. Reaction with air, water and other chemicals.
(e) Corrosion Hazards:	Dangers to personnel, attacks on constructional materials. Effects of concentration. Evolution of hydrogen.
(v) Hazard Control:	Inerting, water padding, drying agents, monitoring techniques. Anti-static measures. Ventilation. Segregation. Cargo inhibition. The importance of compatibility of materials.
(vi) Safety Equipment and Protection of Personnel:	The function of measuring instruments and similar equipment. Specialized fire-extinguishing appliances, breathing and escape apparatus. Protective clothing and equipment.

B. Shipboard Application

(i) Regulations and Codes of Practice:	Familiarization with IMCO, National and International Chamber of Shipping Codes Port regulations. The importance of developing ships' emergency plans.
(ii) Ship Design and Equipment of Chemical Tankers:	A brief description of specialized piping, pumping and tank arrangements, over-flow control. Types of cargo pumps and their application to varinus types of cargo. Tank cleaning and gas freeing systems. Cargo tank venting and accommodation ventilation, air locks. Gauging systems. Tank temperature control systems. The safety factors of electrical systems.
(iii) Ship Operations:	Cargo calculation. Loading and discharging plans. Loading and discharge procedure, check lists, use of monitoring equipment. Gas freeing operations and tank cleaning operations (proper use of absorption and wetting agents and detergents). Use and maintenance of inert atmospheres. Control of entry into pumprooms and enclosed spaces. Use of detecting and safety equipment. Disposal of waste and washings. Precautions to be taken before the repair and maintenance of pumping, piping, electrical and control systems.
(iv) Emergency Operations: (It is recommended that officers should have previously attended a basic fire-fighting course of an approved nature.)	Emergency plan. Emergency shutdown. Action in the event of failure of services essential to cargo. Fire-fighting on chemical tankers. Action following collision and/or spillages. First aid procedure and the use of resuscitation and decontamination equipment.

General Notes

It is recommended that as great a use as possible should be made of films and suitable visual aids, and that the opportunity should be taken to introduce discussion of the part to be played by safety organizations on board ship, and the role of Safety Officers and Safety Committees.

2. TRAINING OF OTHER PERSONNEL

Such personnel should undergo training on board ship and, where appropriate, ashore, which must be given by a qualified person who has attained the required standard and is experienced in the carriage of this type of cargo.

(i) Health Hazard and Prevention:	Dangers of skin contact. Inhalation and swallowing cargo. The toxic properties of cargoes carried. Accidents to personnel and associated first aid. Lists of do's and dont's.
(ii) Fire Prevention/Fire-fighting: (It is recommended that personnel should have attended a basic fire-fighting course of approved nature.)	Outline of portable apparatus and fixed installations. Methods of fire fighting for different chemicals. Fire and explosion prevention. Sources of ignition.
(iii) Pollution and Prevention:	Procedures to be followed to prevent air and water pollution.
(iv) Safety Equipment and its use:	The use of protective clothing and equipment, resuscitators, escape sets, rescue equipment.
(v) Emergency Procedures:	Familiarization with the emergency plan procedure.
(vi) Cargo Equipment and Operations: (selected personnel)	General description of cargo handling equipment. Safe loading and discharge procedure and precautions. Safe entry into enclosed spaces.

maritime sidelights

A radio watchstander hands you the following message which he has received by radiotelephone from an obviously excited sender:

"MAYDAY MAYDAY MAYDAY

(NAME OF SHIP SPOKEN THREE TIMES OR CALL LETTERS SPELLED THREE TIMES)

MAYDAY (NAME OF SHIP OR CALL SIGN OF SHIP)

INTERCO LIMA PANTAFIVE KARTEFOUR BISSOTWO PANTAFIVE NOVEMBER GULF NADAZERO UNAONE SOXISIX TERRATHREE TERRATHREE WHISKEY CHARLIE BRAVO SOXISIX"

The signal is a distress message using the International Code of Signals, H.O. 102, which became effective on April 1, 1969. The procedure for sending distress (Mayday), urgency (PAN) and safety (SECURITE) messages by radiotelephone are contained in Chapter 4 of H.O. 102.

Table I, on Page 138, contains the phonetic alphabet; ALFA, BRAVO, etc. which everyone is familiar with. The figure spelling tables and their pronunciations, also Table I, which are not so well known or identified, are:

NUMERAL 1—UNAONE	NUMERAL 6—SOXISIX
NUMERAL 2—BISSOTWO	NUMERAL 7—SETTESEVEN
NUMERAL 3—TERRATHREE	NUMERAL 8—OKTOEIGHT
NUMERAL 4—KARTEFOUR	NUMERAL 9—NOVENINE
NUMERAL 5—PANTAFIVE	NUMERAL 0—NADAZERO
	DECIMAL —DECIMAL

The above message, outlined on Page 137 as Example 3 means:

"(SHIP) IN DISTRESS POSITION LATITUDE 54 25 NORTH LONGITUDE 016 33 WEST I REQUIRE IMMEDIATE ASSISTANCE I AM ON FIRE."

APPENDIX I

(Continued from page 28.)

Substance	UN Number	Pollution Category for operational discharge (Regulation 3 of Annex II)	Residual concentration (per cent by weight) (Regulation 5(1) of Annex II)	Residual concentration (per cent by weight) (Regulation 5(7) of Annex II)
	I	II	III *Outside special areas*	IV *Within special areas*
Isobutyl methacrylate		D		
Isobutyraldehyde	2045	C		
Isooctane*		D		
Isopentane		D		
Isophorone		D		
Isopropylamine	1221	C		
Isopropyl cyclohexane		D		
Isoprene	1218	D		
Lactic acid		D		
Mesityl oxide*	1229	C		
Methyl acetate	1231	D		
Methyl acrylate	1919	C		
Methylamyl alcohol		D		
Propionaldehyde	1275	D		
Propionic acid	1348	D		
Propionic anhydride		D		
n-Propyl acetate*	1276	C		
n-Propyl alcohol	1274	D		
n-Propylamine	1277	C		
Pyridine	1282	B		
Silicon tetrachloride	1818	D		
Sodium bichromate (solution)		C		
Sodium hydroxide	1824	C		
Sodium pentachlorophenate (solution)		A	0.1	0.05
Styrene monomer	2055	C		
Sulphuric acid	1830/1831/1832	C		
Tallow		D		
Tetraethyl lead	1649	A	0.1	0.05
Tetrahydrofuran	2056	D		
Tetrahydronaphthalene	1540	C		
Tetramethylbenzene		D		
Tetramethyl lead	1649	A	0.1	0.05
Titanium tetrachloride	1838	D		
Toluene	1294	C		
Toluene diisocyanate*	2078	B		
Trichloroethane		C		
Trichloroethylene	1710	B		
Triethanolamine		D		
Triethylamine	1296	C		
Trimethylbenzene*		C		
Tritoyl phosphate (Tricresyl phosphate)*		B		
Turpentine (wood)	1299	B		
Vinyl acetate	1301	C		
Vinylidene chloride*	1303	B		
Xylenes (mixed isomers)	1307	C		

COAST GUARD RULEMAKING

(Status as of 1 January 1975)

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
1972 PUBLIC HEARING							
Tailshaft inspection and drawing (67–71, 4–71)	3–1–72	3–27–72	4–3–72	X			
ANCHORAGE REGULATIONS							
San Juan Harbor, P.R. (CGFR 72–12)	2–1–72		3–4–72		12–3–74		
Juan DeFuca, Wash. (CGD 72–233)	12–5–72		1–9–73			12–3–74	1–1–75
Puget Sound Area, WA (CGD 73–180)	8–24–73		9–28–73			12–3–74	1–1–75
Indian River, Sebastian, FL (CGD 74–104)	7–2–74		8–5–74	X			
Beverly and Salem Harbors, MA (CGD 74–189)	12–18–74		1–20–75				
BRIDGE REGULATIONS							
Sacramento R: et al., CA (CGD 73–142)	5–24–74		7–2–74	X			
Cheesequake Ck., NJ (CGD 73–162)	8–10–73		9–11–73	X			
AIWW, Mile 342, Lauderdale-by-the-Sea, FL (CGD 74–180)	8–7–74		9–6–74	X			
Stony Ck., MD (CGD 73–242)	10–12–73		11–20–73	X			
San Joaquin River, Georgiana Slough, Sacramento River, CA (CGD 73–172)	5–24–74		7–2–74	X			
AIWW, Hillsboro Inlet, FL (CGD 74–22)	1–25–74		3–1–74	X			
Chesapeake & Del. Canal, Del. (CGD 74–72)	3–29–74		4–30–74	X			
New River, FL (CGD 74–114)	4–22–74		5–20–74	X			
Manatee River, FL (CGD 74–101)	4–22–74		5–20–74	X			
Chicago River, IL (CGD 74–137)	6–3–74		7–16–74	X			
Columbia and Snake Rivers, WA (CGD 74–223)	9–20–74		10–22–74	X			
Bayou Little (Petit), Caillou, LA (CGD 74–215)	9–19–74		10–22–74	X			
Vermilion River, LA (CGD 74–214)	9–19–74		10–22–74			12–3–74	1–1–75
Bayou Dularge, LA (CGD 74–234)	10–9–74		11–12–74	X			
Franklin Canal, LA (CGD 74–235)	10–9–74		11–12–74	X			
AIWW, Hallandale, FL (CGD 74–257)	11–5–74		12–5–74	X			
HAZARDOUS MATERIALS							
Dichlorobutene, Corrected, F.R. 9–20–72, Hazardous Cargoes (CGD 72–162PH)	8–30–72	10–24–72	10–31–72			11–15–74	2–13–75
Miscellaneous Dangerous Cargoes (CGD 72–182)	11–11–72	12–12–72	12–29–72	X			
Dangerous Cargo Regulations, miscellaneous (CGD 73–249)	1–16–74		3–4–74	X			
Notice of arrival of laden vessels (CGD 73–253)	6–25–74		8–8–74	X			
Sodium sulfide solution and sulfur dioxide (CGD 73–275)	7–16–74 Corrected 9–5–74		12–5–74	X			
Vinyl chloride (CGD 74–167)	7–23–74	8–15–74	9–6–74	X			
Vinyl chloride, supplementary notice (CGD 74–200)	9–19–74		11–4–74	X			

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
MARINE ENVIRONMENT AND SYSTEMS (GENERAL)							
Marine Sanitation Devices (CGD 73-83)	3-1-74	5-1-74	5-14-74	X			
Boundary Lines of Inland Waters (CGD 73-241)	4-8-74 Corrected 5-8-74		5-26-74	X			
Pipelines, lights to be displayed (CGD 73-216)	9-19-74 Corrected 10-18-74	10-21-74	11-4-74	X			
Control of vessel operations (CGD 73-202)	3-1-74 Supp. Notice 10-24-74	12-5-74	4-19-74 12-13-74	X			
Oil and hazardous substance liability (CGD 73-185)	12-4-74		1-16-75				
MERCHANT MARINE SAFETY (GENERAL)							
Oceanographic vessels, fire main systems (CGFR 72-20)	2-4-72		3-19-72	X			
Ship's Maneuvering Characteristics Data (CGD 72-134PH)	8-22-72 Supp. Notice 7-20-73	9-28-72	10-13-72 8-31-73	X			
Emergency Position Indicating Radio Beacons (CGD 73-24)	3-5-73	4-18-73	4-30-73			3-18-74	3-1-75
Tank vessel electrical installation (CGD 74-118)	8-26-74		10-10-74	X			
Unmanned Platforms (CGD 73-177)	1-8-74 Corrected 1-29-74		2-25-74	X			
Releases, Lifesaving Equipment, Hydraulic and Manual (CGD 73-153)	1-8-74		2-25-74	X			
Bulk Dangerous Cargoes, Inspection of Barges (CGD 73-271)	3-11-74	4-15-74	4-30-74	X			
First Aid Certificates (CGD 73-272)	4-2-74		6-15-74	X			
CO_2 Fixed Fire Extinguishing Systems (CGD 74-100)	5-8-74		6-24-74	X			
Carriage of Solid Hazardous Materials in Bulk (CGD 74-13)	5-15-74	7-16-74	8-31-74	X			
Tank vessels in domestic trade (CGD 74-32)	6-28-74 Corrected 7-23-74	7-23-74 Seattle 7-30-74 Wash. D.C.	8-19-74	X			
Welding and brazing; adoption of ASME Code (CGD 74-102)	9-26-74 Corrected 11-1-74		11-11-74	X			
Load line regulations, rail height adjustment (CGD 74-164)	10-4-74		11-15-74	X			
Construction and equipment of tank vessels (CGD 74-127)	Adv. Notice 9-5-74						
Great Lakes pilotage (CGD 74-233)	11-5-74	11-20-74	11-26-74	X			

NOTE: This table which will be continued in future issues of the Proceedings is designed to provide the maritime public with better information on the status of changes to the Code of Federal Regulations made under authority granted the Coast Guard. Only those proposals which have appeared in the Federal Register as Notices of Proposed Rulemaking, and as rules will be recorded. Proposed changes which have not been placed formally before the public will not be included.

MERCHANT MARINE SAFETY PUBLICATIONS

The following publications of marine safety rules and regulations may be obtained from the nearest marine inspection office of the U.S. Coast Guard.[1] Because changes to the rules and regulations are made from time to time, these publications, between revisions, must be kept current by the individual consulting the latest applicable Federal Register. (Official changes to all Federal rules and regulations are published in the Federal Register, printed daily except Saturday, Sunday, and holidays.) The date of each Coast Guard publication in the table below is indicated in parentheses following its title. The dates of the Federal Registers affecting each publication are noted after the date of each edition.

The Federal Register will be furnished by mail to subscribers, free of postage, for $5.00 per month or $45 per year, payable in advance. The charge for individual copies is 75 cents for each issue, or 75 cents for each group of pages as actually bound. Remit check or money order, made payable to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

CG No.	TITLE OF PUBLICATION
101	Specimen Examinations for Merchant Marine Deck Officers (Chief Mate and Master) (1–1–74).
101–1	Specimen Examinations for Merchant Marine Deck Officers (2d and 3d mate) (10–1–73).
108	Rules and Regulations for Military Explosives and Hazardous Munitions (4–1–72). F.R. 7–21–72, 12–1–72, 11–14–74.
115	Marine Engineering Regulations (6–1–73). F.R. 6–29–73, 3–8–74, 5–30–74, 6–25–74, 8–26–74.
123	Rules and Regulations for Tank Vessels (1–1–73). F.R. 8–24–73, 10–3–73, 10–24–73, 2–28–74, 3–18–74, 5–30–74, 6–25–74.
129	Proceedings of the Marine Safety Council (Monthly).
169	Rules of the Road—International—Inland (8–1–72). F.R. 9–12–72, 3–29–74, 6–3–74, 11–27–74.
172	Rules of the Road—Great Lakes (7–1–72). F.R. 10–6–72, 11–4–72, 1–16–73, 1–29–73, 5–8–73, 3–29–74, 6–3–74, 11–27–74.
174	A Manual for the Safe Handling of Inflammable and Combustible Liquids (3–2–64).
175	Manual for Lifeboatmen, Able Seamen, and Qualified Members of Engine Department (3–1–73).
176	Load Line Regulations (2–1–71). F.R. 10–1–71, 5–10–73, 7–10–74.
182	Specimen Examinations for Merchant Marine Engineer Licenses (7–1–63).
182–1	Specimen Examinations for Merchant Marine Engineer Licenses (2d and 3d Assistant) (10–1–73).
184	Rules of the Road—Western Rivers (8–1–72). F.R. 9–12–72, 5–8–73, 6–27–73, 6–28–73, 3–29–74, 6–3–74, 11–27–74.
190	Equipment List (8–1–72). F.R. 8–9–72, 8–11–72, 8–21–72, 9–14–72, 10–19–72, 11–8–72, 12–5–72, 1–15–73, 2–6–73, 2–26–73, 3–27–73, 4–3–73, 4–26–73, 6–1–73, 8–1–73, 10–5–73, 11–26–73, 1–17–74, 2–28–74, 3–25–74, 4–17–74, 7–2–74, 7–17–74, 9–5–74, 10–22–74.
191	Rules and Regulations for Licensing and Certification of Merchant Marine Personnel (6–1–72). F.R. 12–21–72, 3–2–73, 3–5–73, 5–8–73, 5–11–73, 5–24–73, 8–24–73, 10–24–73, 5–22–74, 9–26–74.
200	Marine Investigation Regulations and Suspension and Revocation Proceedings (5–1–67). F.R. 3–30–68, 4–30–70, 10–20–70, 7–18–72, 4–24–73, 11–26–73, 12–17–73, 9–17–74.
227	Laws Governing Marine Inspection (3–1–65).
239	Security of Vessels and Waterfront Facilities (5–1–74). F.R. 5–15–74, 5–24–74, 8–15–74, 9–5–74, 9–9–74, 12–3–74.
256	Rules and Regulations for Passenger Vessels (5–1–69). F.R. 10–29–69, 2–25–70, 4–30–70, 6–17–70, 10–31–70, 12–30–70, 3–9–72, 7–18–72, 10–4–72, 10–14–72, 12–21–72, 4–10–73, 8–1–73, 10–24–73, 12–5–73, 3–18–74, 5–30–74, 6–25–74, 9–20–74.
257	Rules and Regulations for Cargo and Miscellaneous Vessels (4–1–73). F.R. 6–28–73, 6–29–73, 8–1–73, 10–24–73, 3–18–74, 5–30–74, 6–25–74.
258	Rules and Regulations for Uninspected Vessels (5–1–70). F.R. 1–8–73, 3–28–73, 1–25–74, 3–7–74.
259	Electrical Engineering Regulations (6–1–71). F.R. 3–8–72, 3–9–72, 8–16–72, 8–24–73, 11–29–73.
266	Rules and Regulations for Bulk Grain Cargoes (5–1–68). F.R. 12–4–69.
268	Rules and Regulations for Manning of Vessels (10–1–71). F.R. 1–13–72, 3–2–73.
293	Miscellaneous Electrical Equipment List (7–2–73).
320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (7–1–72). F.R. 7–8–72.
323	Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (9–1–73). F.R. 1–25–74, 3–18–74, 9–20–74.
329	Fire Fighting Manual for Tank Vessels (1–1–74).
439	Bridge-to-Bridge Radiotelephone Communications (12–1–72).

CHANGES PUBLISHED DURING DECEMBER 1974

The following have been modified by Federal Registers:

CG–239, Federal Register of December 3, 1974.

CG–169, 172, & 184, Federal Registers of December 10 & 16, 1974.

[1] Due to the paper shortage, certain publications may be temporarily out of stock. Titles 33 and 46, Code of Federal Regulations may be consulted for rules and regulations.


WESTERN
PACESETTER III