No. 7794

ARGENTINA, AUSTRALIA, BELGIUM, BRAZIL, BULGARIA, etc.


Official texts: English and French.
Registered by the Inter-Governmental Maritime Consultative Organization on 2 June 1965.

ARGENTINE, AUSTRALIE, BELGIQUE, BRÉSIL, BULGARIE, etc.

Convention internationale pour la sauvegarde de la vie humaine en mer, 1960 (avec Règles annexées). Signée à Londres, le 17 juin 1960

Textes officiels anglais et français.
Enregistrée par l'Organisation intergouvernementale consultative de la navigation maritime le 2 juin 1965.
No. 7794. INTERNATIONAL CONVENTION\(^1\) FOR THE SAFETY OF LIFE AT SEA, 1960. SIGNED AT LONDON, ON 17 JUNE 1960

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\(^1\) The International Convention for the Safety of Life at Sea, 1960, was prepared and opened for signature and acceptance on 17 June 1960 by the International Conference on Safety of Life at Sea, 1960, held at London from 17 May to 17 June 1960. The Conference also prepared and approved revised International Regulations for Preventing Collisions at Sea and adopted certain recommendations, the texts of which are annexed to the Final Act of the Conference. The Final Act and the annexed recommendations are published for the purpose of information on pp. 400, 418, and 426 of this volume. The text of the revised International Regulations for Preventing Collisions at Sea is not included in this volume, the said Regulations not having entered into force at the time of registration of the International Convention on the Safety of Life at Sea, 1960. It will be published separately upon the entry into force and registration of these Regulations with the Secretariat.

In accordance with article XI, the Convention came into force on 26 May 1965, twelve months after the date on which more than fifteen States, including seven with not less than one million gross tons of shipping each, had deposited an instrument of acceptance with the Inter-Governmental Maritime Consultative Organization. For the list of States in respect of which the Convention came into force, see p. 388 of this volume.
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The Governments of the Argentine Republic, the Commonwealth of Australia, the Kingdom of Belgium, the United States of Brazil, the People’s Republic of Bulgaria, Cameroun, Canada, the Republic of China, the Republic of Cuba, the Czechoslovak Republic, the Kingdom of Denmark, the Dominican Republic, the Republic of Finland, the French Republic, the Federal Republic of Germany, the Kingdom of Greece, the Hungarian People’s Republic, the Republic of Iceland, the Republic of India, Ireland, the State of Israel, the Italian Republic, Japan, the Republic of Korea, Kuwait, the Republic of Liberia, the United Mexican States, the Kingdom of the Netherlands, New Zealand, the Kingdom of Norway, Pakistan, the Republic of Panama, the Republic of Peru, the Republic of the Philippines, the Polish People’s Republic, the Portuguese Republic, the Spanish State, the Kingdom of Sweden, the Swiss Confederation, the Union of Soviet Socialist Republics, the United Arab Republic, the United Kingdom of Great Britain and Northern Ireland, the United States of America, the Republic of Venezuela, and the Federal People’s Republic of Yugoslavia, being desirous of promoting safety of life at sea by establishing in common agreement uniform principles and rules directed thereto:

Considering that this end may best be achieved by the conclusion of a Convention to replace the International Convention for the Safety of Life at Sea, 1948: ¹

¹ United Nations, Treaty Series, Vol. 164, p. 113; for subsequent actions relating to this Convention, see references in Cumulative Indexes Nos. 2 to 4, as well as Annex A in volumes 419, 466, 470, 486, 531 and 535, and p. 476 of this volume.
Have appointed their Plenipotentiaries, namely:

**The Argentine Republic**
Captain Carlos A. Sanchez Sañudo, Naval Attaché, Argentine Embassy, London.
Mr. Nicolas G. Palacios, National Sub-Director of the Argentine Merchant Navy.

**The Commonwealth of Australia**
Mr. Thomas Norris, Assistant Secretary (Marine), Department of Shipping and Transport.

**The Kingdom of Belgium**
His Excellency M. R. L. van Meerbeke, Belgian Ambassador Extraordinary and Plenipotentiary at London.
Mr. R. E. Vancraeynest, Director of Marine Administration, Ministry of Communications.

**The United States of Brazil**
Rear Admiral Luis Clovis de Oliveira, Deputy Chief of Naval Staff, Brazilian Navy and Representative of Brazilian Merchant Marine Commission.

**The People's Republic of Bulgaria**
His Excellency Mr. Georgi Petrov Zenguilekov, Bulgarian Envoy Extraordinary and Minister Plenipotentiary at London.
Engineer Mr. Petko Dokov Doynov, Chief Engineer of the Department of Sea and Water Transport, Ministry of Transport.

**Cameroun**
Mr. Charlot Saguez, Chief Administrator (Second Class) of the Shipping Administration.

**Canada**
His Excellency the Honourable George A. Drew, High Commissioner for Canada in the United Kingdom.
Mr. Alan Cumyn, Director, Marine Regulations, Department of Transport, Ottawa.

**The Republic of China**
His Excellency Mr. Nan-Ju Wu, Ambassador of the Republic of China to Iran.

**The Republic of Cuba**
No. 7794
The Czechoslovak Republic

His Excellency Mr. Miroslav Galuška, Czechoslovak Ambassador Extraordinary and Plenipotentiary at London.

The Kingdom of Denmark

Mr. Jørgen Worm, Head of Shipping Department, Royal Ministry of Trade.

Mr. Anders Bache, Deputy Head of Section, Royal Ministry of Trade.

The Dominican Republic

His Excellency Señor Dr. Héctor García-Godoy, Dominican Ambassador Extraordinary and Plenipotentiary at London.

The Republic of Finland

Mr. Volmari Särkkä, Chief Ship Surveyor at Board of Navigation.

The French Republic

Mr. Gilbert Grandval, Secretary-General of the Merchant Marine.

The Federal Republic of Germany


Herr Dr. Karl Schubert, Head of Shipping Department, Federal Ministry of Transport.

The Kingdom of Greece

Captain Panayiotis S. Pagonis, R. H. P. C., Director, Ministry of Mercantile Marine.

The Hungarian People's Republic

His Excellency Mr. Béla Szilágyi, Minister of the Hungarian People's Republic at London.

The Republic of Iceland

Mr. Hjálmar R. Bárðarson, Director of Shipping.

Mr. Páll Ragnarsson, Deputy Director of Shipping.

The Republic of India

Mr. R. L. Gupta, Secretary to the Government of India, Ministry of Transport and Communications.

Ireland

Mr. Valentin Iremonger, Counsellor, Embassy of Ireland, London.
The State of Israel
Mr. Izaac Josef Mintz, Legal Adviser, Ministry of Transport and Communications; Lecturer, Hebrew University, Jerusalem.
Mr. Moshe Ofer, First Secretary, Embassy of Israel, London.

The Italian Republic
Dr. Fernando Ghiglia, General Director, Ministry of Merchant Marine, Rome.

Japan
Mr. Toru Nakagawa, Minister Plenipotentiary, Embassy of Japan, London.
Mr. Masao Mizushina, Director, Ship Bureau, Ministry of Transportation.

The Republic of Korea
Mr. Tong Jin Park, Counsellor, Embassy of Korea, London.

Kuwait
Mr. Mohammad Qabazard, Director General, Port of Kuwait.

The Republic of Liberia
His Excellency Geo. T. Brewer, Jr., Liberian Ambassador Extraordinary and Plenipotentiary at London.
The Honourable Edward R. Moore, Assistant Attorney-General of Liberia.
Mr. George Buchanan, Assistant Chief Ship Surveyor, Lloyd's Register of Shipping.
Mr. E. B. McCrohan, Jr., Architect, Marine Engineer and Surveyor.

The United Mexican States

The Kingdom of the Netherlands
Captain C. Moolenburgh, R. N. N. (Retd.), Inspector-General of Shipping.

New Zealand
Mr. William Arthur Fox, Minister of Marine.
Mr. Victor George Boivin, Chief Surveyor of Ships, Marine Department.

The Kingdom of Norway
Captain K. J. Neuberth Wie, Inspector-General of Shipping and Navigation, Royal Ministry of Commerce and Shipping.
Mr. Modolv Hareide, Chief of Division, Royal Ministry of Commerce and Shipping.
Pakistan

His Excellency Lieut.-General Mohammed Yousuf, High Commissioner for Pakistan in the United Kingdom.

The Republic of Panama

Mr. Joel Medina, Chief of Shipping Direction of the Republic of Panama.

The Republic of Peru

His Excellency Señor Dr. Don Ricardo Rivera Schreiber, K. B. E., Peruvian Ambassador Extraordinary and Plenipotentiary at London.

The Republic of the Philippines

Commissioner Eleuterio Capapas, Commissioner of Customs.

Engineer Agustin Mathay, Chief, Hull and Boiler Inspection Division, Bureau of Customs.

Attorney Casimiro Caluag, Chief Legal Counsel, Bureau of Customs.

The Polish People's Republic

Mr. Ludwik Szymanski, Member of the Board of the Ministry of Shipping.

Mr. Wladyslaw Milewski, Director of Polish Shipping Register.

The Portuguese Republic

His Excellency General Adolfo Abranches Pinto, Portuguese Ambassador Extraordinary and Plenipotentiary at London.

Commander Joaquin Carlos Esteves Cardoso, Inspector-General of the Merchant Marine; Naval Architect to the Head Commission on Fisheries.

Lieut.-Commander Antonio J. Belo de Carvalho, Electrical Engineer, Chief Surveyor for Electrical and Radio Installations.

Lieut.-Commander Manuel Antunes da Mota, Hydrographical Engineer, Chief Surveyor for Safety of Navigation.

The Spanish State

The Kingdom of Sweden

Dr. Carl Gösta Widell, Director General of the National Board of Shipping and Navigation.

The Swiss Confederation

His Excellency Mr. Armin Daeniker, Swiss Ambassador Extraordinary and Plenipotentiary at London.

The Union of Soviet Socialist Republics

His Excellency Mr. Alexander A. Soldatov, Ambassador Extraordinary and Plenipotentiary of the Union of Soviet Socialist Republics at London.
Captain Alexander A. Saveliev, Member of the Board of the Ministry of Merchant Marine of the Union of Soviet Socialist Republics.

_The United Arab Republic_
Comm. (Retd.) Adnan Loustan, Deputy Director General, Ports and Lighthouses Administration.

_The United Kingdom of Great Britain and Northern Ireland_
Sir Gilmour Jenkins, K. C. B., K. B. E., M. C.
Mr. Percy Faulkner, C. B., Deputy Secretary, Ministry of Transport.
Mr. Dennis C. Haselgrove, Under Secretary, Ministry of Transport.

_The United States of America_
Admiral Alfred C. Richmond, Commandant of the United States Coast Guard.

Mr. Robert T. Merrill, Chief of the Shipping Division, Department of State.

_The Republic of Venezuela_
His Excellency Dr. Ignacio Iribarren Borges, Venezuelan Ambassador Extraordinary and Plenipotentiary at London.
Capitán de Navio Antonio Picardi, Head of Technical Services and Inspection Division of the Merchant Marine, Ministry of Communications.
Captain Armando de Pedraza Pereira, Naval Attaché, Venezuelan Embassy, London.

_The Federal People’s Republic of Yugoslavia_
Mr. Ljubiša Veselinović, Assistant Secretary of the Federal Council for Transport and Communications.

Who, having communicated their full powers, found in good and due form, have agreed as follows:

**Article I**

(a) The Contracting Governments undertake to give effect to the provisions of the present Convention and of the Regulations annexed thereto,¹ which shall be deemed to constitute an integral part of the present Convention. Every reference to the present Convention implies at the same time a reference to these Regulations.

(b) The Contracting Governments undertake to promulgate all laws, decrees, orders and regulations and to take all other steps which may be necessary to give

¹ See p. 62 of this volume.
the present Convention full and complete effect, so as to ensure that, from the point of view of safety of life, a ship is fit for the service for which it is intended.

\textit{Article II}

The ships to which the present Convention applies are ships registered in countries the Governments of which are Contracting Governments, and ships registered in territories to which the present Convention is extended under Article XIII.

\textit{Article III}

\textbf{LAWS, REGULATIONS}

The Contracting Governments undertake to communicate to and deposit with the Inter-Governmental Maritime Consultative Organization (hereinafter called the Organization):

\begin{itemize}
  \item [(a)] a list of non-governmental agencies which are authorised to act in their behalf in the administration of measures for safety of life at sea for circulation to the Contracting Governments for the information of their officers;
  \item [(b)] the text of laws, decrees, orders and regulations which shall have been promulgated on the various matters within the scope of the present Convention;
  \item [(c)] a sufficient number of specimens of their Certificates issued under the provisions of the present Convention for circulation to the Contracting Governments for the information of their officers.
\end{itemize}

\textit{Article IV}

\textbf{CASES OF \textit{FORCE MAJEURE}}

\begin{itemize}
  \item [(a)] No ship, which is not subject to the provisions of the present Convention at the time of its departure on any voyage, shall become subject to the provisions of the present Convention on account of any deviation from its intended voyage due to stress of weather or any other cause of \textit{force majeure}.
  \item [(b)] Persons who are on board a ship by reason of \textit{force majeure} or in consequence of the obligation laid upon the master to carry shipwrecked or other persons shall not be taken into account for the purpose of ascertaining the application to a ship of any provisions of the present Convention.
\end{itemize}
Article V

Carriage of Persons in Emergency

(a) For the purpose of moving persons from any territory in order to avoid a threat to the security of their lives a Contracting Government may permit the carriage of a larger number of persons in its ships than is otherwise permissible under the present Convention.

(b) Such permission shall not deprive other Contracting Governments of any right of control under the present Convention over such ships which come within their ports.

(c) Notice of any such permission, together with a statement of the circumstances, shall be sent to the Organization by the Contracting Government granting such permission.

Article VI

Suspension in the Case of War

(a) In case of war or other hostilities, a Contracting Government which considers that it is affected, whether as a belligerent or as a neutral, may suspend the operation of the whole or any part of the Regulations annexed hereto. The suspending Government shall immediately give notice of any such suspension to the Organization.

(b) Such suspension shall not deprive other Contracting Governments of any right of control under the present Convention over the ships of the suspending Government when such ships are within their ports.

(c) The suspending Government may at any time terminate such suspension and shall immediately give notice of such termination to the Organization.

(d) The Organization shall notify all Contracting Governments of any suspension or termination under this Article.

Article VII

Prior Treaties and Conventions

(a) As between the Contracting Governments the present Convention replaces and abrogates the International Convention for the Safety of Life at Sea which was signed in London on 10 June 1948.¹

(b) All other treaties, conventions and arrangements relating to safety of life at sea, or matters appertaining thereto, at present in force between Governments

¹ See footnote 1, p. 30 of this volume.

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parties to the present Convention, shall continue to have full and complete effect
during the terms thereof as regards:

(i) ships to which the present Convention does not apply;
(ii) ships to which the present Convention applies, in respect of matters for which
it has not expressly provided.

(c) To the extent, however, that such treaties, conventions or arrangements
conflict with the provisions of the present Convention, the provisions of the present
Convention shall prevail.

(d) All matters which are not expressly provided for in the present Convention
remain subject to the legislation of the Contracting Governments.

Article VIII
Special Rules drawn up by Agreement

When in accordance with the present Convention special rules are drawn up
by agreement between all or some of the Contracting Governments, such rules shall be
communicated to the Organization for circulation to all Contracting Governments.

Article IX
Amendments

(a) (i) The present Convention may be amended by unanimous agreement be-
tween the Contracting Governments.

(ii) Upon the request of any Contracting Government a proposed amendment
shall be communicated by the Organization to all Contracting Governments for con-
sideration and acceptance under this paragraph.

(b) (i) An amendment to the present Convention may be proposed to the Organi-
zation at any time by any Contracting Government and such proposal, if adopted
by a two-thirds majority of the Assembly of the Organization (hereinafter called
the Assembly), upon recommendation adopted by a two-thirds majority of the Mar-
time Safety Committee of the Organization (hereinafter called the Maritime Safety
Committee), shall be communicated by the Organization to all Contracting Govern-
ments for their acceptance.

(ii) Any such recommendation by the Maritime Safety Committee shall be
communicated by the Organization to all Contracting Governments for their con-
sideration at least six months before it is considered by the Assembly.

(c) (i) A conference of Governments to consider amendments to the present
Convention proposed by any Contracting Government shall at any time be convened
by the Organization upon the request of one-third of the Contracting Governments.
(ii) Every amendment adopted by such conference by a two-thirds majority of the Contracting Governments shall be communicated by the Organization to all Contracting Governments for their acceptance.

(d) Any amendment communicated to Contracting Governments for their acceptance under paragraph (b) or (c) of this Article shall come into force for all Contracting Governments, except those which before it comes into force make a declaration that they do not accept the amendment, twelve months after the date on which the amendment is accepted by two-thirds of the Contracting Governments including two-thirds of the Governments represented on the Maritime Safety Committee.

(e) The Assembly, by a two-thirds majority vote, including two-thirds of the Governments represented on the Maritime Safety Committee, and subject to the concurrence of two-thirds of the Contracting Governments to the present Convention, or a conference convened under paragraph (c) of this Article by a two-thirds majority vote, may determine at the time of its adoption that the amendment is of such an important nature that any Contracting Government which makes a declaration under paragraph (d) of this Article and which does not accept the amendment within a period of twelve months after the amendment comes into force, shall, upon the expiry of this period, cease to be a party to the present Convention.

(f) Any amendment to the present Convention made under this Article which relates to the structure of a ship shall apply only to ships the keels of which are laid after the date on which the amendment comes into force.

(g) The Organization shall inform all Contracting Governments of any amendments which come into force under this Article, together with the date on which such amendments shall come into force.

(h) Any acceptance or declaration under this Article shall be made by a notification in writing to the Organization, which shall notify all Contracting Governments of the receipt of the acceptance or declaration.

Article X

Signature and Acceptance

(a) The present Convention shall remain open for signature for one month from this day’s date and shall thereafter remain open for acceptance. Governments of States may become parties to the Convention by:

(i) signature without reservation as to acceptance;
(ii) signature subject to acceptance followed by acceptance; or
(iii) acceptance.
(b) Acceptance shall be effected by the deposit of an instrument with the Organization, which shall inform all Governments that have already accepted the Convention of each acceptance received and of the date of its receipt.

Article XI

Coming into Force

(a) The present Convention shall come into force twelve months after the date on which not less than fifteen acceptances, including seven by countries each with not less than one million gross tons of shipping, have been deposited in accordance with Article X. The Organization shall inform all Governments which have signed or accepted the present Convention of the date on which it comes into force.

(b) Acceptances deposited after the date on which the present Convention comes into force shall take effect three months after the date of their deposit.

Article XII

Denunciation

(a) The present Convention may be denounced by any Contracting Government at any time after the expiry of five years from the date on which the Convention comes into force for that Government.

(b) Denunciation shall be effected by a notification in writing addressed to the Organization which shall notify all the other Contracting Governments of any denunciation received and of the date of its receipt.

(c) A denunciation shall take effect one year, or such longer period as may be specified in the notification after its receipt by the Organization.

Article XIII

Territories

(a) (i) The United Nations in cases where they are the administering authority for a territory or any Contracting Government responsible for the international relations of a territory shall as soon as possible consult with such territory in an endeavour to extend the present Convention to that territory and may at any time by notification in writing given to the Organization declare that the present Convention shall extend to such territory.

(ii) The present Convention shall from the date of the receipt of the notification or from such other date as may be specified in the notification extend to the territory named therein.
(b) (i) The United Nations or any Contracting Government which has made a declaration under paragraph (a) of this Article, at any time after the expiry of a period of five years from the date on which the Convention has been so extended to any territory, may by a notification in writing given to the Organization declare that the present Convention shall cease to extend to any such territory named in the notification.

(ii) The present Convention shall cease to extend to any territory mentioned in such notification one year, or such longer period as may be specified therein, after the date of receipt of the notification by the Organization.

(c) The Organization shall inform all the Contracting Governments of the extension of the present Convention to any territories under paragraph (a) of this Article, and of the termination of any such extension under the provisions of paragraph (b), stating in each case the date from which the present Convention has been or will cease to be so extended.

Article XIV

Registration

(a) The present Convention shall be deposited in the archives of the Organization and the Secretary-General of the Organization shall transmit certified true copies thereof to all Signatory Governments and to all other Governments which accept the present Convention.

(b) As soon as the present Convention comes into force it shall be registered by the Organization with the Secretary-General of the United Nations.

In witness whereof the undersigned Plenipotentiaries have signed the present Convention.

Done in London this seventeenth day of June, 1960, in a single copy in English and French, each text being equally authoritative.

The original texts will be deposited with the Inter-Governmental Maritime Consultative Organization, together with texts in the Russian and Spanish languages which will be translations.
For the Government of the Argentine Republic:

C. A. SANCHEZ SAÑUDO
M. H. CALZOLARI
N. G. PALACIOS
(Subject to acceptance)¹

For the Government of the Commonwealth of Australia:

T. NORRIS
(Subject to acceptance)¹

For the Government of the Kingdom of Belgium:

R. L. VAN MEERBEKE
R. E. VANCRAEYNEST
(Sous réserve d’acceptation)²

For the Government of the United States of Brazil:

LUI S CLOVIS DE OLIVEIRA
(Subject to acceptance)¹

For the Government of the People’s Republic of Bulgaria:

G. ZENGUILEKOV
(Subject to ratification and to the following declaration)

"The Government of the People’s Republic of Bulgaria, noting that the inclusion in the Convention of the provisions of paragraph (b) of Regulation 7 and Regulation 11 of Chapter VIII in the part concerning the procedure for admitting nuclear-powered vessels into foreign ports is not necessary and can impede the exploitation of nuclear-powered vessels and be detrimental to the construction of such vessels, does not consider itself committed to the above-mentioned provisions of the Convention."

¹ Sous réserve d’acceptation.
² Subject to acceptance.

---

¹ [Traduction — Translation] Sous réserve de ratification et de la déclaration ci-après:
Le Gouvernement de la République populaire de Bulgarie, notant que l’inclusion dans la Convention des dispositions de l’alinéa b de la Règle 7 et de la Règle 11 du chapitre VIII concernant la procédure d’admission des navires à propulsion nucléaire dans les ports étrangers n’est pas nécessaire et peut entraver l’exploitation de navires à propulsion nucléaire et nuire à la construction de ces navires, ne se considère pas comme lié par les dispositions susmentionnées de la Convention.

No. 7794
For the Government of Cameroun: Pour le Gouvernement du Cameroun:

CH. SAGUEZ

(Sous réserve d'acceptation) ¹

For the Government of Canada: Pour le Gouvernement du Canada:

George A. Drew
Alan CUMYN

(Subject to ratification) ²

For the Government of the Republic of China: Pour le Gouvernement de la République de Chine:

Wu Nan-ju

(Subject to acceptance) ³

For the Government of the Republic of Cuba: Pour le Gouvernement de la République de Cuba:

For the Government of the Czechoslovak Republic: Pour le Gouvernement de la République tchécoslovaque:

For the Government of the Kingdom of Denmark: Pour le Gouvernement du Royaume du Danemark:

J. Worm
Anders BACHE

(Subject to acceptance) ³

For the Government of the Dominican Republic: Pour le Gouvernement de la République Dominicaine:

Héctor GARCÍA-GODOY

(Subject to acceptance) ³

For the Government of the Republic of Finland: Pour le Gouvernement de la République de Finlande:

Volmari SÄRKKÄ

(Subject to acceptance) ³

¹ Subject to acceptance.
² Sous réserve de ratification.
³ Sous réserve d'acceptation.
For the Government of the French Republic:

G. GRANDVAL
(Sous réserve d’acceptation ultérieure)¹

For the Government of the Federal Republic of Germany:

H. HERWARTH
K. SCHUBERT
(Subject to ratification)²

For the Government of the Kingdom of Greece:

P. PAGONIS
(Subject to acceptance)³

For the Government of the Hungarian People’s Republic:

B. SZILÁGYI
(Subject to ratification and to the following declaration)

“The Government of the Hungarian People’s Republic, noting that the inclusion in the Convention of the provisions of paragraph (b) of Regulation 7 and Regulation 11 of Chapter VIII in the part concerning the procedure for admitting nuclear-powered vessels into foreign ports is not necessary and can impede the exploitation of nuclear-powered vessels and be detrimental to the construction of such vessels, does not consider itself committed to the above-mentioned provisions of the Convention.”⁴

For the Government of the Republic of Iceland:

Hjálmar R. BÁRDARSON
Páll RAGNARSSON
(Subject to acceptance)³

¹ Subject to acceptance.
² Sous réserve de ratification.
³ Sous réserve d’acceptation.
⁴ [Traduction — Translation] Sous réserve de ratification et de la déclaration ci-après :
Le Gouvernement de la République populaire hongroise, notant que l’inclusion dans la Convention des dispositions de l’alinéa b de la Règle 7 et de la Règle 11 du chapitre VIII concernant la procédure d’admission des navires à propulsion nucléaire dans les ports étrangers n’est pas nécessaire et peut entraver l’exploitation de navires à propulsion nucléaire et nuire à la construction de ces navires, ne se considère pas comme lié par les dispositions susmentionnées de la Convention.
For the Government of the Republic of India:  
R. L. GUPTA  
(Subject to acceptance) 1

For the Government of Ireland:  
Valentin IREMONGER  
(Subject to acceptance) 1

For the Government of the State of Israel:  
I. J. MINTZ  
M. OFER  
(Subject to ratification) 2

For the Government of the Italian Republic:  
F. GHIGLIA  
(Subject to acceptance) 1

For the Government of Japan:  
Toru NAKAGAWA  
Masao MIZUSHINA  
(Subject to ratification) 2

For the Government of the Republic of Korea:  
Tong JIN PARK  
(Subject to acceptance) 1

For the Government of Kuwait:  
M. QABAZARD  
(Subject to acceptance) 1

1 Sous réserve d'acceptation.  
2 Sous réserve de ratification.
For the Government of the Republic of Liberia:

Geo. T. Brewer, Jr.
Edw. R. Moore
G. Buchanan
E. B. McCrohan, Jr.

(Subject to approval)\(^1\)

For the Government of the United Mexican States:

(Subject to approval)\(^2\)

For the Government of the Kingdom of the Netherlands:

C. Moolenburgh
E. Smit Fzn

(Subject to acceptance)\(^2\)

For the Government of New Zealand:

V. G. Boivin

(Subject to acceptance)\(^2\)

For the Government of the Kingdom of Norway:

Neuberth Wie
Modolv Hareide

(Subject to acceptance)\(^9\)

For the Government of Pakistan:

Mohammed Yousuf

(Subject to acceptance)\(^2\)

\(^1\) Sous réserve d'approbation.
\(^2\) Sous réserve d'acceptation.

No. 7794
For the Government of the Republic of Panama:  
Pour le Gouvernement de la République du Panama:

J. Medina  
(Subject to acceptance) ¹

For the Government of the Republic of Peru:  
Pour le Gouvernement de la République du Pérou:

Ricardo Rivera Schreiber  
(Subject to acceptance) ¹

For the Government of the Republic of the Philippines:  
Pour le Gouvernement de la République des Philippines:

E. Capapas  
Agustin L. Mathay  
C. Caluag  
(Subject to acceptance) ¹

For the Government of the Polish People's Republic:  
Pour le Gouvernement de la République populaire polonaise:

For the Government of the Portuguese Republic:  
Pour le Gouvernement de la République portugaise:

Adolfo do Amaral Abranches Pinto  
Joaquin Carlos Esteves Cardoso  
António de Jesus Braz Belo de Carvalho  
Manuel Antunes da Mota  
(Subject to acceptance) ¹

For the Government of the Spanish State:  
Pour le Gouvernement de l'État espagnol

For the Government of the Kingdom of Sweden:  
Pour le Gouvernement du Royaume de Suède:

C. G. Widell  
(Subject to acceptance) ¹

¹ Sous réserve d’acceptation.
For the Government of the Swiss Confederation:

Armin DEANIKER
(Subject to acceptance)¹

For the Government of the Union of Soviet Socialist Republics:

A. SOLDATOV
(Subject to ratification)

With reservation:

"The Government of the Union of Soviet Socialist Republics, noting that the inclusion in the Convention of the provisions of paragraph (b) of Regulation 7 and Regulation 11 of Chapter VIII in the part concerning the procedure for admitting nuclear-powered vessels into foreign parts is not necessary and can impede the exploitation of nuclear-powered vessels and be detrimental to the construction of such vessels, does not consider itself committed to the above-mentioned provisions of the Convention."²

For the Government of the United Arab Republic:

A. LOUSTAN
(Subject to acceptance)¹

For the Government of the United Kingdom of Great Britain and Northern Ireland:

Gilmour JENKINS
Percy FAULKNER
Dennis C. HASELGROVE
(Subject to acceptance)¹

¹ Sous réserve d'acceptation.
² [Traduction — Translation] Sous réserve de ratification et avec la réserve ci-après:

Le Gouvernement de l'Union des Républiques socialistes soviétiques, notant que l'inclusion dans la Convention des dispositions de l'alinéa b de la Règle 7 et de la Règle 11 du chapitre VIII concernant la procédure d'admission des navires à propulsion nucléaire dans les ports étrangers n'est pas nécessaire et peut entraver l'exploitation de navires à propulsion nucléaire et nuire à la construction de ces navires, ne se considère pas comme lié par les dispositions susmentionnées de la Convention.
For the Government of the United States of America:

Alfred C. RICHMOND

R. T. MERRILL

(Subject to acceptance)¹

For the Government of the Republic of Venezuela:

Ignacio IRIBARREN BORGES

A. PICARDI

A. DE PEDRAZA

(Subject to acceptance)¹

For the Government of the Federal People's Republic of Yugoslavia:

Ljubiša VESELINOVIĆ

(Subject to acceptance)¹

¹ Sous réserve d’acceptation.
REGULATIONS

CHAPTER I

GENERAL PROVISIONS

Part A

APPLICATION, DEFINITIONS, &c.

Regulation 1

APPLICATION

(a) Unless expressly provided otherwise, the present Regulations apply only to ships engaged on international voyages.

(b) The classes of ships to which each Chapter applies are more precisely defined, and the extent of the application is shown, in each Chapter.

Regulation 2

DEFINITIONS

For the purpose of the present Regulations, unless expressly provided otherwise:

(a) "Regulations" means the Regulations referred to in Article I (a) of the present Convention.¹

(b) "Administration" means the Government of the country in which the ship is registered.

(c) "Approved" means approved by the Administration.

(d) "International voyage" means a voyage from a country to which the present Convention applies to a port outside such country, or conversely; and for this purpose every territory for the international relations of which a Contracting Government is responsible or for which the United Nations are the administering authority is regarded as a separate country.

(e) A passenger is every person other than:

(i) the master and the members of the crew or other persons employed or engaged in any capacity on board a ship on the business of that ship; and

(ii) a child under one year of age.

(f) A passenger ship is a ship which carries more than twelve passengers.

(g) A cargo ship is any ship which is not a passenger ship.

(h) A tanker is a cargo ship constructed or adapted for the carriage in bulk of liquid cargoes of an inflammable nature.

¹ See p. 40 of this volume.
(i) A fishing vessel is a vessel used for catching fish, whales, seals, walrus or other living resources of the sea.

(j) A nuclear ship is a ship provided with a nuclear power plant.

(k) "New ship" means a ship the keel of which is laid on or after the date of coming into force of the present Convention.

(l) "Existing ship" means a ship which is not a new ship.

(m) A mile is 6,080 feet or 1,852 metres.

**Regulation 3**

**EXCEPTIONS**

(a) The present Regulations, unless expressly provided otherwise, do not apply to:

(i) Ships of war and troopships.
(ii) Cargo ships of less than 500 tons gross tonnage.
(iii) Ships not propelled by mechanical means.
(iv) Wooden ships of primitive build, such as dhows, junks, &c.
(v) Pleasure yachts not engaged in trade.
(vi) Fishing vessels.

(b) Except as expressly provided in Chapter V, nothing herein shall apply to ships solely navigating the Great Lakes of North America and the River St. Lawrence as far east as a straight line drawn from Cap des Rosiers to West Point, Anticosti Island and, on the north side of Anticosti Island, the 63rd Meridian.

**Regulation 4**

**EXEMPTIONS**

A ship which is not normally engaged on international voyages but which, in exceptional circumstances, is required to undertake a single international voyage may be exempted by the Administration from any of the requirements of the present Regulations provided that it complies with safety requirements which are adequate in the opinion of the Administration for the voyage which is to be undertaken by the ship.

**Regulation 5**

**EQUIVALENTS**

(a) Where the present Regulations require that a particular fitting, material, appliance or apparatus, or type thereof, shall be fitted or carried in a ship, or that any particular provision shall be made, the Administration may allow any other fitting, material, appliance or apparatus, or type thereof, to be fitted or carried, or any other provision to be made in that ship, if it is satisfied by trial thereof or otherwise that such fitting, material, appliance or apparatus, or type thereof, or provision, is at least as effective as that required by the present Regulations.
(b) Any Administration which so allows, in substitution, a fitting, material, appliance or apparatus, or type thereof, or provision, shall communicate to the Organization particulars thereof together with a report on any trials made and the Organization shall circulate such particulars to other Contracting Governments for the information of their officers.

Part B

SURVEYS AND CERTIFICATES

Regulation 6

INSPECTION AND SURVEY

The inspection and survey of ships, so far as regards the enforcement of the provisions of the present Regulations and the granting of exemptions therefrom, shall be carried out by officers of the country in which the ship is registered, provided that the Government of each country may entrust the inspection and survey either to surveyors nominated for the purpose or to organizations recognised by it. In every case the Government concerned fully guarantees the completeness and efficiency of the inspection and survey.

Regulation 7

INITIAL AND SUBSEQUENT SURVEYS OF PASSENGER SHIPS

(a) A passenger ship shall be subjected to the surveys specified below:
(i) A survey before the ship is put in service.
(ii) A periodical survey once every twelve months.
(iii) Additional surveys, as occasion arises.

(b) The surveys referred to above shall be carried out as follows:
(i) The survey before the ship is put in service shall include a complete inspection of its structure, machinery and equipments, including the outside of the ship's bottom and the inside and outside of the boilers. This survey shall be such as to ensure that the arrangements, material, and scantlings of the structure, boilers and other pressure vessels and their appurtenances, main and auxiliary machinery, electrical installation, radio installation, radiotelegraph installations in motor lifeboats, portable radio apparatus for survival craft, life-saving appliances, fire detecting and extinguishing appliances, pilot ladders and other equipments, fully comply with the requirements of the present Convention, and of the laws, decrees, orders and regulations promulgated as a result thereof by the Administration for ships of the service for which it is intended. The survey shall also be such as to ensure that the workmanship of all parts of the ship and its equipments is in all respects satisfactory, and that the ship is provided with the lights, means of making sound signals and distress
signals as required by the provisions of the present Convention and the International Collision Regulations.¹

(ii) The periodical survey shall include an inspection of the structure, boilers and other pressure vessels, machinery and equipments, including the outside of the ship's bottom. The survey shall be such as to ensure that the ship, as regards the structure, boilers and other pressure vessels and their appurtenances, main and auxiliary machinery, electrical installation, radio installation, radiotelegraph installations in motor lifeboats, portable radio apparatus for survival craft, life-saving appliances, fire detecting and extinguishing appliances, pilot ladders and other equipments, is in satisfactory condition and fit for the service for which it is intended, and that it complies with the requirements of the present Convention, and of the laws, decrees, orders and regulations promulgated as a result thereof by the Administration. The lights and means of making sound signals and the distress signals carried by the ship shall also be subject to the above-mentioned survey for the purpose of ensuring that they comply with the requirements of the present Convention and of the International Collision Regulations.

(iii) A survey either general or partial, according to the circumstances, shall be made every time an accident occurs or a defect is discovered which affects the safety of the ship or the efficiency or completeness of its life-saving appliances or other equipments, or whenever any important repairs or renewals are made. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are in all respects satisfactory, and that the ship complies in all respects with the provisions of the present Convention and of the International Collision Regulations, and of the laws, decrees, orders and regulations promulgated as a result thereof by the Administration.

(c) (i) The laws, decrees, orders and regulations referred to in paragraph (b) of this Regulation shall be in all respects such as to ensure that, from the point of view of safety of life, the ship is fit for the service for which it is intended.

(ii) They shall among other things prescribe the requirements to be observed as to the initial and subsequent hydraulic or other acceptable alternative tests to which the main and auxiliary boilers, connections, steam pipes, high pressure receivers and fuel tanks for internal combustion engines are to be submitted, including the test procedures to be followed and the intervals between two consecutive tests.

¹ See footnote 2, p. 400, and footnote 1, p. 28 of this volume.
Regulation 8

SURVEYS OF LIFE-SAVING APPLIANCES AND OTHER EQUIPMENTS OF CARGO SHIPS

The life-saving appliances, except a radiotelegraph installation in a motor lifeboat or a portable radio apparatus for survival craft, and the fire extinguishing appliances of cargo ships to which Chapters II and III of the present Regulations apply shall be subject to initial and subsequent surveys as provided for passenger ships in Regulation 7 of this Chapter with the substitution of 24 months for 12 months in sub-paragraph (a) (ii) of that Regulation. The fire control plans in new ships and the pilot ladders, lights and means of making sound signals carried by new and existing ships shall be included in the surveys for the purpose of ensuring that they comply fully with the requirements of the present Convention and, where applicable, the International Collision Regulations.

Regulation 9

SURVEYS OF RADIO INSTALLATIONS OF CARGO SHIPS

The radio installations of cargo ships to which Chapter IV of the present Regulations applies and any radiotelegraph installation in a motor lifeboat or portable radio apparatus for survival craft which is carried in compliance with the requirements of Chapter III of the present Regulations shall be subject to initial and subsequent surveys as provided for passenger ships in Regulation 7 of this Chapter.

Regulation 10

SURVEY OF HULL, MACHINERY AND EQUIPMENT OF CARGO SHIPS

The hull, machinery and equipment (other than items in respect of which Cargo Ship Safety Equipment Certificates, Cargo Ship Safety Radiotelegraphy Certificates or Cargo Ship Safety Radiotelephony Certificates are issued) of a cargo ship shall be surveyed on completion and thereafter in such manner and at such intervals as the Administration may consider necessary in order to ensure that their condition is in all respects satisfactory. The survey shall be such as to ensure that the arrangements, material, and scantlings of the structure, boilers and other pressure vessels and their appurtenances, main and auxiliary machinery, electrical installations and other equipments are in all respects satisfactory for the service for which the ship is intended.

Regulation 11

MAINTENANCE OF CONDITIONS AFTER SURVEY

After any survey of the ship under Regulations 7, 8, 9 or 10 has been completed, no change shall be made in the structural arrangements, machinery, equipments, &c. covered by the survey, without the sanction of the Administration.
Regulation 12

**ISSUE OF CERTIFICATES**

(a) (i) A certificate called a Passenger Ship Safety Certificate shall be issued after inspection and survey to a passenger ship which complies with the requirements of Chapters II, III and IV and any other relevant requirements of the present Regulations.

(ii) A certificate called a Cargo Ship Safety Construction Certificate shall be issued after survey to a cargo ship which satisfies the requirements for cargo ships on survey set out in Regulation 10 of this Chapter and complies with the applicable requirements of Chapter II, other than those relating to fire extinguishing appliances and fire control plans.

(iii) A certificate called a Cargo Ship Safety Equipment Certificate shall be issued after inspection to a cargo ship which complies with the relevant requirements of Chapters II and III and any other relevant requirements of the present Regulations.

(iv) A certificate called a Cargo Ship Safety Radiotelegraphy Certificate shall be issued after inspection to a cargo ship, fitted with a radiotelegraph installation, which complies with the requirements of Chapter IV and any other relevant requirements of the present Regulations.

(v) A certificate called a Cargo Ship Safety Radiotelephony Certificate shall be issued after inspection to a cargo ship, fitted with a radiotelephone installation, which complies with the requirements of Chapter IV and any other relevant requirements of the present Regulations.

(vi) When an exemption is granted to a ship under and in accordance with the provisions of the present Regulations, a certificate called an Exemption Certificate shall be issued in addition to the certificates prescribed in this paragraph.

(vii) Passenger Ship Safety Certificates, Cargo Ship Safety Construction Certificates, Cargo Ship Safety Equipment Certificates, Cargo Ship Safety Radiotelegraphy Certificates, Cargo Ship Safety Radiotelephony Certificates and Exemption Certificates shall be issued either by the Administration or by any person or organization duly authorised by it. In every case, that Administration assumes full responsibility for the Certificate.

(b) Notwithstanding any other provision of the present Convention any certificate issued under, and in accordance with, the provisions of the International Convention for the Safety of Life at Sea, 1948,¹ which is current when the present Convention comes into force in respect of the Administration by which the certificate is issued, shall remain valid until it expires under the terms of Regulation 13 of Chapter I of that Convention.

(c) A Contracting Government shall not issue Certificates under, and in accordance with, the provisions of the International Convention for the Safety of Life at Sea, 1948

¹ See footnote 1, p. 30 of this volume.
or 1929, after the date on which acceptance of the present Convention by the Government takes effect.

Regulation 13

**ISSUE OF CERTIFICATE BY ANOTHER GOVERNMENT**

A Contracting Government may, at the request of the Administration, cause a ship to be surveyed and, if satisfied that the requirements of the present Regulations are complied with, shall issue certificates to the ship in accordance with the present Regulations. Any certificate so issued must contain a statement to the effect that it has been issued at the request of the Government of the country in which the ship is or will be registered, and it shall have the same force and receive the same recognition as a certificate issued under Regulation 12 of this Chapter.

Regulation 14

**DURATION OF CERTIFICATES**

(a) Certificates other than Cargo Ship Safety Construction Certificates, Cargo Ship Safety Equipment Certificates and Exemption Certificates shall be issued for a period of not more than 12 months. Cargo Ship Safety Equipment Certificates shall be issued for a period of not more than 24 months. Exemption Certificates shall not be valid for longer than the period of the certificates to which they refer.

(b) If a survey takes place within two months before the end of the period for which a Cargo Ship Safety Radiotelegraphy Certificate or a Cargo Ship Safety Radiotelephony Certificate issued in respect of cargo ships of 300 tons gross tonnage and upwards, but less than 500 tons gross tonnage, was originally issued, that certificate may be withdrawn, and a new certificate may be issued which shall expire 12 months after the end of the said period.

(c) If a ship at the time when its certificate expires is not in a port of the country in which it is registered, the certificate may be extended by the Administration, but such extension shall be granted only for the purpose of allowing the ship to complete its voyage to the country in which it is registered or to be surveyed, and then only in cases where it appears proper and reasonable so to do.

(d) No certificate shall be thus extended for a longer period than five months, and a ship to which such extension is granted shall not, on its arrival in the country in which it is registered or the port in which it is to be surveyed, be entitled by virtue of such extension to leave that port or country without having obtained a new certificate.

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(e) A certificate which has not been extended under the foregoing provisions of this Regulation may be extended by the Administration for a period of grace of up to one month from the date of expiry stated on it.

**Regulation 15**

**FORM OF CERTIFICATES**

(a) All certificates shall be drawn up in the official language or languages of the country by which they are issued.

(b) The form of the certificates shall be that of the models given in the Appendix to the present Regulations. The arrangement of the printed part of the model certificates shall be exactly reproduced in the certificates issued, or in certified copies thereof, and the particulars inserted in the certificates issued, or in certified copies thereof, shall be in Roman characters and Arabic figures.

**Regulation 16**

**POSTING UP OF CERTIFICATES**

All certificates or certified copies thereof issued under the present Regulations shall be posted up in a prominent and accessible place in the ship.

**Regulation 17**

**ACCEPTANCE OF CERTIFICATES**

Certificates issued under the authority of a Contracting Government shall be accepted by the other Contracting Governments for all purposes covered by the present Convention. They shall be regarded by the other Contracting Governments as having the same force as certificates issued by them.

**Regulation 18**

**QUALIFICATION OF CERTIFICATES**

(a) If in the course of a particular voyage a ship has on board a number of persons less than the total number stated in the Passenger Ship Safety Certificate and is in consequence, in accordance with the provisions of the present Regulations, free to carry a smaller number of lifeboats and other life-saving appliances than that stated in the Certificate, an annex may be issued by the Government, person, or organization referred to in Regulation 12 or 13.

(b) This annex shall state that in the circumstances there is no infringement of the provisions of the present Regulations. It shall be annexed to the Certificate and shall be substituted for it in so far as the life-saving appliances are concerned. It shall be valid only for the particular voyage for which it is issued.
Regulation 19

CONTROL

Every ship holding a certificate issued under Regulation 12 or Regulation 13 is subject in the ports of the other Contracting Governments to control by officers duly authorised by such Governments in so far as this control is directed towards verifying that there is on board a valid certificate. Such certificate shall be accepted unless there are clear grounds for believing that the condition of the ship or of its equipment does not correspond substantially with the particulars of that certificate. In that case, the officer carrying out the control shall take such steps as will ensure that the ship shall not sail until it can proceed to sea without danger to the passengers or the crew. In the event of this control giving rise to intervention of any kind, the officer carrying out the control shall inform the Consul of the country in which the ship is registered in writing forthwith of all the circumstances in which intervention was deemed to be necessary, and the facts shall be reported to the Organization.

Regulation 20

PRIVILEGES

The privileges of the present Convention may not be claimed in favour of any ship unless it holds appropriate valid certificates.

Part C

CASUALTIES

Regulation 21

CASUALTIES

(a) Each Administration undertakes to conduct an investigation of any casualty occurring to any of its ships subject to the provisions of the present Convention when it judges that such an investigation may assist in determining what changes in the present Regulations might be desirable.

(b) Each Contracting Government undertakes to supply the Organization with pertinent information concerning the findings of such investigations. No reports or recommendations of the Organizations based upon such information shall disclose the identity or nationality of the ships concerned or in any manner fix or imply responsibility upon any ship or person.

CHAPTER II

CONSTRUCTION

Part A

GENERAL

Regulation 1

APPLICATION

(a) (i) Unless expressly provided otherwise, this Chapter applies to new ships.
(ii) In the case of existing passenger ships and cargo ships the keels of which were laid on or after the date of coming into force of the International Convention for the Safety of Life at Sea, 1948, the Administration shall ensure that the requirements which were applied under Chapter II of that Convention to new ships as defined in that Chapter are complied with. In the case of existing passenger ships and cargo ships the keels of which were laid before the date of coming into force of that Convention, the Administration shall ensure that the requirements which were applied under Chapter II of that Convention to existing ships as defined in that Chapter are complied with. As regards those requirements of Chapter II of the present Convention which are not contained in Chapter II of the 1948 Convention the Administration shall decide which of these requirements shall be applied to existing ships as defined in the present Convention.

(b) For the purpose of this Chapter:

(i) A new passenger ship is a passenger ship the keel of which is laid on or after the date of coming into force of the present Convention, or a cargo ship which is converted to a passenger ship on or after that date, all other passenger ships being described as existing passenger ships.

(ii) A new cargo ship is a cargo ship the keel of which is laid on or after the date of coming into force of the present Convention.

(c) The Administration may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of this Chapter unreasonable or unnecessary, exempt from those requirements individual ships or classes of ships belonging to its country which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

(d) In the case of a passenger ship which is permitted under paragraph (c) of Regulation 27 of Chapter III to carry a number of persons on board in excess of the lifeboat capacity provided, it shall comply with the special standards of subdivision set out in paragraph (e) of Regulation 5 of this Chapter, and the associated special provisions regarding permeability in paragraph (d) of Regulation 4 of this Chapter, unless the Administration is satisfied that, having regard to the nature and conditions of the voyage, compliance with the other provisions of the Regulations of this Chapter is sufficient.

(e) In the case of passenger ships which are employed in the carriage of large numbers of unberthed passengers in special trades, such, for example, as the pilgrim trade, the Administration, if satisfied that it is impracticable to enforce compliance with the requirements of this Chapter, may exempt such ships, when they belong to its country, from those requirements on the following conditions:

(i) That the fullest provision which the circumstances of the trade will permit shall be made in the matter of construction.

(ii) That steps shall be taken to formulate general rules which shall be applicable to the particular circumstances of these trades. Such rules shall be formulated in concert
with such other Contracting Governments, if any, as may be directly interested in the carriage of such passengers in such trades.

Notwithstanding any provisions of the present Convention, the Simla Rules, 1931, shall continue in force as between the parties to those Rules until the rules formulated under sub-paragraph (e) (ii) of this Regulation shall come into force.

**Regulation 2**

**Definitions**

For the purpose of this Chapter, unless expressly provided otherwise:

(a) (i) A subdivision loadline is a waterline used in determining the subdivision of the ship.

(ii) The deepest subdivision loadline is the waterline which corresponds to the greatest draught permitted by the subdivision requirements which are applicable.

(b) The length of the ship is the length measured between perpendiculars taken at the extremities of the deepest subdivision loadline.

(c) The breadth of the ship is the extreme width from outside of frame to outside of frame at or below the deepest subdivision loadline.

(d) The draught is the vertical distance from the moulded base line amidships to the subdivision loadline in question.

(e) The bulkhead deck is the uppermost deck up to which the transverse watertight bulkheads are carried.

(f) The margin line is a line drawn at least 3 inches (or 76 millimetres) below the upper surface of the bulkhead deck at side.

(g) The permeability of a space is the percentage of that space which can be occupied by water.

The volume of a space which extends above the margin line shall be measured only to the height of that line.

(h) The machinery space is to be taken as extending from the moulded base line to the margin line and between the extreme main transverse watertight bulkheads bounding the spaces containing the main and auxiliary propelling machinery, boilers serving the needs of propulsion, and all permanent coal bunkers.

In the case of unusual arrangements, the Administration may define the limits of the machinery spaces.

(i) Passenger spaces are those which are provided for the accommodation and use of passengers, excluding baggage, store, provision and mail rooms.

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No. 7794
For the purposes of Regulations 4 and 5 of this Chapter, spaces provided below the margin line for the accommodation and use of the crew shall be regarded as passenger spaces.

(j) In all cases volumes and areas shall be calculated to moulded lines.

Part B

SUBDIVISION AND STABILITY

(Part B applies to passenger ships only, except that Regulation 19 also applies to cargo ships.)

Regulation 3

FLOODABLE LENGTH

(a) The floodable length at any point of the length of a ship shall be determined by a method of calculation which takes into consideration the form, draught and other characteristics of the ship in question.

(b) In a ship with a continuous bulkhead deck, the floodable length at a given point is the maximum portion of the length of the ship, having its centre at the point in question, which can be flooded under the definite assumptions set forth in Regulation 4 of this Chapter without the ship being submerged beyond the margin line.

(c) (i) In the case of a ship not having a continuous bulkhead deck, the floodable length at any point may be determined to an assumed continuous margin line which at no point is less than 3 inches (or 76 millimetres) below the top of the deck (at side) to which the bulkheads concerned and the shell are carried watertight.

(ii) Where a portion of an assumed margin line is appreciably below the deck to which bulkheads are carried, the Administration may permit a limited relaxation in the watertightness of those portions of the bulkheads which are above the margin line and immediately under the higher deck.

Regulation 4

PERMEABILITY

(a) The definite assumptions referred to in Regulation 3 of this Chapter relate to the permeabilities of the spaces below the margin line.

In determining the floodable length, a uniform average permeability shall be used throughout the whole length of each of the following portions of the ship below the margin line:

(i) the machinery space as defined in Regulation 2 of this Chapter;
(ii) the portion forward of the machinery space; and
(iii) the portion abaft the machinery space.
(b) (i) The uniform average permeability throughout the machinery space shall be determined from the formula—

\[ 85 + 10 \left( \frac{a - c}{v} \right) \]

where:

- \( a \) = volume of the passenger spaces, as defined in Regulation 2 of this Chapter, which are situated below the margin line within the limits of the machinery space.
- \( c \) = volume of between deck spaces below the margin line within the limits of the machinery space which are appropriated to cargo, coal or stores.
- \( v \) = whole volume of the machinery space below the margin line.

(ii) Where it is shown to the satisfaction of the Administration that the average permeability as determined by detailed calculation is less than that given by the formula, the detailed calculated value may be used. For the purpose of such calculation, the permeabilities of passenger spaces, as defined in Regulation 2 of this Chapter, shall be taken as 95, that of all cargo, coal and store spaces as 60, and that of double bottom, oil fuel and other tanks at such values as may be approved in each case.

(c) Except as provided in paragraph (d) of this Regulation, the uniform average permeability throughout the portion of the ship before (or abaft) the machinery space shall be determined from the formula—

\[ 63 + 35 \frac{a}{v} \]

where:

- \( a \) = volume of the passenger spaces, as defined in Regulation 2 of this Chapter, which are situated below the margin line, before (or abaft) the machinery space, and
- \( v \) = whole volume of the portion of the ship below the margin line before (or abaft) the machinery space.

(d) In the case of a ship which is permitted under paragraph (c) of Regulation 27 of Chapter III to carry a number of persons on board in excess of the lifeboat capacity provided, and is required under paragraph (d) of Regulation 1 of this Chapter to comply with special provisions, the uniform average permeability throughout the portion of the ship before (or abaft) the machinery space shall be determined from the formula—

\[ 95 - 35 \frac{b}{v} \]

where:

- \( b \) = the volume of the spaces below the margin line and above the tops of floors, inner bottom, or peak tanks, as the case may be, which are appropriated to
and used as cargo spaces, coal or oil fuel bunkers, store rooms, baggage and mail rooms, chain lockers and fresh water tanks, before (or abaft) the machinery space; and

\[ v = \text{whole volume of the portion of the ship below the margin line before (or abaft) the machinery space.} \]

In the case of ships engaged on services where the cargo holds are not generally occupied by any substantial quantities of cargo, no part of the cargo spaces is to be included in calculating "b".

(e) In the case of unusual arrangements the Administration may allow, or require, a detailed calculation of average permeability for the portions before or abaft the machinery space. For the purpose of such calculation, the permeability of passenger spaces as defined in Regulation 2 of this Chapter shall be taken as 95, that of spaces containing machinery as 85, that of all cargo, coal and store spaces as 60, and that of double bottom, oil fuel and other tanks at such value as may be approved in each case.

(f) Where a between deck compartment between two watertight transverse bulkheads contains any passenger or crew space, the whole of that compartment, less any space completely enclosed within permanent steel bulkheads and appropriated to other purposes, shall be regarded as passenger space. Where, however, the passenger or crew space in question is completely enclosed within permanent steel bulkheads, only the space so enclosed need be considered as passenger space.

Regulation 5

Permissible Length of Compartments

(a) Ships shall be as efficiently subdivided as is possible having regard to the nature of the service for which they are intended. The degree of subdivision shall vary with the length of the ship and with the service, in such manner that the highest degree of subdivision corresponds with the ships of greatest length, primarily engaged in the carriage of passengers.

(b) Factor of Subdivision.—The maximum permissible length of a compartment having its centre at any point in the ship’s length is obtained from the floodable length by multiplying the latter by an appropriate factor called the factor of subdivision.

The factor of subdivision shall depend on the length of the ship, and for a given length shall vary according to the nature of the service for which the ship is intended. It shall decrease in a regular and continuous manner—

(i) as the length of the ship increases,
from a factor A, applicable to ships primarily engaged in the carriage of cargo, to a factor B, applicable to ships primarily engaged in the carriage of passengers.

The variations of the factors A and B shall be expressed by the following formulae (I) and (II) where \( L \) is the length of the ship as defined in Regulation 2 of this Chapter:

\[
\text{L in feet} \\
A = \frac{190}{L - 198} + 0.18 \quad (L = 430 \text{ and upwards})
\]

\[
\text{L in metres} \\
A = \frac{58.2}{L - 60} + 0.18 \quad (L = 131 \text{ and upwards}) \quad \cdots \cdots \cdots \cdots \quad (I)
\]

\[
\text{L in feet} \\
B = \frac{100}{L - 138} + 0.18 \quad (L = 260 \text{ and upwards})
\]

\[
\text{L in metres} \\
B = \frac{30.3}{L - 42} + 0.18 \quad (L = 79 \text{ and upwards}) \quad \cdots \cdots \cdots \cdots \quad (II)
\]

(c) *Criterion of Service.*—For a ship of given length the appropriate factor of subdivision shall be determined by the Criterion of Service Numeral (hereinafter called the Criterion Numeral) as given by the following formulae (III) and (IV) where:

\[
C_s = \text{the Criterion Numeral;}
\]

\[
L = \text{length of the ship, as defined in Regulation 2 of this Chapter;}
\]

\[
M = \text{the volume of the machinery space, as defined in Regulation 2 of this Chapter; with the addition thereto of the volume of any permanent oil fuel bunkers which may be situated above the inner bottom and before or abaft the machinery space;}
\]

\[
P = \text{the whole volume of the passenger spaces below the margin line, as defined in Regulation 2 of this Chapter;}
\]

\[
V = \text{the whole volume of the ship below the margin line;}
\]

\[
P_1 = KN \text{ where:}
\]

\[
N = \text{number of passengers for which the ship is to be certified, and}
\]

\[
K \text{ has the following values:}
\]

<table>
<thead>
<tr>
<th>Value of K</th>
<th>Length in feet and volumes in cubic feet</th>
<th>Length in metres and volumes in cubic metres</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.6L</td>
<td>. . . . . . . . . . . . . . . . . . . . . .</td>
<td>. . . . . . . . . . . . . . . . . . . . . . .</td>
</tr>
<tr>
<td>-0.056L</td>
<td>. . . . . . . . . . . . . . . . . . . . . .</td>
<td>. . . . . . . . . . . . . . . . . . . . . . .</td>
</tr>
</tbody>
</table>
Where the value of KN is greater than the sum of P and the whole volume of the actual passenger spaces above the margin line, the figure to be taken as \( P_1 \) is that sum or \( \frac{2}{3} \) KN, whichever is the greater.

When \( P_1 \) is greater than P—

\[
C_B = 72 \frac{M + 2P_1}{V + P_1 - P} \quad \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ (III)
\]

and in other cases—

\[
C_B = 72 \frac{M + 2P}{V} \quad \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ (IV)
\]

For ships not having a continuous bulkhead deck the volumes are to be taken up to the actual margin lines used in determining the floodable lengths.

(d) Rules for Subdivision of Ships other than those covered by paragraph (e) of this Regulation

(i) The subdivision abaft the forepeak of ships 430 feet (or 131 metres) in length and upwards having a criterion numeral of 23 or less shall be governed by the factor \( A \) given by formula (I); of those having a criterion numeral of 123 or more by the factor \( B \) given by formula (II); and of those having a criterion numeral between 23 and 123 by the factor \( F \) obtained by linear interpolation between the factors \( A \) and \( B \), using the formula:

\[
F = A - \frac{(A - B)(C - 23)}{100} \quad \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 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\ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \d
shall be governed by the factor unity; of those having a criterion numeral of 123 or more by the factor B given by the formula (II); of those having a criterion numeral between S and 123 by the factor F obtained by linear interpolation between unity and the factor B using the formula:

\[
F = 1 - \frac{(1-B)(C_S - S)}{123 - S}
\]  

(iii) The subdivision abaft the forepeak of ships less than 430 feet (or 131 metres) but not less than 260 feet (or 79 metres) in length and having a criterion numeral less than S, and of all ships less than 260 feet (or 79 metres) in length shall be governed by the factor unity, unless, in either case, it is shown to the satisfaction of the Administration to be impracticable to comply with this factor in any part of the ship, in which case the Administration may allow such relaxation as may appear to be justified, having regard to all the circumstances.

(iv) The provisions of sub-paragraph (iii) of this paragraph shall apply also to ships of whatever length, which are to be certified to carry a number of passengers exceeding 12 but not exceeding—

\[
\frac{L^2}{7,000} = \frac{L^2}{650} \text{ or 50, whichever is the less.}
\]

(e) Special Standards of Subdivision for Ships which are permitted under paragraph (c) of Regulation 27 of Chapter III to carry a number of persons on board in excess of the lifeboat capacity provided and are required under paragraph (d) of Regulation 1 of this Chapter to comply with special provisions.

(i) (1) In the case of ships primarily engaged in the carriage of passengers, the subdivision abaft the forepeak shall be governed by a factor of -50 or by the factor determined according to paragraphs (c) and (d) of this Regulation, if less than -50.

(2) In the case of such ships less than 300 feet (or 91-5 metres) in length, if the Administration is satisfied that compliance with such factor would be impracticable in a compartment, it may allow the length of that compartment to be governed by a higher factor provided the factor used is the lowest that is practicable and reasonable in the circumstances.

(ii) Where, in the case of any ship whether less than 300 feet (or 91-5 metres) or not, the necessity of carrying appreciable quantities of cargo makes it impracticable to require the subdivision abaft the forepeak to be governed by a factor not exceeding -50, the standard of subdivision to be applied shall be determined in accordance with the following sub-paragraphs (1) to (5), subject to the condition that where the Administration is satisfied that insistence on strict compliance in any respect would be unreasonable, it may allow such alternative arrangement of the watertight bulkheads as appears to be justified on merits and will not diminish the general effectiveness of the subdivision.
(1) The provisions of paragraph (c) of this Regulation relating to the criterion numeral shall apply with the exception that in calculating the value of \( P_1 \) for berthed passengers \( K \) is to have the value defined in paragraph (c) of this Regulation or 125 cubic feet (or 3.55 cubic metres), whichever is the greater, and for unberthed passengers \( K \) is to have the value 125 cubic feet (or 3.55 cubic metres).

(2) The factor \( B \) in paragraph (b) of this Regulation shall be replaced by the factor \( BB \) determined by the following formula:

\[
BB = \frac{57.6}{L - 108} + 0.20 \quad (L = 180 \text{ and upwards})
\]

\[
BB = \frac{17.6}{L - 33} + 0.20 \quad (L = 55 \text{ and upwards})
\]

(3) *The subdivision abaft the forepeak* of ships 430 feet (or 131 metres) in length and upwards having a criterion numeral of 23 or less shall be governed by the factor \( A \) given by formula (I) in paragraph (b) of this Regulation; of those having a criterion numeral of 123 or more by the factor \( BB \) given by the formula in sub-paragraph (ii) (2) of this paragraph; and of those having a criterion numeral between 23 and 123 by the factor \( F \) obtained by linear interpolation between the factors \( A \) and \( BB \), using the formula:

\[
F = A - \frac{(A - BB)(C_9 - 23)}{100}
\]

except that if the factor \( F \) so obtained is less than 0.50 the factor to be used shall be either 0.50 or the factor calculated according to the provisions of paragraph (d) (i) of this Regulation, whichever is the smaller.

(4) *The subdivision abaft the forepeak* of ships less than 430 feet (or 131 metres) but not less than 180 feet (or 55 metres) in length having a criterion numeral equal to \( S_1 \) where—

\[
S_1 = \frac{1,950 - 4L}{10} \quad (L \text{ in feet})
\]

\[
S_1 = \frac{3,712 - 25L}{19} \quad (L \text{ in metres})
\]

shall be governed by the factor unity; of those having a criterion numeral of 123 or more by the factor \( BB \) given by the formula in sub-paragraph (ii) (2) of this paragraph; of those having a criterion numeral between \( S_1 \) and 123 by the factor \( F \) obtained by linear interpolation between unity and the factor \( BB \) using the formula:
\[ F = 1 - \frac{(1 - BB) (C_b - S_1)}{123 - S_1} \]

except that in either of the two latter cases if the factor so obtained is less than 0.50 the subdivision may be governed by a factor not exceeding 0.50.

(5) The subdivision abaft the forepeak of ships less than 430 feet (or 131 metres) but not less than 180 feet (or 55 metres) in length and having a criterion numeral less than \( S_1 \) and of all ships less than 180 feet (or 55 metres) in length shall be governed by the factor unity, unless it is shown to the satisfaction of the Administration to be impracticable to comply with this factor in particular compartments, in which event the Administration may allow such relaxations in respect of those compartments as appear to be justified, having regard to all the circumstances, provided that the aftermost compartment and as many as possible of the forward compartments (between the forepeak and the after end of the machinery space) shall be kept within the floodable length.

Regulation 6

Special Rules concerning Subdivision

(a) Where in a portion or portions of a ship the watertight bulkheads are carried to a higher deck than in the remainder of the ship and it is desired to take advantage of this higher extension of the bulkheads in calculating the floodable length, separate margin lines may be used for each such portion of the ship provided that—

(i) the sides of the ship are extended throughout the ship’s length to the deck corresponding to the upper margin line and all openings in the shell plating below this deck throughout the length of the ship are treated as being below a margin line, for the purposes of Regulation 14 of this Chapter; and

(ii) the two compartments adjacent to the “step” in the bulkhead deck are each within the permissible length corresponding to their respective margin lines, and, in addition, their combined length does not exceed twice the permissible length based on the lower margin line.

(b) (i) A compartment may exceed the permissible length determined by the rules of Regulation 5 of this Chapter provided the combined length of each pair of adjacent compartments to which the compartment in question is common does not exceed either the floodable length or twice the permissible length, whichever is the less.

(ii) If one of the two adjacent compartments is situated inside the machinery space, and the second is situated outside the machinery space, and the average permeability of the portion of the ship in which the second is situated differs from that of the machinery space, the combined length of the two compartments shall be adjusted to the mean average permeability of the two portions of the ship in which the compartments are situated.

No. 7794
(iii) Where the two adjacent compartments have different factors of subdivision, the combined length of the two compartments shall be determined proportionately.

(c) In ships 330 feet (or 100 metres) in length and upwards, one of the main transverse bulkheads abaft the forepeak shall be fitted at a distance from forward perpendicular which is not greater than the permissible length.

(d) A main transverse bulkhead may be recessed provided that all parts of the recess lie inboard of vertical surfaces on both sides of the ship, situated at a distance from the shell plating equal to one-fifth the breadth of the ship, as defined in Regulation 2 of this Chapter, and measured at right angles to the centre line at the level of the deepest subdivision loadline.

Any part of a recess which lies outside these limits shall be dealt with as a step in accordance with paragraph (e) of this Regulation.

(e) A main transverse bulkhead may be stepped provided that it meets one of the following conditions:

(i) the combined length of the two compartments, separated by the bulkhead in question, does not exceed either 90 per cent. of the floodable length or twice the permissible length, except that in ships having a factor of subdivision greater than -9, the combined length of the two compartments in question shall not exceed the permissible length;

(ii) additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead;

(iii) the compartment over which the step extends does not exceed the permissible length corresponding to a margin line taken 3 inches (or 76 millimetres) below the step.

(f) Where a main transverse bulkhead is recessed or stepped, an equivalent plane bulkhead shall be used in determining the subdivision.

(g) If the distance between two adjacent main transverse bulkheads, or their equivalent plane bulkheads, or the distance between the transverse planes passing through the nearest stepped portions of the bulkheads, is less than 10 feet (or 3.05 metres) plus 3 per cent. of the length of the ship, or 35 feet (or 10.67 metres) whichever is the less, only one of these bulkheads shall be regarded as forming part of the subdivision of the ship in accordance with the provisions of Regulation 5 of this Chapter.

(h) Where a main transverse watertight compartment contains local subdivision and it can be shown to the satisfaction of the Administration that, after any assumed side damage extending over a length of 10 feet (or 3.05 metres) plus 3 per cent. of the length of the ship, or 35 feet (or 10.67 metres) whichever is the less, the whole volume of the main compartment will not be flooded, a proportionate allowance may be made in the permissible length otherwise required for such compartment. In such a case the volume of effective buoyancy assumed on the undamaged side shall not be greater than that assumed on the damaged side.
(i) Where the required factor of subdivision is \( -50 \) or less, the combined length of any two adjacent compartments shall not exceed the floodable length.

Regulation 7
STABILITY OF SHIPS IN DAMAGED CONDITION

(a) Sufficient intact stability shall be provided in all service conditions so as to enable the ship to withstand the final stage of flooding of any one main compartment which is required to be within the floodable length.

Where two adjacent main compartments are separated by a bulkhead which is stepped under the conditions of sub-paragraph (e) (i) of Regulation 6 of this Chapter the intact stability shall be adequate to withstand the flooding of those two adjacent main compartments.

Where the required factor of subdivision is \( -50 \) or less but more than \( -33 \) intact stability shall be adequate to withstand the flooding of any two adjacent main compartments.

Where the required factor of subdivision is \( -33 \) or less the intact stability shall be adequate to withstand the flooding of any three adjacent main compartments.

(b) (i) The requirements of paragraph (a) of this Regulation shall be determined by calculations which are in accordance with paragraphs (c), (d) and (f) of this Regulation and which take into consideration the proportions and design characteristics of the ship and the arrangement and configuration of the damaged compartments. In making these calculations the ship is to be assumed in the worst anticipated service condition as regards stability.

(ii) Where it is proposed to fit decks, inner skins or longitudinal bulkheads of sufficient tightness to seriously restrict the flow of water, the Administration shall be satisfied that proper consideration is given to such restrictions in the calculations.

(iii) In cases where the Administration considers the range of stability in the damaged condition to be doubtful, it may require investigation thereof.

(c) For the purpose of making damage stability calculations the volume and surface permeabilities shall be in general as follows:

<table>
<thead>
<tr>
<th>Spaces</th>
<th>Permeability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriated to Cargo, Coal or Stores</td>
<td>60</td>
</tr>
<tr>
<td>Occupied by Accommodation</td>
<td>95</td>
</tr>
<tr>
<td>Occupied by Machinery</td>
<td>85</td>
</tr>
<tr>
<td>Intended for Liquids</td>
<td>0 or 95*</td>
</tr>
</tbody>
</table>

*Whichever results in the more severe requirements.
Higher surface permeabilities are to be assumed in respect of spaces which, in the vicinity of the damage waterplane, contain no substantial quantity of accommodation or machinery and spaces which are not generally occupied by any substantial quantity of cargo or stores.

(d) Assumed extent of damage shall be as follows:

(i) **longitudinal extent**: 10 feet (or 3.05 metres) plus 3 per cent. of the length of the ship, or 35 feet (or 10.67 metres) whichever is the less. Where the required factor of subdivision is \(0.33\) or less the assumed longitudinal extent of damage shall be increased as necessary so as to include any two consecutive main transverse watertight bulkheads;

(ii) **transverse extent** (measured inboard from the ship's side, at right angles to the centre line at the level of the deepest subdivision loadline): a distance of one-fifth of the breadth of the ship, as defined in Regulation 2 of this Chapter;

(iii) **vertical extent**: from the base line upwards without limit.

(iv) If any damage of lesser extent than that indicated in sub-paragraphs (i), (ii) and (iii) of this paragraph would result in a more severe condition regarding heel or loss of metacentric height, such damage shall be assumed in the calculations.

(e) Unsymmetrical flooding is to be kept to a minimum consistent with efficient arrangements. Where it is necessary to correct large angles of heel, the means adopted shall, where practicable, be self-acting, but in any case where controls to cross-flooding fittings are provided they shall be operable from above the bulkhead deck. These fittings together with their controls as well as the maximum heel before equalisation shall be acceptable to the Administration. Where cross-flooding fittings are required the time for equalisation shall not exceed 15 minutes. Suitable information concerning the use of cross-flooding fittings shall be supplied to the master of the ship.

(f) The final conditions of the ship after damage and, in the case of unsymmetrical flooding, after equalisation measures have been taken shall be as follows:

(i) in the case of symmetrical flooding there shall be a positive residual metacentric height of at least 2 inches (or 0.05 metres) as calculated by the constant displacement method;

(ii) in the case of unsymmetrical flooding the total heel shall not exceed seven degrees, except that, in special cases, the Administration may allow additional heel due to the unsymmetrical moment, but in no case shall the final heel exceed fifteen degrees;

(iii) in no case shall the margin line be submerged in the final stage of flooding. If it is considered that the margin line may become submerged during an intermediate
stage of flooding, the Administration may require such investigations and arrangements as it considers necessary for the safety of the ship.

(g) The master of the ship shall be supplied with the data necessary to maintain sufficient intact stability under service conditions to enable the ship to withstand the critical damage. In the case of ships requiring cross-flooding the master of the ship shall be informed of the conditions of stability on which the calculations of heel are based and be warned that excessive heeling might result should the ship sustain damage when in a less favourable condition.

(h) (i) No relaxation from the requirements for damage stability may be considered by the Administration unless it is shown that the intact metacentric height in any service condition necessary to meet these requirements is excessive for the service intended.

(ii) Relaxations from the requirements for damage stability shall be permitted only in exceptional cases and subject to the condition that the Administration is to be satisfied that the proportions, arrangements and other characteristics of the ship are the most favourable to stability after damage which can practically and reasonably be adopted in the particular circumstances.

Regulation 8
Ballasting

When ballasting with water is necessary, the water ballast should not in general be carried in tanks intended for oil fuel. In ships in which it is not practicable to avoid putting water in oil fuel tanks, oily-water separator equipment to the satisfaction of the Administration shall be fitted, or other alternative means acceptable to the Administration shall be provided for disposing of the oily-water ballast.

Regulation 9
Peek and Machinery Space Bulkheads, Shaft Tunnels, &c.

(a) (i) A ship shall have a forepeak or collision bulkhead, which shall be watertight up to the bulkhead deck. This bulkhead shall be fitted not less than 5 per cent. of the length of the ship, and not more than 10 feet (or 3.05 metres) plus 5 per cent. of the length of the ship from the forward perpendicular.

(ii) If the ship has a long forward superstructure, the forepeak bulkhead shall be extended weathertight to the deck next above the bulkhead deck. The extension need not be fitted directly over the bulkhead below, provided it is at least 5 per cent. of the length of the ship from the forward perpendicular, and the part of the bulkhead deck which forms the step is made effectively weathertight.
An afterpeak bulkhead, and bulkheads dividing the machinery space, as defined in Regulation 2 of this Chapter, from the cargo and passenger spaces forward and aft, shall also be fitted and made watertight up to the bulkhead deck. The afterpeak bulkhead may, however, be stopped below the bulkhead deck, provided the degree of safety of the ship as regards subdivision is not thereby diminished.

In all cases stern tubes shall be enclosed in watertight spaces of moderate volume. The stern gland shall be situated in a watertight shaft tunnel or other watertight space separate from the stern tube compartment and of such volume that, if flooded by leakage through the stern gland, the margin line will not be submerged.

**Regulation 10**

**DOUBLE BOTTOMS**

(a) A double bottom shall be fitted extending from the forepeak bulkhead to the afterpeak bulkhead as far as this is practicable and compatible with the design and proper working of the ship.

(i) In ships 165 feet (or 50 metres) and under 200 feet (or 61 metres) in length a double bottom shall be fitted at least from the machinery space to the forepeak bulkhead, or as near thereto as practicable.

(ii) In ships 200 feet (or 61 metres) and under 249 feet (or 76 metres) in length a double bottom shall be fitted at least outside the machinery space, and shall extend to the fore and after peak bulkheads, or as near thereto as practicable.

(iii) In ships 249 feet (or 76 metres) in length and upwards a double bottom shall be fitted amidships, and shall extend to the fore and after peak bulkheads, or as near thereto as practicable.

(b) Where a double bottom is required to be fitted its depth shall be to the satisfaction of the Administration and the inner bottom shall be continued out to the ship's sides in such a manner as to protect the bottom to the turn of the bilge. Such protection will be deemed satisfactory if the line of intersection of the outer edge of the margin plate with the bilge plating is not lower at any part than a horizontal plane passing through the point of intersection with the frame line amidships of a transverse diagonal line inclined at 25 degrees to the base line and cutting it at a point one-half the ship's moulded breadth from the middle line.

(c) Small wells constructed in the double bottom in connection with drainage arrangements of holds, &c., shall not extend downwards more than necessary. The depth of the well shall in no case be more than the depth less 18 inches (or 457 millimetres) of the double bottom at the centreline, nor shall the well extend below the horizontal plane referred to in paragraph (b) of this Regulation. A well extending to the outer bottom is, however, permitted at the after end of the shaft tunnel of screw ships. Other wells (e.g., for lubri-
cating oil under main engines) may be permitted by the Administration if satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this Regulation.

(d) A double bottom need not be fitted in way of watertight compartments of moderate size used exclusively for the carriage of liquids, provided the safety of the ship, in the event of bottom or side damage, is not, in the opinion of the Administration, thereby impaired.

(e) In the case of ships to which the provisions of paragraph (d) of Regulation 1 of this Chapter apply and which are engaged on regular service within the limits of a short international voyage as defined in Regulation 2 of Chapter III, the Administration may permit a double bottom to be dispensed with in any part of the ship which is subdivided by a factor not exceeding .50, if satisfied that the fitting of a double bottom in that part would not be compatible with the design and proper working of the ship.

Regulation 11
ASSIGNING, MARKING AND RECORDING OF SUBDIVISION LOADLINES

(a) In order that the required degree of subdivision shall be maintained, a loadline corresponding to the approved subdivision draught shall be assigned and marked on the ship's sides. A ship having spaces which are specially adapted for the accommodation of passengers and the carriage of cargo alternatively may, if the owners desire, have one or more additional loadlines assigned and marked to correspond with the subdivision draughts which the Administration may approve for the alternative service conditions.

(b) The subdivision loadlines assigned and marked shall be recorded in the Passenger Ship Safety Certificate, and shall be distinguished by the notation C.1 for the principal passenger condition, and C.2, C.3, &c., for the alternative conditions.

(c) The freeboard corresponding to each of these loadlines shall be measured at the same position and from the same deck line as the freeboards determined in accordance with the International Convention respecting Load Lines in force.¹

(d) The freeboard corresponding to each approved subdivision loadline and the conditions of service for which it is approved, shall be clearly indicated on the Passenger Ship Safety Certificate.

(e) In no case shall any subdivision loadline mark be placed above the deepest loadline in salt water as determined by the strength of the ship and/or the International Convention respecting Load Lines in force.

(f) Whatever may be the position of the subdivision loadline marks, a ship shall in no case be loaded so as to submerge the loadline mark appropriate to the season and locality as determined in accordance with the International Convention respecting Load Lines in force.

(g) A ship shall in no case be so loaded that when she is in salt water the subdivision loadline mark appropriate to the particular voyage and condition of service is submerged.

**Regulation 12**

**Construction and Initial Testing of Watertight Bulkheads, &c.**

(a) Each watertight subdivision bulkhead, whether transverse or longitudinal, shall be constructed in such a manner that it shall be capable of supporting, with a proper margin of resistance, the pressure due to the maximum head of water which it might have to sustain in the event of damage to the ship but at least the pressure due to a head of water up to the margin line. The construction of these bulkheads shall be to the satisfaction of the Administration.

(b) (i) Steps and recesses in bulkheads shall be watertight and as strong as the bulkhead at the place where each occurs.

(ii) Where frames or beams pass through a watertight deck or bulkhead, such deck or bulkhead shall be made structurally watertight without the use of wood or cement.

(c) Testing main compartments by filling them with water is not compulsory. When testing by filling with water is not carried out, a hose test is compulsory; this test shall be carried out in the most advanced stage of the fitting out of the ship. In any case, a thorough inspection of the watertight bulkheads shall be carried out.

(d) The forepeak, double bottoms (including duct keels) and inner skins shall be tested with water to a head corresponding to the requirements of paragraph (a) of this Regulation.

(e) Tanks which are intended to hold liquids, and which form part of the subdivision of the ship, shall be tested for tightness with water to a head up to the deepest subdivision loadline or to a head corresponding to two-thirds of the depth from the top of keel to the margin line in way of the tanks, whichever is the greater; provided that in no case shall the test head be less than 3 feet (or 0.92 metres) above the top of the tank.

(f) The tests referred to in paragraphs (d) and (e) of this Regulation are for the purpose of ensuring that the subdivision structural arrangements are watertight and are not to be regarded as a test of the fitness of any compartment for the storage of oil fuel.
or for other special purposes for which a test of a superior character may be required depending on the height to which the liquid has access in the tank or its connections.

**Regulation 13**

**Openings in Watertight Bulkheads**

(a) The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the ship; satisfactory means shall be provided for closing these openings.

(b) (i) Where pipes, scuppers, electric cables, &c., are carried through watertight subdivision bulkheads, arrangements shall be made to ensure the integrity of the watertightness of the bulkheads.

(ii) Valves and cocks not forming part of a piping system shall not be permitted in watertight subdivision bulkheads.

(iii) Lead or other heat sensitive materials shall not be used in systems which penetrate watertight subdivision bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads.

(c) (i) No doors, manholes, or access openings are permitted:

1. in the collision bulkhead below the margin line;
2. in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space or from a permanent or reserve bunker, except as provided in paragraph (l) of this Regulation.

(ii) Except as provided in sub-paragraph (iii) of this paragraph, the collision bulkhead may be pierced below the margin line by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a screwdown valve capable of being operated from above the bulkhead deck, the valve chest being secured inside the forepeak to the collision bulkhead.

(iii) If the forepeak is divided to hold two different kinds of liquids the Administration may allow the collision bulkhead to be pierced below the margin line by two pipes, each of which is fitted as required by subparagraph (ii) of this paragraph, provided the Administration is satisfied that there is no practical alternative to the fitting of such a second pipe and that, having regard to the additional subdivision provided in the forepeak, the safety of the ship is maintained.

(d) (i) Watertight doors fitted in bulkheads between permanent and reserve bunkers shall be always accessible, except as provided in subparagraph (ii) of paragraph (k) of this Regulation for between deck bunker doors.

(ii) Satisfactory arrangements shall be made by means of screens or otherwise to prevent the coal from interfering with the closing of watertight bunker doors.
(e) Within spaces containing the main and auxiliary propelling machinery including boilers serving the needs of propulsion and all permanent bunkers, not more than one door apart from the doors to bunkers and shaft tunnels may be fitted in each main transverse bulkhead. Where two or more shafts are fitted the tunnels shall be connected by an inter-communicating passage. There shall be only one door between the machinery space and the tunnel spaces where two shafts are fitted and only two doors where there are more than two shafts. All these doors shall be of the sliding type and shall be located so as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery if this is consistent with a satisfactory arrangement of the necessary gearing.

(f) (i) Watertight doors shall be sliding doors or hinged doors or doors of an equivalent type. Plate doors secured only by bolts and doors required to be closed by dropping or by the action of a dropping weight are not permitted.

(ii) Sliding doors may be either:
   - hand operated only, or
   - power operated as well as hand operated.

(iii) Authorized watertight doors may therefore be divided into three Classes:
   - Class 1—hinged doors;
   - Class 2—hand operated sliding doors;
   - Class 3—sliding doors which are power operated as well as hand operated.

(iv) The means of operation of any watertight door whether power operated or not shall be capable of closing the door with the ship listed to 15 degrees either way.

(v) In all classes of watertight doors indicators shall be fitted which show, at all operating stations from which the doors are not visible, whether the doors are open or closed. If any of the watertight doors, of whatever Class, is not fitted so as to enable it to be closed from a central control station, it shall be provided with a mechanical, electrical, telephonic, or any other suitable direct means of communication, enabling the officer of the watch promptly to contact the person who is responsible for closing the door in question, under previous orders.

(g) Hinged doors (Class 1) shall be fitted with quick action closing devices, such as catches, workable from each side of the bulkhead.

(h) Hand operated sliding doors (Class 2) may have a horizontal or vertical motion. It shall be possible to operate the mechanism at the door itself from either side, and in addition, from an accessible position above the bulkhead deck, with an all round crank motion, or some other movement providing the same guarantee of safety and of an approved type. Departures from the requirement of operation on both sides may be al-
lowed, if this requirement is impossible owing to the layout of the spaces. When operating a hand gear the time necessary for the complete closure of the door with the vessel upright, shall not exceed 90 seconds.

(i) Power operated sliding doors (Class 3) may have a vertical or horizontal motion. If a door is required to be power operated from a central control, the gearing shall be so arranged that the door can be operated by power also at the door itself from both sides. The arrangement shall be such that the door will close automatically if opened by local control after being closed from the central control, and also such that any door can be kept closed by local systems which will prevent the door from being opened from the upper control. Local control handles in connection with the power gear shall be provided each side of the bulkhead and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the closing mechanism in operation accidentally. Power operated sliding doors shall be provided with hand gear workable at the door itself on either side and from an accessible position above the bulkhead deck, with an all-round crank motion or some other movement proving the same guarantee of safety and of an approved type. Provision shall be made to give warnings by sound signal that the door has begun to close and will continue to move until it is completely closed. The door shall take a sufficient time to close to ensure safety.

(ii) There shall be at least two independent power sources capable of opening and closing all the doors under control, each of them capable of operating all the doors simultaneously. The two power sources shall be controlled from the central station on the bridge provided with all the necessary indicators for checking that each of the two power sources is capable of giving the required service satisfactorily.

(iii) In the case of hydraulic operation, each power source shall consist of a pump capable of closing all doors in not more than 60 seconds. In addition, there shall be for the whole installation hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e., closed—open—closed. The fluid used shall be one which does not freeze at any of the temperatures liable to be encountered by the ship during its service.

(j) Hinged watertight doors (Class 1) in passenger, crew and working spaces are only permitted above a deck the underside of which, at its lowest point at side, is at least 7 feet (or 2.13 metres) above the deepest subdivision loadline.

(ii) Watertight doors, the sills of which are above the deepest loadline and below the line specified in the preceding sub-paragraph shall be sliding doors and may be hand operated (Class 2), except in vessels engaged on short international voyages and required to have a factor of subdivision of ·50 or less in which all such doors shall be power
operated. When trunkways in connection with refrigerated cargo and ventilation or forced draught ducts are carried through more than one main watertight subdivision bulkhead, the doors at such openings shall be operated by power.

(k) (i) Watertight doors which may sometimes be opened at sea, and the sills of which are below the deepest subdivision loadline shall be sliding doors. The following rules shall apply:

(1) when the number of such doors (excluding doors at entrances to shaft tunnels) exceeds five, all of these doors and those at the entrance to shaft tunnels or ventilation or forced draught ducts, shall be power operated (Class 3) and shall be capable of being simultaneously closed from a central station situated on the bridge;

(2) when the number of such doors (excluding doors at entrances to shaft tunnels) is greater than one, but does not exceed five,
   (a) where the ship has no passenger spaces below the bulkhead deck, all the above mentioned doors may be hand operated (Class 2);
   (b) where the ship has passenger spaces below the bulkhead deck all the above mentioned doors shall be power operated (Class 3) and shall be capable of being simultaneously closed from a central station situated on the bridge;

(3) in any ship where there are only two such watertight doors and they are into or within the space containing machinery, the Administration may allow these two doors to be hand operated only (Class 2).

(ii) If sliding watertight doors which have sometimes to be open at sea for the purpose of trimming coal are fitted between bunkers in the between decks below the bulkhead deck, these doors shall be operated by power. The opening and closing of these doors shall be recorded in such log book as may be prescribed by the Administration.

(l) (i) If the Administration is satisfied that such doors are essential, watertight doors of satisfactory construction may be fitted in watertight bulkheads dividing cargo between deck spaces. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable, but in no case shall the outboard vertical edges be situated at a distance from the shell plating which is less than one-fifth of the breadth of the ship, as defined in Regulation 2 of this Chapter, such distance being measured at right angles to the centre line of the ship at the level of the deepest subdivision loadline.

(ii) Such doors shall be closed before the voyage commences and shall be kept closed during navigation; and the time of opening such doors in port and of closing them before the ship leaves port shall be entered in the log book. Should any of the doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening.
When it is proposed to fit such doors, the number and arrangements shall receive the special consideration of the Administration.

\( \text{(m)} \) Portable plates on bulkheads shall not be permitted except in machinery spaces. Such plates shall always be in place before the ship leaves port, and shall not be removed during navigation except in case of urgent necessity. The necessary precautions shall be taken in replacing them to ensure that the joints shall be watertight.

\( \text{(n)} \) All watertight doors shall be kept closed during navigation except when necessarily opened for the working of the ship, and shall always be ready to be immediately closed.

\( \text{(o)} \) (i) Where trunkways or tunnels for access from crew accommodation to the stokehold, for piping, or for any other purpose are carried through main transverse watertight bulkheads, they shall be watertight and in accordance with the requirements of Regulation 16 of this Chapter. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the margin line. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

(ii) Where it is proposed to fit tunnels or trunkways for forced draught, piercing main transverse watertight bulkheads, these shall receive the special consideration of the Administration.

\textit{Regulation 14}

\textbf{Openings in the Shell Plating below the Margin Line}

\( \text{(a)} \) The number of openings in the shell plating shall be reduced to the minimum compatible with the design and proper working of the ship.

\( \text{(b)} \) The arrangement and efficiency of the means for closing any opening in the shell plating shall be consistent with its intended purpose and the position in which it is fitted and generally to the satisfaction of the Administration.

\( \text{(c)} \) (i) If in a between decks, the sills of any sidescuttles are below a line drawn parallel to the bulkhead deck at side and having its lowest point 2.5 per cent. of the breadth of the ship above the deepest subdivision loadline, all sidescuttles in that between deck shall be of the non-opening type.

(ii) All sidescuttles the sills of which are below the margin line, other than those required to be of a non-opening type by sub-paragraph (i) of this paragraph, shall be of such construction as will effectively prevent any person opening them without the consent of the master of the ship.
(iii) (1) Where in a between decks, the sills of any of the sidescuttles referred to in sub-paragraph (ii) of this paragraph are below a line drawn parallel to the bulkhead deck at side and having its lowest point 4½ feet (or 1·37 metres) plus 2½ per cent. of the breadth of the ship above the water when the ship departs from any port, all the sidescuttles in that between decks shall be closed watertight and locked before the ship leaves port, and they shall not be opened before the ship arrives at the next port. In the application of this sub-paragraph the appropriate allowance for fresh water may be made when applicable.

(2) The time of opening such sidescuttles in port and of closing and locking them before the ship leaves port shall be entered in such log book as may be prescribed by the Administration.

(3) For any ship that has one or more sidescuttles so placed that the requirements of clause (1) of this sub-paragraph would apply when she was floating at her deepest subdivision loadline, the Administration may indicate the limiting mean draught at which these sidescuttles will have their sills above the line drawn parallel to the bulkhead deck at side, and having its lowest point 4½ feet (or 1·37 metres) plus 2½ per cent. of the breadth of the ship above the waterline corresponding to the limiting mean draught, and at which it will therefore be permissible to depart from port without previously closing and locking them and to open them at sea on the responsibility of the master during the voyage to the next port. In tropical zones as defined in the International Convention respecting Load Lines in force, this limiting draught may be increased by 1 foot (or 0·305 metres).

(d) Efficient hinged inside deadlights arranged so that they can be easily and effectively closed and secured watertight shall be fitted to all sidescuttles except that abaft one-eighth of the ship's length from the forward perpendicular and above a line drawn parallel to the bulkhead deck at side and having its lowest point at a height of 12 feet (or 3·66 metres) plus 2½ per cent. of the breadth of the ship above the deepest subdivision loadline, the deadlights may be portable in passenger accommodation other than that for steerage passengers, unless the deadlights are required by the International Convention respecting Load Lines in force to be permanently attached in their proper positions. Such portable deadlights shall be stowed adjacent to the sidescuttles they serve.

(e) Sidescuttles and their deadlights, which will not be accessible during navigation, shall be closed and secured before the ship leaves port.

(f) (i) No sidescuttles shall be fitted in any spaces which are appropriated exclusively to the carriage of cargo or coal.

(ii) Sidescuttles may, however, be fitted in spaces appropriated alternatively to the carriage of cargo or passengers, but they shall be of such construction as will effectively prevent any person opening them or their deadlights without the consent of the master of the ship.
(iii) If cargo is carried in such spaces, the sidescuttles and their deadlights shall be closed watertight and locked before the cargo is shipped and such closing and locking shall be recorded in such log book as may be prescribed by the Administration.

(g) Automatic ventilating sidescuttles shall not be fitted in the shell plating below the margin line without the special sanction of the Administration.

(h) The number of scuppers, sanitary discharges and other similar openings in the shell plating shall be reduced to the minimum either by making each discharge serve for as many as possible of the sanitary and other pipes, or in any other satisfactory manner.

(i) All inlets and discharges in the shell plating shall be fitted with efficient and accessible arrangements for preventing the accidental admission of water into the ship. Lead or other heat sensitive materials shall not be used for pipes fitted outboard of shell valves in inlets or discharges, or any other application where the deterioration of such pipes in the event of fire would give rise to danger of flooding.

(ii) (1) Except as provided in sub-paragraph (iii) of this paragraph, each separate discharge led through the shell plating from spaces below the margin line shall be provided either with one automatic non-return valve fitted with a positive means of closing it from above the bulkhead deck, or, alternatively, with two automatic non-return valves without such means, the upper of which is so situated above the deepest subdivision loadline as to be always accessible for examination under service conditions, and is of a type which is normally closed.

(2) Where a valve with positive means of closing is fitted, the operating position above the bulkhead deck shall always be readily accessible, and means shall be provided for indicating whether the valve is open or closed.

(iii) Main and auxiliary sea inlets and discharges in connection with machinery shall be fitted with readily accessible cocks or valves between the pipes and shell plating or between the pipes and fabricated boxes attached to the shell plating.

(j) (i) Gangway, cargo and coaling ports fitted below the margin line shall be of sufficient strength. They shall be effectively closed and secured watertight before the ship leaves port, and shall be kept closed during navigation.

(ii) Such ports shall be in no case fitted so as to have their lowest point below the deepest subdivision loadline.

(k) (i) The inboard opening of each ash-shoot, rubbish-shoot, &c. shall be fitted with an efficient cover.

(ii) If the inboard opening is situated below the margin line, the cover shall be watertight, and in addition an automatic non-return valve shall be fitted in the shoot in an easily accessible position above the deepest subdivision loadline. When the shoot is not in use both the cover and the valve shall be kept closed and secured.
Regulation 15

Construction and Initial Tests of Watertight Doors, Sidescuttles, &c.

(a) (i) The design, materials and construction of all watertight doors, sidescuttles, gangway, cargo and coaling ports, valves, pipes, ash-shoots and rubbish-shoots referred to in these Regulations shall be to the satisfaction of the Administration.

(ii) The frames of vertical watertight doors shall have no groove at the bottom in which dirt might lodge and prevent the door closing properly.

(iii) All cocks and valves for sea inlets and discharges below the bulkhead deck and all fittings outboard of such cocks and valves shall be made of steel, bronze or other approved ductile material. Ordinary cast iron or similar materials shall not be used.

(b) Each watertight door shall be tested by water pressure to a head up to the bulkhead deck. The test shall be made before the ship is put in service, either before or after the door is fitted.

Regulation 16

Construction and Initial Tests of Watertight Decks, Trunks, &c.

(a) Watertight decks, trunks, tunnels, duct keels and ventilators shall be of the same strength as watertight bulkheads at corresponding levels. The means used for making them watertight, and the arrangements adopted for closing openings in them, shall be to the satisfaction of the Administration. Watertight ventilators and trunks shall be carried at least up to the bulkhead deck.

(b) After completion, a hose or flooding test shall be applied to watertight decks and a hose test to watertight trunks, tunnels and ventilators.

Regulation 17

Watertight Integrity above the Margin Line

(a) The Administration may require that all reasonable and practicable measures shall be taken to limit the entry and spread of water above the bulkhead deck. Such measures may include partial bulkheads or webs. When partial watertight bulkheads and webs are fitted on the bulkhead deck, above or in the immediate vicinity of main subdivision bulkheads, they shall have watertight shell and bulkhead deck connections so as to restrict the flow of water along the deck when the ship is in a heeled damaged condition. Where the partial watertight bulkhead does not line up with the bulkhead below, the bulkhead deck between shall be made effectively watertight.
(b) The bulkhead deck or a deck above it shall be weathertight in the sense that in ordinary sea conditions water will not penetrate in a downward direction. All openings in the exposed weather deck shall have coamings of ample height and strength and shall be provided with efficient means for expeditiously closing them weathertight. Freeing ports, open rails and/or scuppers shall be fitted as necessary for rapidly clearing the weather deck of water under all weather conditions.

(c) Sidescuttles, gangway, cargo and coaling ports and other means for closing openings in the shell plating above the margin line shall be of efficient design and construction and of sufficient strength having regard to the spaces in which they are fitted and their positions relative to the deepest subdivision loadline.

(d) Efficient inside deadlights, arranged so that they can be easily and effectively closed and secured watertight, shall be provided for all sidescuttles to spaces below the first deck above the bulkhead deck.

Regulation 18
Bilge Pumping Arrangements in Passenger Ships

(a) Ships shall be provided with an efficient bilge pumping plant capable of pumping from and draining any watertight compartment which is neither a permanent oil compartment nor a permanent water compartment under all practicable conditions after a casualty whether the ship is upright or listed. For this purpose wing suctions will generally be necessary except in narrow compartments at the ends of the ship, where one suction may be sufficient. In compartments of unusual form, additional suctions may be required. Arrangements shall be made whereby water in the compartment may find its way to the suction pipes. Where in relation to particular compartments the Administration is satisfied that the provision of drainage may be undesirable, it may allow such provision to be dispensed with if calculations made in accordance with the conditions laid down in paragraph (b) of Regulation 7 of this Chapter show that the safety of the ship will not be impaired. Efficient means shall be provided for draining water from insulated holds.

(b) (i) Ships shall have at least three power pumps connected to the bilge main, one of which may be attached to the propelling unit. Where the criterion numeral is 30 or more, one additional independent power pump shall be provided.

(ii) The requirements are summarised in the following table:
(iii) Sanitary, ballast and general service pumps may be accepted as independent power bilge pumps if fitted with the necessary connections to the bilge pumping system.

(c) Where practicable, the power bilge pumps shall be placed in separate watertight compartments so arranged or situated that these compartments will not readily be flooded by the same damage. If the engines and boilers are in two or more watertight compartments, the pump available for bilge service shall be distributed throughout these compartments as far as is possible.

(d) On ships 300 feet (or 91-5 metres) or more in length or having a criterion numeral of 30 or more, the arrangements shall be such that at least one power pump shall be available for use in all ordinary circumstances in which a ship may be flooded at sea. This requirement will be satisfied if:

(i) one of the required pumps is an emergency pump of a reliable submersible type having a source of power situated above the bulkhead deck; or

(ii) the pumps and their sources of power are so disposed throughout the length of the ship that under any condition of flooding which the ship is required to withstand, at least one pump in an undamaged compartment will be available.

(e) With the exception of additional pumps which may be provided for peak compartments only, each required bilge pump shall be arranged to draw water from any space required to be drained by paragraph (a) of this Regulation.

(f) (i) Each power bilge pump shall be capable of giving a speed of water through the required main bilge pipe of not less than 400 feet (or 122 metres) per minute. Independent power bilge pumps situated in machinery spaces shall have direct suctions from these spaces, except that not more than two such suctions shall be required in any one space. Where two or more such suctions are provided there shall be at least one on the port side and one on the starboard side. The Administration may require independent power bilge pumps situated in other spaces to have separate direct suctions. Direct suctions shall be suitably arranged and those in a machinery space shall be of a diameter not less than that required for the bilge main.
(ii) In coal-burning ships there shall be provided in the stokehold, in addition to the other suctions required by this Regulation, a flexible suction hose of suitable diameter and sufficient length, capable of being connected to the suction side of an independent power pump.

(g) (i) In addition to the direct bilge suction or suctions required by paragraph (f) of this Regulation there shall be in the machinery space a direct suction from the main circulating pump leading to the drainage level of the machinery space and fitted with a non-return valve. The diameter of this direct suction pipe shall be at least two-thirds of the diameter of the pump inlet in the case of steamships, and of the same diameter as the pump inlet in the case of motorships.

(ii) Where in the opinion of the Administration the main circulating pump is not suitable for this purpose, a direct emergency bilge suction shall be led from the largest available independent power driven pump to the drainage level of the machinery space; the suction shall be of the same diameter as the main inlet of the pump used. The capacity of the pump so connected shall exceed that of a required bilge pump by an amount satisfactory to the Administration.

(iii) The spindles of the sea inlet and direct suction valves shall extend well above the engine room platform.

(iv) Where the fuel is, or may be, coal and there is no watertight bulkhead between the engines and the boilers, a direct discharge overboard or alternatively a by-pass to the circulating pump discharge, shall be fitted from any circulating pump used in compliance with sub-paragraph (i) of this paragraph.

(h) (i) All pipes from the pumps which are required for draining cargo or machinery spaces shall be entirely distinct from pipes which may be used for filling or emptying spaces where water or oil is carried.

(ii) All bilge pipes used in or under coal bunkers or fuel storage tanks or in boiler or machinery spaces, including spaces in which oil-settling tanks or oil fuel pumping units are situated, shall be of steel or other approved material.

(i) The diameter of the bilge main shall be calculated according to the following formulae provided that the actual internal diameter of the bilge main may be of the nearest standard size acceptable to the Administration:

\[ d = \sqrt{\frac{L(B + D)}{2,500}} + 1 \]

where \( d \) = internal diameter of the bilge main in inches
\( L \) = length of ship in feet
B = breadth of ship in feet  
D = moulded depth of ship to bulkhead deck in feet;

or

\[
d = 1.68 \sqrt{L (B + D) + 25}
\]

where 
\(d\) = internal diameter of the bilge main in millimetres  
\(L\) = length of ship in metres  
\(B\) = breadth of ship in metres  
\(D\) = moulded depth of ship to bulkhead deck in metres.

The diameter of the bilge branch pipes shall be determined by rules to be made by the Administration.

\((j)\) The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from the sea and from water ballast spaces into the cargo and machinery spaces, or from one compartment to another. Special provision shall be made to prevent any deep tank having bilge and ballast connections being inadvertently run up from the sea when containing cargo, or pumped out through a bilge pipe when containing water ballast.

\((k)\) Provision shall be made to prevent the compartment served by any bilge suction pipe being flooded in the event of the pipe being severed, or otherwise damaged by collision or grounding in any other compartment. For this purpose, where the pipe is at any part situated nearer the side of the ship than one-fifth the breadth of the ship (measured at right angles to the centre line at the level of the deepest subdivision loadline), or in a duct keel, a non-return valve shall be fitted to the pipe in the compartment containing the open end.

\((l)\) All the distribution boxes, cocks and valves in connection with the bilge pumping arrangements shall be in positions which are accessible at all times under ordinary circumstances. They shall be so arranged that, in the event of flooding, one of the bilge pumps may be operative on any compartment; in addition, damage to a pump or its pipe connecting to the bilge main outboard of a line drawn at one-fifth of the breadth of the ship shall not put the bilge system out of action. If there is only one system of pipes common to all the pumps, the necessary cocks or valves for controlling the bilge suctions must be capable of being operated from above the bulkhead deck. Where in addition to the main bilge pumping system an emergency bilge pumping system is provided, it shall be independent of the main system and so arranged that a pump is capable of operating on any compartment under flooding conditions; in that case only the cocks and valves necessary for the operation of the emergency system need be capable of being operated from above the bulkhead deck.
All cocks and valves mentioned in paragraph (l) of this Regulation which can be operated from above the bulkhead deck shall have their controls at their place of operation clearly marked and provided with means to indicate whether they are open or closed.

Regulation 19

STABILITY INFORMATION FOR PASSENGER SHIPS AND CARGO SHIPS

(a) Every passenger ship and cargo ship shall be inclined upon its completion and the elements of its stability determined. The master shall be supplied with such reliable information as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service, and a copy shall be furnished to the Administration.

(b) Where any alterations are made to a ship so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary the ship shall be re-inclined.

(c) The Administration may allow the inclining test of an individual ship to be dispensed with provided basic stability data are available from the inclining test of a sister ship and it is shown to the satisfaction of the Administration that reliable stability information for the exempted ship can be obtained from such basic data.

(d) The Administration may also allow the inclining test of an individual ship or class of ships, especially designed for the carriage of liquids or ore in bulk, to be dispensed with when reference to existing data for similar ships clearly indicate that due to the ship's proportions and arrangements more than sufficient metacentric height will be available in all probable loading conditions.

Regulation 20

DAMAGE CONTROL PLANS

There shall be permanently exhibited, for the guidance of the officer in charge of the ship, plans showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, booklets containing the aforementioned information shall be made available to the officers of the ship.

Regulation 21

MARKING, PERIODICAL OPERATION AND INSPECTION OF WATERTIGHT DOORS, &c.

(a) This Regulation applies to new and existing ships.

(b) Drills for the operating of watertight doors, sidescuttles, valves and closing mechanisms of scuppers, ash-shoots and rubbish-shoots shall take place weekly. In ships in which the voyage exceeds one week in duration a complete drill shall be held.
before leaving port, and others thereafter at least once a week during the voyage. In all ships all watertight power doors and hinged doors, in main transverse bulkheads, in use at sea, shall be operated daily.

(c) (i) The watertight doors and all mechanisms and indicators connected therewith, all valves the closing of which is necessary to make a compartment watertight, and all valves the operation of which is necessary for damage control cross connections shall be periodically inspected at sea at least once a week.

(ii) Such valves, doors and mechanisms shall be suitably marked to ensure that they may be properly used to provide maximum safety.

Regulation 22

ENTRIES IN LOG

(a) This Regulation applies to new and existing ships.

(b) Hinged doors, portable plates, sidescuttles, gangway, cargo and coaling ports and other openings, which are required by these Regulations to be kept closed during navigation, shall be closed before the ship leaves port. The time of closing and the time of opening (if permissible under these Regulations) shall be recorded in such log book as may be prescribed by the Administration.

(c) A record of all drills and inspections required by Regulation 21 of this Chapter shall be entered in the log book with an explicit record of any defects which may be disclosed.

Part C

MACHINERY AND ELECTRICAL INSTALLATIONS

(Part C applies to passenger ships and cargo ships)

Regulation 23

GENERAL

(a) Electrical installations in passenger ships shall be such that:

(i) services essential for safety will be maintained under various emergency conditions; and

(ii) the safety of passengers, crew and ship from electrical hazards will be assured.

(b) Cargo ships shall comply with Regulations 26, 27, 28, 29, 30 and 33 of this Chapter.
**Regulation 24**

**Main Source of Electrical Power in Passenger Ships**

(a) Every passenger ship, the electrical power of which constitutes the only means of maintaining the auxiliary services indispensable for the propulsion and the safety of the ship, shall be provided with at least two main generating sets. The power of these sets shall be such that it shall still be possible to ensure the functioning of the services referred to in subparagraph (a) (i) of Regulation 23 of this Chapter in the event of any one of these generating sets being stopped.

(b) In a passenger ship where there is only one main generating station, the main switchboard shall be located in the same main fire zone. Where there is more than one main generating station, it is permissible to have only one main switchboard.

**Regulation 25**

**Emergency Source of Electrical Power in Passenger Ships**

(a) There shall be above the bulkhead deck and outside the machinery casings a self-contained emergency source of electrical power. Its location in relation to the main source or sources of electrical power shall be such as to ensure to the satisfaction of the Administration that a fire or other casualty to the machinery space as defined in paragraph (h) of Regulation 2 of this Chapter will not interfere with the supply or distribution of emergency power. It shall not be forward of the collision bulkhead.

(b) The power available shall be sufficient to supply all those services that are, in the opinion of the Administration, necessary for the safety of the passengers and the crew in an emergency, due regard being paid to such services as may have to be operated simultaneously. Special consideration shall be given to emergency lighting at every boat station on deck and oversides, in all alleyways, stairways and exits, in the machinery spaces and in the control stations as defined in paragraph (i) of Regulation 35 of this Chapter, to the sprinkler pump, to navigation lights, and to the daylight signalling lamp if operated from the main source of power. The power shall be adequate for a period of 36 hours, except that, in the case of ships engaged regularly on voyages of short duration, the Administration may accept a lesser supply if satisfied that the same standard of safety would be attained.

(c) The emergency source of power may be either:

(i) a generator driven by a suitable prime-mover with an independent fuel supply and with approved starting arrangements; the fuel used shall have a flash point of not less than 110 °F. (or 43 °C.) ; or

(ii) an accumulator (storage) battery capable of carrying the emergency load without recharging or excessive voltage drop.

(d) (i) Where the emergency source of power is a generator there shall be provided a temporary source of emergency power consisting of an accumulator battery of sufficient capacity:

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(1) to supply emergency lighting continuously for half an hour;
(2) to close the watertight doors (if electrically operated) but not necessarily to close them all simultaneously;
(3) to operate the indicators (if electrically operated) which show whether power operated watertight doors are open or closed; and
(4) to operate the sound signals (if electrically operated) which give warning that power operated watertight doors are about to close.

The arrangements shall be such that the temporary source of emergency power will come into operation automatically in the event of failure of the main electrical supply.

(ii) Where the emergency source of power is an accumulator battery, arrangements shall be made to ensure that emergency lighting will automatically come into operation in the event of failure of the main lighting supply.

(e) An indicator shall be mounted in the machinery space, preferably on the main switchboard, to indicate when any accumulator battery fitted in accordance with this Regulation is being discharged.

(f) (i) The emergency switchboard shall be installed as near as is practicable to the emergency source of power.

(ii) Where the emergency source of power is a generator, the emergency switchboard shall be located in the same space as the emergency source of power, unless the operation of the emergency switchboard would thereby be impaired.

(iii) No accumulator battery fitted in accordance with this Regulation shall be installed in the same space as the emergency switchboard.

(iv) The Administration may permit the emergency switchboard to be supplied from the main switchboard in normal operation.

(g) Arrangements shall be such that the complete emergency installation will function when the ship is inclined 22°4 degrees and/or when the trim of the ship is 10 degrees.

(h) Provision shall be made for the periodic testing of the emergency source of power and the temporary source of power, if provided, which shall include the testing of automatic arrangements.

Regulation 26

Emergency Source of Electrical Power in Cargo Ships

(a) Cargo ships of 5,000 Tons Gross Tonnage and upwards

(i) In cargo ships of 5,000 tons gross tonnage and upwards there shall be a self-contained emergency source of power, located to the satisfaction of the Administration above the uppermost continuous deck and outside the machinery casings, to ensure its
functioning in the event of fire or other casualty causing failure to the main electrical installation.

(ii) The power available shall be sufficient to supply all those services which are, in the opinion of the Administration, necessary for the safety of all on board in an emergency, due regard being paid to such services as may have to be operated simultaneously. Special consideration shall be given to:

(1) emergency lighting at every boat station on deck and oversides, in all alleyways, stairways and exits, in the main machinery space and main generating set space, on the navigating bridge and in the chartroom;

(2) the general alarm; and

(3) navigation lights if solely electric, and the daylight signalling lamp if operated by the main source of electrical power.

The power shall be adequate for a period of 6 hours.

(iii) The emergency source of power may be either:

(1) an accumulator (storage) battery capable of carrying the emergency load without recharging or excessive voltage drop; or

(2) a generator driven by a suitable prime-mover with an independent fuel supply and with starting arrangements to the satisfaction of the Administration. The fuel used shall have a flash point of not less than 110 °F. (or 43 °C.).

(iv) Arrangements shall be such that the complete emergency installation will function when the ship is inclined 22½ degrees and/or when the trim of the ship is 10 degrees.

(v) Provision shall be made for the periodic testing of the complete emergency installation.

(b) Cargo ships of less than 5,000 Tons Gross Tonnage

(i) In cargo ships of less than 5,000 tons gross tonnage there shall be a self-contained emergency source of power located to the satisfaction of the Administration, and capable of supplying the illumination at launching stations and stowage positions of survival craft prescribed in sub-paragraphs (a) (ii), (b) (ii) and (b) (iii) of Regulation 19 of Chapter III, and in addition such other services as the Administration may require, due regard being paid to Regulation 38 of Chapter III.

(ii) The power available shall be adequate for a period of at least 3 hours.

(iii) These ships shall also be subject to sub-paragraphs (iii), (iv), and (v) of paragraph (a) of this Regulation.
Precautions against Shock, Fire and Other Hazards of Electrical Origin

(a) Passenger Ships and Cargo Ships

(i) (1) All exposed metal parts of electrical machines or equipment which are not intended to be "live", but are liable to become "live" under fault conditions, shall be earthed (grounded); and all electrical apparatus shall be so constructed and so installed that danger of injury in ordinary handling shall not exist.

(2) Metal frames of all portable electric lamps, tools and similar apparatus, supplied as ship's equipment and rated in excess of a safety voltage to be prescribed by the Administration shall be earthed (grounded) through a suitable conductor, unless equivalent provisions are made such as by double insulation or by an isolating transformer. The Administration may require additional special precautions for electric lamps, tools or similar apparatus for use in damp spaces.

(ii) Main and emergency switchboards shall be so arranged as to give easy access back and front, without danger to attendants. The sides and backs and, where necessary, the fronts of switchboards shall be suitably guarded. There shall be non-conducting mats or gratings front and rear where necessary. Exposed current carrying parts at voltages to earth (ground) exceeding a voltage to be specified by the Administration shall not be installed on the face of any switchboard or control panel.

(iii) (1) Where the hull return system of distribution is used, special precautions shall be taken to the satisfaction of the Administration.

(2) Hull return shall not be used in tankers.

(iv) (1) All metal sheaths and armour of cables shall be electrically continuous and shall be earthed (grounded).

(2) Where the cables are neither sheathed nor armoured and there might be a risk of fire in the event of an electrical fault, precautions shall be required by the Administration.

(v) Lighting fittings shall be arranged to prevent temperature rises that would be injurious to the wiring, and to prevent surrounding material from becoming excessively hot.

(vi) Wiring shall be supported in such a manner as to avoid chafing or other injury.

(vii) Each separate circuit shall be protected against short circuit. Each separate circuit shall also be protected against overload, except in accordance with Regulation 30 of this Chapter or where the Administration grants an exemption. The current-carrying
capacity of each circuit shall be permanently indicated, together with the rating or setting of the appropriate overload protective device.

(viii) Accumulator batteries shall be suitably housed, and compartments used primarily for their accommodation shall be properly constructed and efficiently ventilated.

(b) *Passenger Ships only*

(i) Distribution systems shall be so arranged that fire in any main fire zone will not interfere with essential services in any other main fire zone. This requirement will be met if main and emergency feeders passing through any zone are separated both vertically and horizontally as widely as is practicable.

(ii) Electric cables shall be of a flame retarding type to the satisfaction of the Administration. The Administration may require additional safeguards for electric cables in particular spaces of the ship with a view to the prevention of fire or explosion.

(iii) In spaces where inflammable mixtures are liable to collect, no electrical equipment shall be installed unless it is of a type which will not ignite the mixture concerned, such as flameproof (explosion proof) equipment.

(iv) A lighting circuit in a bunker or hold shall be provided with an isolating switch outside the space.

(v) Joints in all conductors except for low voltage communication circuits shall be made only in junction or outlet boxes. All such boxes or wiring devices shall be so constructed as to prevent the spread of fire from the box or device. Where splicing is employed, it shall only be by an approved method such that it retains the original mechanical and electrical properties of the cable.

(c) *Cargo Ships only*

Devices liable to arc shall not be installed in any compartment assigned principally to accumulator batteries unless the devices are flameproof (explosion proof).

*Regulation 28*

**Means of Going Asten**

(a) *Passenger Ships and Cargo Ships*

Ships shall have sufficient power for going astern to secure proper control of the ship in all normal circumstances.
(b) Passenger Ships only

The ability of the machinery to reverse the direction of thrust of the propeller in sufficient time, under normal manoeuvring conditions, and so to bring the ship to rest from maximum ahead service speed shall be demonstrated at the initial survey.

Regulation 29

STEERING GEAR

(a) Passenger Ships and Cargo Ships

(i) Ships shall be provided with a main steering gear and an auxiliary steering gear to the satisfaction of the Administration.

(ii) The main steering gear shall be of adequate strength and sufficient to steer the ship at maximum service speed. The main steering gear and rudder stock shall be so designed that they are not damaged at maximum astern speed.

(iii) The auxiliary steering gear shall be of adequate strength and sufficient to steer the ship at navigable speed and capable of being brought speedily into action in an emergency.

(iv) The exact position of the rudder, if power operated, shall be indicated at the principal steering station.

(b) Passenger Ships only

(i) The main steering gear shall be capable of putting the rudder over from 35 degrees on one side to 35 degrees on the other side with the ship running ahead at maximum service speed. The rudder shall be capable of being put over from 35 degrees on either side to 30 degrees on the other side in 28 seconds at maximum service speed.

(ii) The auxiliary steering gear shall be operated by power in any case in which the Administration would require a rudder stock of over 9 inches (or 22.86 centimetres) diameter in way of the tiller.

(iii) Where main steering gear power units and their connections are fitted in duplicate to the satisfaction of the Administration, and each power unit enables the steering gear to meet the requirements of sub-paragraph (i) of this paragraph, no auxiliary steering gear need be required.

(iv) Where the Administration would require a rudder stock with a diameter in way of the tiller exceeding 9 inches (or 22.86 centimetres) there shall be provided an alternative steering station located to the satisfaction of the Administration. The remote steering control systems from the principal and alternative steering stations shall be so arranged to the satisfaction of the Administration that failure of either system would not result in inability to steer the ship by means of the other system.

(v) Means satisfactory to the Administration shall be provided to enable orders to be transmitted from the bridge to the alternative steering station.
(c) **Cargo Ships only**

(i) The auxiliary steering gear shall be operated by power in any case in which the Administration would require a rudder stock of over 14 inches (or 35.56 centimetres) diameter in way of the tiller.

(ii) Where power operated steering gear units and connections are fitted in duplicate to the satisfaction of the Administration, and each unit complies with sub-paragraph (iii) of paragraph (a) of this Regulation, no auxiliary steering gear need be required, provided that the duplicate units and connections operating together comply with sub-paragraph (ii) of paragraph (a) of this Regulation.

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**Regulation 30**

**Electric and Electrohydraulic Steering Gear**

(a) **Passenger Ships and Cargo Ships**

Indicators for running indication of the motors of electric and electrohydraulic steering gear shall be installed in a suitable location to the satisfaction of the Administration.

(b) **All Passenger Ships (irrespective of tonnage) and Cargo Ships of 5,000 Tons Gross Tonnage and upwards**

(i) Electric and electrohydraulic steering gear shall be served by two circuits fed from the main switchboard. One of the circuits may pass through the emergency switchboard, if provided. Each circuit shall have adequate capacity for supplying all the motors which are normally connected to it and which operate simultaneously. If transfer arrangements are provided in the steering gear room to permit either circuit to supply any motor or combination of motors, the capacity of each circuit shall be adequate for the most severe load condition. The circuits shall be separated throughout their length as widely as is practicable.

(ii) Short circuit protection only shall be provided for these circuits and motors.

(c) **Cargo Ships of less than 5,000 Tons Gross Tonnage**

(i) Cargo ships in which electrical power is the sole source of power for both main and auxiliary steering gear shall comply with sub-paragraphs (i) and (ii) of paragraph (b) of this Regulation, except that if the auxiliary steering gear is powered by a motor primarily intended for other services, paragraph (b) (ii) may be waived, provided that the Administration is satisfied with the protection arrangements.

(ii) Short circuit protection only shall be provided for motors and power circuits of electrically or electrohydraulically operated main steering gear.
Regulation 31

OIL FUEL USED IN PASSENGER SHIPS

No internal combustion engine shall be used for any fixed installation in a passenger ship if its fuel has a flash point of 110°F. (or 43°C.) or less.

Regulation 32

LOCATION OF EMERGENCY INSTALLATIONS IN PASSENGER SHIPS

The emergency source of electrical power, emergency fire pumps, emergency bilge pumps, batteries of carbon dioxide bottles for fire extinguishing purposes and other emergency installations which are essential for the safety of the ship shall not be installed in a passenger ship forward of the collision bulkhead.

Regulation 33

COMMUNICATION BETWEEN BRIDGE AND ENGINE ROOM

Ships shall be fitted with two means of communicating orders from the bridge to the engine room. One means shall be an engine room telegraph.

Part D

FIRE PROTECTION

(In Part D, Regulations 34 to 52 apply to passenger ships carrying more than 36 passengers; Regulations 35 and 53 apply to passenger ships carrying not more than 36 passengers; Regulations 35 and 54 apply to cargo ships of 4,000 tons gross tonnage and upwards.)

Regulation 34

GENERAL

(a) The purpose of this Part is to require the fullest practicable degree of protection from fire by regulation of the details of arrangement and construction. The three basic principles underlying these regulations are:

(i) separation of the accommodation spaces from the remainder of the ship by thermal and structural boundaries;

(ii) containment, extinction, or detection of any fire in the space of origin;

(iii) protection of means of escape.

(b) The hull, superstructure and deck houses shall be divided into main vertical zones by "A" Class bulkheads (as described in paragraph (c) of Regulation 35 of this Chapter) and further divided by similar bulkheads forming the boundaries protecting spaces which provide vertical access and the boundaries separating the accommodation spaces
from the machinery, cargo and service spaces and others. In addition, and supplementary to the patrol systems, alarm systems and fire extinguishing apparatus required by Part E of this Chapter, either of the following methods of protection, or a combination of these methods to the satisfaction of the Administration, shall be adopted in accommodation and service spaces with a view to preventing the spread of incipient fires from the spaces of their origin:

**Method I.**—The construction of internal divisional bulkheading of "B" Class divisions (as defined in paragraph (d) of Regulation 35 of this Chapter) generally without the installation of a detection or sprinkler system in the accommodation and service spaces; or

**Method II.**—The fitting of an automatic sprinkler and fire alarm system for the detection and extinction of fire in all spaces in which a fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheading in spaces so protected; or

**Method III.**—A system of subdivision within each main vertical zone using "A" and "B" Class divisions distributed according to the importance, size and nature of the various compartments, with an automatic fire detection system in all spaces in which a fire might be expected to originate, and with restricted use of combustible and highly inflammable materials and furnishings; but generally without the installation of a sprinkler system.

Where appropriate, the headings or sub-headings of the Regulations of this Part of this Chapter indicate under which Method or Methods the Regulation is a requirement.

**Regulation 35**

**Definitions**

Wherever the phrases defined below occur throughout this Part of this Chapter, they shall be interpreted in accordance with the following definitions:

(a) *Incombustible Material* means a material which neither burns nor gives off inflammable vapours in sufficient quantity to ignite at a pilot flame when heated to approximately 1,382°F. (or 750°C.). Any other material is a "Combustible Material".

(b) A *Standard Fire Test* is one in which specimens of the relevant bulkheads or decks, having a surface of approximately 50 square feet (or 4.65 square metres) and height of 8 feet (or 2.44 metres) resembling as closely as possible the intended construction and including where appropriate at least one joint, are exposed in a test furnace to a series of time temperature relationships, approximately as follows:

- at the end of the first 5 minutes—1,000°F. (or 538°C.)
- at the end of the first 10 minutes—1,300°F. (or 704°C.)
- at the end of the first 30 minutes—1,550°F. (or 843°C.)
- at the end of the first 60 minutes—1,700°F. (or 927°C.)
(c) "A" Class or Fire-resisting Divisions are those divisions formed by bulkheads and decks which comply with the following:

(i) they shall be constructed of steel or other equivalent material;

(ii) they shall be suitably stiffened;

(iii) they shall be so constructed as to be capable of preventing the passage of smoke and flame up to the end of the one-hour standard fire test;

(iv) they shall have an insulating value to the satisfaction of the Administration, having regard to the nature of the adjacent spaces. In general, where such bulkheads and decks are required to form fire-resisting divisions between spaces either of which contains adjacent woodwork, wood lining, or other combustible material, they shall be so insulated that, if either face is exposed to the standard fire test for one hour, the average temperature on the unexposed face will not increase at any time during the test by more than 250°F. (or 139°C.) above the initial temperature nor shall the temperature at any point on the face, including any joint, rise more than 325°F. (or 180°C.) above the initial temperature. Reduced amounts of insulation or none at all may be provided where in the opinion of the Administration a reduced fire hazard is present. The Administration may require a test of an assembled prototype bulkhead or deck to ensure that it meets the above requirements for integrity and temperature rise.

(d) "B" Class or Fire-retarding Divisions are those divisions formed by bulkheads which are so constructed that they will be capable of preventing the passage of flame up to the end of the first one-half hour of the standard fire test. In addition they shall have an insulating value to the satisfaction of the Administration, having regard to the nature of the adjacent spaces. In general, where such bulkheads are required to form fire-retarding divisions between spaces, they shall be of such material that, if either face is exposed for the first one-half hour period of the standard fire test, the average temperature on the unexposed face will not increase at any time during the test by more than 250°F. (or 139°C.) above the initial temperature, nor shall the temperature at any point on the face including any joint rise more than 405°F. (or 225°C.) above the initial temperature. For panels which are of incombustible materials it will only be necessary to comply with the above temperature rise limitation during the first 15-minute period of the standard fire test, but the test shall be continued to the end of the one-half hour to test the panel's integrity in the usual manner. All materials entering into the construction and erection of incombustible "B" Class divisions shall themselves be of incombustible material. Reduced amounts of insulation or none at all may be provided where in the opinion of the Administration a reduced fire hazard is present. The Administration may require a test of an assembled prototype bulkhead to ensure that it meets the above requirements for integrity and temperature rise.
(e) Main Vertical Zones are those sections into which the hull, superstructure, and deck houses are divided by "A" Class divisions, the mean length of which on any one deck does not, in general, exceed 131 feet (or 40 metres).

(f) Control Stations are those spaces in which radio, main navigating or central fire-recording equipment or the emergency generator is located.

(g) Accommodation Spaces are those used for public spaces, corridors, lavatories, cabins, offices, crew quarters, barber shops, isolated pantries and lockers and similar spaces.

(h) Public Spaces are those portions of the accommodation which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

(i) Service Spaces are those used for galleys, main pantries, stores (except isolated pantries and lockers), mail and specie rooms and similar spaces and trunks to such spaces.

(j) Cargo Spaces are all spaces used for cargo (including cargo oil tanks) and trunks to such spaces.

(k) Machinery Spaces include all spaces used for propelling, auxiliary or refrigerating machinery, boilers, pumps, workshops, generators, ventilation and air conditioning machinery, oil filling stations and similar spaces and trunks to such spaces.

(l) Steel or Other Equivalent Material.—Where the words "steel or other equivalent material" occur, "equivalent material" means any material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable fire exposure (e.g., aluminium with appropriate insulation).

(m) Low flame spread means that the surface thus described will adequately restrict the spread of flame having regard to the risk of fire in the spaces concerned, this being determined to the satisfaction of the Administration by a suitably established test procedure.

Regulation 36

STRUCTURE (METHODS I, II AND III)

(a) Method I

The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material.

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(b) **Method II**

(i) The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material.

(ii) Where fire protection in accordance with Method II is employed, the superstructure may be constructed of, for example, aluminium alloy, provided that:

(1) the temperature rise of the metallic cores of the "A" Class divisions, when exposed to the standard fire test, shall have regard to the mechanical properties of the material;

(2) an automatic sprinkler system complying with paragraph (g) of Regulation 59 of this Chapter is installed;

(3) adequate provision is made to ensure that in the event of fire, arrangements for stowage, launching and embarkation into survival craft remain as effective as if the superstructure were constructed of steel;

(4) crowns and casings of boiler and machinery spaces are of steel construction adequately insulated, and the openings therein, if any, are suitably arranged and protected to prevent spread of fire.

(c) **Method III**

(i) The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material.

(ii) Where fire protection in accordance with Method III is employed, the superstructure may be constructed of, for example, aluminium alloy, provided that:

(1) the temperature rise of the metallic cores of the "A" Class divisions, when exposed to the standard fire test, shall have regard to the mechanical properties of the material;

(2) the Administration shall be satisfied that the amount of combustible materials used in the relevant part of the ship is suitably reduced. Ceilings (i.e., linings of deck heads) shall be incombustible;

(3) adequate provision is made to ensure that in the event of fire, arrangements for stowage, launching and embarkation into survival craft remain as effective as if the superstructure were constructed of steel;

(4) crowns and casings of boiler and machinery spaces are of steel construction adequately insulated, and the openings therein, if any, are suitably arranged and protected to prevent spread of fire.

**Regulation 37**

**MAIN VERTICAL ZONES (METHODS I, II AND III)**

(a) The hull, superstructure and deckhouses shall be subdivided into main vertical zones. Steps and recesses shall be kept to a minimum, but where they are necessary, they shall be of "A" Class divisions.
(b) As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck.

(c) Such bulkheads shall extend from deck to deck and to the shell or other boundaries.

(d) On ships designed for special purposes, such as automobile or railroad car ferries, where installation of such bulkheads would defeat the purpose for which the ship is intended, equivalent means for controlling and limiting a fire shall be substituted and specifically approved by the Administration.

Regulation 38

Openings in “A” Class Divisions (Methods I, II and III)

(a) Where “A” Class divisions are pierced for the passage of electric cables, pipes, trunks, ducts &c. for girders, beams or other structures, arrangements shall be made to ensure that the fire resistance is not impaired.

(b) Dampers are to be fitted in ventilation trunks and ducts passing through main vertical zone bulkheads, and shall be fitted with suitable local control capable of being operated from both sides of the bulkhead. The operating positions shall be readily accessible and marked in red. Indicators shall be fitted to show whether the dampers are open or shut.

(c) Except for tonnage openings and for hatches between cargo, store, and baggage spaces, and between such spaces and the weather decks, all openings shall be provided with permanently attached means of closing which shall be at least as effective for resisting fires as the divisions in which they are fitted. Where “A” Class divisions are pierced by tonnage openings the means of closure shall be by steel plates.

(d) The construction of all doors and door frames in “A” Class divisions, with the means of securing them when closed, shall provide resistance to fire as well as to the passage of smoke and flame as far as practicable equivalent to that of the bulkheads in which the doors are situated. Watertight doors need not be insulated.

(e) It shall be possible for each door to be opened from either side of the bulkhead by one person only. Fire doors in main vertical zone bulkheads other than watertight doors shall be of the self-closing type with simple and easy means of release from the open position. These doors shall be of approved types and designs, and the self-closing mechanism shall be capable of closing the door against an inclination of 3½ degrees opposing closure.

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Regulation 39

Bulkheads within Main Vertical Zones (Methods I and III)

(a) Method I

(i) Within the accommodation spaces, all enclosure bulkheads, other than those required to be of "A" Class divisions, shall be constructed of "B" Class divisions of incombustible materials, which may, however, be faced with combustible materials in accordance with Regulation 48 of this Chapter. All doorways and similar openings shall have a method of closure consistent with the type of bulkhead in which they are situated.

(ii) All corridor bulkheads shall extend from deck to deck. Ventilation openings may be permitted in the doors in "B" Class bulkheads, preferably in the lower portion. All other enclosure bulkheads shall extend from deck to deck vertically, and to the shell or other boundaries transversely, unless incombustible ceilings or linings such as will ensure fire integrity are fitted, in which case the bulkheads may terminate at the ceilings or linings.

(b) Method III

(i) Within the accommodation spaces, enclosure bulkheads other than those required to be of "A" Class divisions shall be constructed of "B" Class divisions, and shall be of incombustible materials which may, however, be faced with combustible materials in accordance with Regulation 48 of this Chapter. These bulkheads shall form a continuous network of fire-retarding bulkheads within which the area of any one compartment shall not in general exceed 1,300 square feet (or 120 square metres) with a maximum of 1,600 square feet (or 150 square metres); they shall extend from deck to deck. All doorways and similar openings shall have a method of closure consistent with the type of bulkhead in which they are situated.

(ii) Each public space larger than 1,600 square feet (or 150 square metres) shall be surrounded by "B" Class divisions of incombustible materials.

(iii) The insulation of "A" Class and "B" Class divisions, except those constituting the separation of the main vertical zones, the control stations, the stairway enclosures, and the corridors, may be omitted when the divisions constitute the outside part of the ship or when the adjoining compartment does not contain fire hazard.

(iv) All corridor bulkheads shall be of "B" Class divisions and shall extend from deck to deck. Ceilings, if fitted, shall be of incombustible materials. Ventilation openings may be permitted in doors, preferably in the lower portion. All other partition bulkheads shall also extend from deck to deck vertically and to the shell or other boundaries transversely, unless incombustible ceilings or linings are fitted, in which case the bulkheads may terminate at the ceilings or linings.
(v) "B" Class divisions other than those required to be of the incombustible type shall have incombustible cores or be of an assembled type having internal layers of sheet asbestos or similar incombustible material. The Administration may, however, approve other materials without incombustible cores, provided that equivalent fire-retarding properties are ensured.

**Regulation 40**

**Separation of Accommodation Spaces from Machinery, Cargo and Service Spaces (Methods I, II and III)**

The boundary bulkheads and decks separating accommodation spaces from machinery, cargo and service spaces shall be constructed as "A" Class divisions, and these bulkheads and decks shall have an insulation value to the satisfaction of the Administration having regard to the nature of the adjacent spaces.

**Regulation 41**

**Deck Coverings (Methods I, II and III)**

Primary deck coverings within accommodation spaces, control stations, stairways and corridors shall be of approved material which will not readily ignite.

**Regulation 42**

**Protection of Stairways in Accommodation and Service Spaces (Methods I, II and III)**

(a) *Methods I and III*

(i) All stairways shall be of steel frame construction, except where the Administration sanctions the use of other equivalent material, and shall be within enclosures formed of "A" Class divisions, with positive means of closure at all openings from the lowest accommodation deck at least to a level which is directly accessible to the open deck, except that:

(1) a stairway connecting only two decks need not be enclosed, provided the integrity of the deck is maintained by proper bulkheads or doors at one level;

(2) stairways may be fitted in the open in a public space, provided they lie wholly within such public space.

(ii) Stairway enclosures shall have direct communication with the corridors and be of sufficient area to prevent congestion having in view the number of persons likely to use them in an emergency, and shall contain as little accommodation or other enclosed space in which a fire may originate as practicable.
(iii) Stairway enclosure bulkheads shall have an insulation value to the satisfaction of the Administration, having regard to the nature of the adjacent spaces. The means for closure at openings in stairway enclosures shall be at least as effective for resisting fire as the bulkheads in which they are fitted. Doors other than watertight doors shall be of the self-closing type, as required for the main vertical zone bulkheads, in accordance with Regulation 38 of this Chapter.

(b) Method II

(i) Main stairways shall be of steel frame construction, except where the Administration sanctions the use of other suitable materials which, together with such supplementary fire protection and/or extinction arrangements as would, in the opinion of the Administration, be equivalent to such construction, and shall be within enclosures formed of “A” Class divisions with positive means of closure at all openings from the lowest accommodation deck at least to a level which is directly accessible to the open deck except that:

(1) a stairway connecting only two decks need not be enclosed, provided the integrity of the deck is maintained by proper bulkheads or doors at one level;

(2) stairways may be fitted in the open in a public space, provided they lie wholly within such public space.

(ii) Stairway enclosures shall have direct communication with the corridors and be of sufficient area to prevent congestion having in view the number of persons likely to use them in an emergency, and shall contain as little accommodation or other enclosed space in which a fire may originate as practicable.

(iii) Stairway enclosure bulkheads shall have an insulation value to the satisfaction of the Administration having regard to the nature of the adjacent spaces. The means for closure at openings in stairway enclosures shall be at least as effective for resisting fire as the bulkheads in which they are fitted. Doors other than watertight doors shall be of the self-closing type as required for the main vertical zone bulkheads, in accordance with Regulation 38 of this Chapter.

(iv) Auxiliary stairways, namely those which do not form part of the means of escape required by Regulation 68 of this Chapter and which connect only two decks, shall be of steel frame construction, except where the Administration sanctions the use of other suitable material in special cases, but need not be within enclosures, provided the integrity of the deck is maintained by the fitting of sprinklers at the auxiliary stairways.
Regulation 43

Protection of Lifts (Passenger and Service), Vertical Trunks for Light and Air, &c., in Accommodation and Service Spaces (Methods I, II and III)

(a) Passenger and service lift trunks, vertical trunks for light and air to passenger spaces, &c., shall be of "A" Class divisions. Doors shall be of steel or other equivalent material and when closed shall provide fire-resistance at least as effective as the trunks in which they are fitted.

(b) Lift trunks shall be so fitted as to prevent the passage of smoke and flame from one between deck to another and shall be provided with means of closing so as to permit of draught and smoke control. The insulation of lift trunks which are within stairway enclosures shall not be compulsory.

(c) Where a trunk for light and air communicates with more than one between deck space, and, in the opinion of the Administration, smoke and flame are likely to be conducted from one between deck to another, smoke shutters, suitably placed, shall be fitted so that each space can be isolated in case of fire.

(d) Any other trunks (e.g., for electric cables) shall be so constructed as not to afford passage for fire from one between deck or compartment to another.

Regulation 44

Protection of Control Stations (Methods I, II and III)

Control stations shall be separated from the remainder of the ship by "A" Class bulkheads and decks.

Regulation 45

Protection of Store Rooms, &c. (Methods I, II and III)

The boundary bulkheads of baggage rooms, mail rooms, store rooms, paint and lamp lockers, galleys and similar spaces shall be of "A" Class divisions. Spaces containing highly inflammable stores shall be so situated as to minimise the danger to passengers or crew in the event of fire.

Regulation 46

Windows and Sidescuttles (Methods I, II and III)

(a) All windows and sidescuttles in bulkheads separating accommodation spaces and weather shall be constructed with frames of steel or other suitable material. The glass shall be retained by a metal glazing bead.

(b) All windows and sidescuttles in bulkheads within accommodation spaces shall be constructed so as to preserve the integrity requirements of the type of bulkhead in which they are fitted.
(c) In spaces containing (1) main propulsion machinery, or (2) oil-fired boilers, or (3) auxiliary internal combustion type machinery of total horsepower of 1,000 or over, the following measures shall be taken:

(i) skylights shall be capable of being closed from outside the space;
(ii) skylights containing glass panels shall be fitted with external shutters of steel or other equivalent material permanently attached;
(iii) any window permitted by the Administration in casings of such spaces shall be of the non-opening type, and shall be fitted with an external shutter of steel or other equivalent material permanently attached;
(iv) in the windows and skylights referred to in sub-paragraphs (i), (ii) and (iii) of this paragraph, wire reinforced glass shall be used.

Regulation 47

VENTILATION SYSTEMS (METHODS I, II AND III)

(a) The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the space in the event of a fire. In general, the ventilation fans shall be so disposed that the ducts reaching the various spaces remain within the main vertical zone.

(b) All power ventilation, except cargo and machinery space ventilation and any alternative system which may be required under paragraph (d) of this Regulation, shall be fitted with master controls so that all fans may be stopped from either of two separate positions which shall be situated as far apart as practicable. Two master controls shall be provided for the power ventilation serving machinery spaces, one of which shall be operable from a position outside the machinery space.

(c) Efficient insulation shall be provided for exhaust ducts from galley ranges where the ducts pass through accommodation spaces.

(d) Such measures as are practicable shall be taken in respect of control stations situated below deck and outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained, so that in the event of fire the machinery and equipment contained therein may be supervised and continue to function effectively. Alternative and entirely separate means of air supply shall be provided for these control stations; air inlets to the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimised. At the discretion of the Administration, such requirements need not apply to spaces situated on, and opening on to, an open deck, or where local closing arrangements would be equally effective.
Regulation 48

DETAILS OF CONSTRUCTION (METHODS I AND III)

(a) Method I

Except in cargo spaces, mail rooms, baggage rooms, or refrigerated compartments of service spaces, all linings, grounds, ceilings and insulations shall be of incombustible materials. The total volume of combustible facings, mouldings, decorations and veneers in any accommodation or public space shall not exceed a volume equivalent to one-tenth inch (or 2.54 millimetres) veneer on the combined area of the walls and ceiling. All exposed surfaces in corridors or stairway enclosures and in concealed or inaccessible spaces shall have low flame spread characteristics.

(b) Method III

The use of combustible materials of all kinds such as untreated wood, veneers, ceilings, curtains, carpets, &c. shall be reduced in so far as it is reasonable and practicable. In large public spaces, the grounds and supports to the linings and ceilings shall be of steel or equivalent material. All exposed surfaces in corridors or stairway enclosures and in concealed or inaccessible spaces shall have low flame spread characteristics.

Regulation 49

MISCELLANEOUS ITEMS (METHODS I, II AND III)

Requirements applicable to all parts of the ship

(a) Paints, varnishes and similar preparations having a nitro-cellulose or other highly inflammable base shall not be used.

(b) Pipes penetrating "A" or "B" Class divisions shall be of a material approved by the Administration having regard to the temperature such divisions are required to withstand. Pipes conveying oil or combustible liquids shall be of a material approved by the Administration having regard to the fire risk. Materials readily rendered ineffective by heat shall not be used for overhead scuppers, sanitary discharges, and other outlets which are close to the water line and where the failure of the material in the event of fire would give rise to danger of flooding.

Requirements applicable to accommodation and service spaces

(c) (i) Air spaces enclosed behind ceilings, panellings or linings shall be suitably divided by close-fitting draught stops not more than 45 feet (or 13.73 metres) apart.

(ii) In the vertical direction, such spaces, including those behind linings of stairways, trunks, &c., shall be closed at each deck.

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(d) The construction of ceiling and bulkheading shall be such that it will be possible, without impairing the efficiency of the fire protection, for the fire patrols to detect any smoke originating in concealed and inaccessible places, except where in the opinion of the Administration there is no risk of fire originating in such places.

(e) The concealed surfaces of all bulkheads, linings, panellings, stairways, wood grounds, &c., in accommodation spaces shall have low flame spread characteristics.

(f) Electric radiators, if used, must be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiators shall be fitted with an element so exposed that clothing, curtains, or other similar materials can be scorched or set on fire by heat from the element.

Regulation 50

CINEMATOGRAPH FILM (METHODS I, II AND III)

Cellulose-based film shall not be used in cinematograph installations on board ship.

Regulation 51

AUTOMATIC SPRINKLER AND FIRE ALARM AND DETECTION SYSTEMS (METHOD II)

In ships in which Method II is adopted, an automatic sprinkler and fire alarm system of an approved type and complying with the requirements of Regulation 59 of this Chapter shall be installed and so arranged as to protect all enclosed spaces appropriated to the use or service of passengers or crew, except spaces which afford no substantial fire risk.

Regulation 52

AUTOMATIC FIRE ALARM AND FIRE DETECTION SYSTEMS (METHOD III)

In ships in which Method III is adopted, a fire-detecting system of an approved type shall be installed and so arranged as to detect the presence of fire in all enclosed spaces appropriated to the use or service of passengers or crew (except spaces which afford no substantial fire hazard) and automatically to indicate at one or more points or stations where it can be most quickly observed by officers and crew, the presence or indication of fire and also its location.
**Regulation 53**

**Passenger Ships carrying not more than 36 Passengers**

(a) In addition to being subject to the provisions of Regulation 35 of this Chapter, ships carrying not more than 36 passengers shall comply with Regulations 36, 37, 38, 40, 41, 43 (a), 44, 45, 46, 49 (a), (b) and (f) and 50 of this Chapter. Where insulated "A" Class divisions are required under the aforementioned Regulations, the Administration may agree to a reduction of the amount of insulation below that envisaged by sub-paragraph (c) (iv) of Regulation 35 of this Chapter.

(b) In addition to compliance with the Regulations referred to in paragraph (a), the following provisions shall apply:

(i) all stairways and means of escape in accommodation and service spaces shall be of steel or other suitable material;

(ii) power ventilation of machinery spaces shall be capable of being stopped from an easily accessible position outside the machinery spaces;

(iii) except where all enclosure bulkheads in accommodation spaces conform with the requirements of Regulations 39 (a) and 48 (a) of this Chapter, such ships shall be provided with an automatic fire detection system conforming with Regulation 52 of this Chapter and in accommodation spaces, the corridor bulkheads shall be of steel or be constructed of "B" Class panels.

**Regulation 54**

**Cargo Ships of 4,000 tons Gross Tonnage and Upwards**

(a) The hull, superstructure, structural bulkheads, decks and deck houses shall be constructed of steel, except where the Administration may sanction the use of other suitable material in special cases, having in mind the risk of fire.

(b) In accommodation spaces, the corridor bulkheads shall be of steel or be constructed of "B" Class panels.

(c) Deck coverings within accommodation spaces on the decks forming the crown of machinery and cargo spaces shall be of a type which will not readily ignite.

(d) Interior stairways below the weather deck shall be of steel or other suitable material. Crew lift trunks within accommodation shall be of steel or equivalent material.

(e) Bulkheads of galleys, paint stores, lamprooms, boatswain's stores when adjacent to accommodation spaces and emergency generator rooms if any, shall be of steel or equivalent material.

(f) In accommodation and machinery spaces, paints, varnishes and similar preparations having a nitro-cellulose or other highly inflammable base shall not be used.
(g) Pipes conveying oil or combustible liquids shall be of a material approved by
the Administration having regard to the fire risk. Materials readily rendered ineffective
by heat shall not be used for overboard scuppers, sanitary discharges, and other outlets
which are close to the water line and where the failure of the material in the event of
fire would give rise to danger of flooding.

(h) Electric radiators, if used, must be fixed in position and so constructed as to
reduce fire risks to a minimum. No such radiators shall be fitted with an element so
exposed that clothing, curtains or other similar materials can be scorched or set on fire
by heat from the element.

(i) Cellulose-based film shall not be used in cinematograph installations on board
ship.

(j) Power ventilation of machinery spaces shall be capable of being stopped from an
easily accessible position outside the machinery spaces.

Part E

FIRE DETECTION AND EXTINCTION IN PASSENGER
SHIPS AND CARGO SHIPS

(Part E applies to passenger ships and cargo ships except that Regulations 59 and
64 apply only to passenger ships and Regulation 65 applies only to cargo ships.)

NOTE.—Regulations 56 to 63 inclusive set forth the conditions with which the appliances
mentioned in Regulations 64 and 65 are required to comply.

Regulation 55

DEFINITIONS

In this Part of this Chapter, unless expressly provided otherwise:

(a) The length of the ship is the length measured between perpendiculars.

(b) Required means required by this Part of this Chapter.

Regulation 56

PUMPS, WATER SERVICE PIPES, HYDRANTS AND HOSES

(a) Total Capacity of Fire Pumps

(i) In a passenger ship, the required fire pumps shall be capable of delivering for fire
fighting purposes a quantity of water, at the appropriate pressure prescribed below, not
less than two-thirds of the quantity required to be dealt with by the bilge pumps when
employed for bilge pumping.
(ii) In a cargo ship, the required fire pumps, other than the emergency pump (if any), shall be capable of delivering for firefighting purposes a quantity of water, at the appropriate pressure prescribed, not less than four-thirds of the quantity required under Regulation 18 of this Chapter to be dealt with by each of the independent bilge pumps in a passenger ship of the same dimensions, when employed on bilge pumping. In place of the definitions covering L, B and D referred to in paragraph (i) of Regulation 18 of this Chapter, the following shall apply:

\[
\begin{align*}
L &= \text{length between perpendicul\'ars.} \\
B &= \text{greatest moulded breadth.} \\
D &= \text{depth to bulkhead deck amidships.}
\end{align*}
\]

Provided that in no cargo ship need the total required capacity of the fire pumps exceed 180 tons per hour.

(b) Fire Pumps

(i) The fire pumps shall be independently driven. Sanitary, ballast, bilge or general service pumps may be accepted as fire pumps, provided that they are not normally used for pumping oil and that if they are subject to occasional duty for the transfer or pumping of fuel oil, suitable change-over arrangements are fitted.

(ii) Each of the required fire pumps (other than any emergency pump required by Regulation 65 of this Chapter) shall have a capacity not less than 80 per cent. of the total required capacity divided by the number of required fire pumps—and shall in any event be capable of delivering at least the two required jets of water. These fire pumps shall be capable of supplying the fire main system under the required conditions.

Where more pumps than required are installed their capacity shall be to the satisfaction of the Administration.

(iii) Relief valves shall be provided in conjunction with all fire pumps if the pumps are capable of developing a pressure exceeding the design pressure of the water service pipes, hydrants and hoses. These valves shall be so placed and adjusted as to prevent excessive pressure in any part of the fire main system.

(c) Pressure in the Fire Main

(i) The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously, except that in the case of cargo ships the diameter need only be sufficient for the discharge of 140 tons per hour.

(ii) With the two pumps simultaneously delivering through nozzles specified in paragraph (g) of this Regulation, the quantity of water specified in subparagraph (i) of this paragraph, through any adjacent hydrants, the following minimum pressures shall be maintained at all hydrants:

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Passenger ships

4,000 tons gross tonnage and upwards 45 pounds per square inch (or 3.2 kilograms per square centimetre)

1,000 tons gross tonnage and upwards, but under 4,000 tons gross tonnage 40 pounds per square inch (or 2.8 kilograms per square centimetre)

Under 1,000 tons gross tonnage To the satisfaction of the Administration

Cargo ships

6,000 tons gross tonnage and upwards 40 pounds per square inch (or 2.8 kilograms per square centimetre)

1,000 tons gross tonnage and upwards, but under 6,000 tons gross tonnage 37 pounds per square inch (or 2.6 kilograms per square centimetre)

Under 1,000 tons gross tonnage To the satisfaction of the Administration

(d) Number and Position of Hydrants

The number and position of the hydrants shall be such that at least two jets of water not emanating from the same hydrant, one of which shall be from a single length of hose, may reach any part of the ship normally accessible to the passengers or crew while the ship is being navigated.

(e) Pipes and Hydrants

(i) Materials readily rendered ineffective by heat shall not be used for fire mains unless adequately protected. The pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them. In ships where deck cargo may be carried, the positions of the hydrants shall be such that they are always readily accessible and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo. Unless there is provided one hose and nozzle for each hydrant in the ship there shall be complete interchangeability of hose couplings and nozzles.

(ii) Cocks or valves shall be fitted in such positions on the pipes that any of the fire hoses may be removed while the fire pumps are at work.

(f) Fire Hoses

Fire hoses shall be of material approved by the Administration and sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Their maximum length shall be to the satisfaction of the Administration. Each hose shall be provided with a nozzle and the necessary couplings. Hoses specified in these Regulations as "fire hoses" shall together with any necessary fittings and tools be kept ready for use in conspicuous positions near the water service hydrants or connections.
(g) **Nozzles**

(i) For the purposes of this Part, standard nozzle sizes shall be ½ inch (or 12 millimetres), 5/8 inch (or 16 millimetres) and 3/4 inch (or 20 millimetres), or as near thereto as possible. Larger diameter nozzles may be permitted subject to compliance with sub-paragraph (b) (ii) of this Regulation.

(ii) For accommodation and service spaces, a nozzle size greater than ½ inch (or 12 millimetres) need not be used.

(iii) For machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure mentioned in paragraph (c) of this Regulation from the smallest pump.

(h) **International Shore Connection**

The international shore connection required by paragraph (d) of Regulation 64 and paragraph (d) of Regulation 65 of this Chapter to be installed in the ship shall be in accordance with the following specification and the appended sketch: \(^1\)

- Outside diameter: 7 inches (or 178 millimetres).
- Inner diameter: 2 1/2 inches (or 64 millimetres).
- Bolt circle diameter: 5 1/4 inches (or 132 millimetres).
- Holes: 4 holes of 3/4 inch (or 19 millimetres) diameter equidistantly placed, slotted to the flange periphery.
- Flange thickness: 9/16 inch (or 14.5 millimetres) minimum.
- Bolts: 4, each of 5/8 inch (or 16 millimetres) diameter, 2 inches (or 50 millimetres) in length.
- Flange surface: flat face.
- Material: any suited to 150 pounds per square inch (or 10.5 kilogrammes per square centimetre) service.
- Gasket: any suited to 150 pounds per square inch (or 10.5 kilogrammes per square centimetre) service.

The connection shall be constructed of material suitable for 150 pounds per square inch (or 10.5 kilogrammes per square centimetre) service. The flange shall have a flat face on one side, and to the other shall have permanently attached thereto a coupling that will fit the ship’s hydrants and hose. The connection shall be kept aboard the ship together with a gasket of any material suitable for 150 pounds per square inch (or 10.5 kilogrammes per square centimetre) service, together with four 5/8 inch (or 16 millimetres) bolts, 2 inches (or 50 millimetres) in length and eight washers.

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\(^1\) See p. 192 of this volume.
International Shore Connection (Ship)
Regulation 57

FIRE EXTINGUISHERS (PORTABLE AND NON-PORTABLE)

(a) All fire extinguishers shall be of approved types and designs.

(i) The capacity of required portable fluid extinguishers shall be not more than 3 gallons (or 13½ litres) and not less than 2 gallons (or 9 litres). Other extinguishers shall not be in excess of the equivalent portability of the 3 gallon (or 13½ litres) fluid extinguisher and shall not be less than the fire extinguishing equivalent of a 2 gallon (or 9 litres) fluid extinguisher.

(ii) The Administration shall determine the equivalents of fire extinguishers.

(b) Spare charges shall be provided in accordance with requirements to be specified by the Administration.

(c) Fire extinguishers containing an extinguishing medium which either itself or when in use gives off gases harmful to persons shall not be permitted. For radio rooms and switchboards extinguishers containing not more than 1 quart (1.136 litres) of carbon tetrachloride or similar media may be permitted at the discretion of the Administration subject to such extinguishers being additional to any required by this Part of this Chapter.

(d) Fire extinguishers shall be periodically examined and subjected to such tests as the Administration may require.

(e) One of the portable fire extinguishers intended for use in any space shall be stowed near the entrance to that space.

Regulation 58

FIRE SMOOTHERING GAS OR STEAM FOR MACHINERY AND CARGO SPACES

(a) Where provision is made for the injection of gas or steam into machinery or cargo spaces for fire extinguishing purposes, the necessary pipes for conveying the gas or steam shall be provided with control valves or cocks which shall be so placed that they will be easily accessible and not readily cut off from use by an outbreak of fire. These control valves or cocks shall be so marked as to indicate clearly the compartments to which the pipes are led. Suitable provision shall be made to prevent inadvertent admission of the gas or steam to any compartment. Where cargo spaces fitted with smothering for fire protection are used as passenger spaces the smothering connection shall be blanked during service as a passenger space.

(b) The piping shall be arranged so as to provide effective distribution of fire smothering gas or steam. Where steam is used in large holds there shall be at least two pipes,
one of which shall be fitted in the forward part and one in the after part; the pipes shall be led well down in the space as remote as possible from the shell.

    (c) (i) When carbon dioxide is used as the extinguishing medium in cargo spaces, the quantity of gas available shall be sufficient to give a minimum volume of free gas equal to 30 per cent. of the gross volume of the largest cargo compartment in the ship which is capable of being sealed.

(ii) When carbon dioxide is used as an extinguishing medium for spaces containing boilers or internal combustion type machinery, the quantity of gas carried shall be sufficient to give a minimum quantity of free gas equal to the larger of the following quantities, either

1. 40 per cent. of the gross volume of the largest space, the volume to include the casing up to the level at which the horizontal area of the casing is 40 per cent. or less of that of the space concerned; or

2. 35 per cent. of the entire volume of the largest space including the casing;

provided that the above mentioned percentages may be reduced to 35 per cent. and 30 per cent. respectively for cargo ships of less than 2,000 tons gross tonnage; provided also that if two or more spaces containing boilers or internal combustion type machinery are not entirely separate they shall be considered as forming one compartment.

(iii) When carbon dioxide is used as an extinguishing medium both for cargo spaces and for spaces containing boilers or internal combustion type machinery the quantity of gas need not be more than the maximum required either for the largest cargo compartment or machinery space.

(iv) For the purpose of this paragraph the volume of gas shall be calculated at 9 cubic feet to the pound (or 0.56 cubic metres to the kilogramme).

(v) When carbon dioxide is used as the extinguishing medium for spaces containing boilers or internal combustion type machinery the fixed piping system shall be such that 85 per cent. of the gas can be discharged into the space within 2 minutes.

(d) Where a generator producing inert gas is used to provide smothering gas in a fixed fire smothering installation for cargo spaces, it shall be capable of producing hourly a volume of free gas at least equal to 25 per cent. of the gross volume of the largest compartment protected in this way for a period of 72 hours.

(e) When steam is used as the extinguishing medium in cargo spaces the boiler or boilers available for supplying steam shall have an evaporation of at least 1 pound of steam per hour for each 12 cubic feet (or 1 kilogramme for each 0.75 cubic metres) of the gross volume of the largest cargo compartment in the ship. Moreover the Administration shall be satisfied that steam will be available immediately and will not be dependent on the lighting of boilers and that it can be supplied continuously until the end of the voyage in the required quantity in addition to any steam necessary for the normal require-
ments of the ship including propulsion and that provision is made for extra feed water necessary to meet this requirement.

(f) Means shall be provided for giving audible warning of the release of fire smothering gas into any working space.

Regulation 59

Automatic Sprinkler Systems in Passenger Ships

(a) Any automatic water sprinkler system for fire protection required in accordance with Regulation 51 of this Chapter shall be ready for immediate use at any time, and no action on the part of the crew shall be necessary to set it in operation. Where such a system is fitted, it shall be kept charged at the necessary pressure and shall have provision for a continuous supply of water.

(b) The system shall be subdivided into a number of sections to be decided by the Administration, and automatic alarms shall be provided to indicate at one or more suitable points or stations the occurrence or indication of fire, and its location.

(c) The pump or pumps to provide the discharge from sprinkler heads shall be so connected as to be brought into action automatically by a pressure drop in the system. There shall be a connection from the ship's fire main provided with a lockable screw down valve and a non-return valve.

(d) Each pump shall be capable of maintaining a sufficient supply of water at the appropriate pressure, at the sprinkler heads, while such number of sprinkler heads as will be decided by the Administration are in operation.

(e) There shall be not less than two sources of power supply for the sea water pumps, air compressors and automatic alarms. Where the sources of power are electrical, these shall be a main generator and an emergency source of power. One supply shall be taken from the main switchboard, by separate feeders reserved solely for that purpose. Such feeders shall be run to a change-over switch situated near to the sprinkler unit and the switch shall normally be kept closed to the feeder from the emergency switchboard. The change-over switch shall be clearly labelled and no other switch shall be permitted in these feeders.

(f) Sprinkler heads shall be required to operate at temperatures that will be decided by the Administration. Suitable means for the periodic testing of all automatic arrangements shall be provided.

(g) Where Method II of fire protection is employed in a passenger ship the superstructure of which is constructed in aluminium alloy, the whole unit including the sprinkler pump, tank and air compressor shall be situated to the satisfaction of the Administration in a position reasonably remote from the boiler and machinery spaces. If the feeders
from the emergency generator to the sprinkler unit pass through any space constituting a fire risk the cables shall be of a fireproof type.

Regulation 60

Fixed Froth Fire Extinguishing System

(a) Any required fixed froth fire extinguishing system shall be able to discharge a quantity of froth sufficient to cover to a depth of 6 inches (or 15 centimetres) the largest area over which oil fuel is liable to spread.

(b) Such a system shall be controlled from an easily accessible position or positions, outside the space to be protected, which will not be readily cut off by an outbreak of fire.

Regulation 61

Fire Detection Systems

(a) All required fire detection systems shall be capable of automatically indicating the presence or indication of fire and also its location. Indicators shall be centralised either on the bridge or in other control stations which are provided with a direct communication with the bridge. The Administration may permit the indicators to be distributed among several stations.

(b) In passenger ships electrical equipment used in the operation of required fire detection systems shall have two separate sources of power, one of which shall be an emergency source.

(c) The alarm system shall operate both audible and visible signals at the main stations referred to in paragraph (a) of this Regulation. Detection systems for cargo spaces need not have audible alarms.

Regulation 62

Fixed Pressure Water-spraying Systems for Engine Rooms and Boiler Rooms

(a) Fixed pressure water-spraying systems for boiler rooms with oil fired boilers and engine rooms with internal combustion type machinery shall be provided with spraying nozzles of an approved type.

(b) The number and arrangement of the nozzles shall be to the satisfaction of the Administration and be such as to ensure an effective distribution of water in the spaces to be protected. Nozzles shall be fitted above bilges, tank tops and other areas over which oil fuel is liable to spread and also above other main fire hazards in the boiler and engine rooms.
(c) The system may be divided into sections, the distribution manifolds of which shall be operated from easily accessible positions outside the spaces to be protected and which will not be readily cut off by an outbreak of fire.

(d) The system shall be kept charged at the necessary pressure and the pump supplying the water for the system shall be put automatically into action by a pressure drop in the system.

(e) The pump shall be capable of simultaneously supplying at the necessary pressure all sections of the system in any one compartment to be protected. The pump and its controls shall be installed outside the space or spaces to be protected. It shall not be possible for a fire in the space or spaces protected by the water-spraying system to put the system out of action.

(f) Special precautions shall be taken to prevent the nozzles from becoming clogged by impurities in the water or corrosion of piping, nozzles, valves and pump.

*Regulation 63*

**Fireman's Outfit**

(a) A fireman's outfit shall consist of a breathing apparatus, a lifeline, a safety lamp and an axe, as described in this Regulation.

(b) A breathing apparatus shall be of an approved type and may be either:

(i) A smoke helmet or smoke mask which shall be provided with a suitable air pump and a length of air hose sufficient to reach from the open deck, well clear of hatch or doorway, to any part of the holds or machinery spaces. If, in order to comply with this sub-paragraph, an air hose exceeding 120 feet (or 36 metres) in length would be necessary, a self-contained breathing apparatus shall be substituted or provided in addition as determined by the Administration.

(ii) A self-contained breathing apparatus which shall be capable of functioning for a period of time to be determined by the Administration.

(c) Each breathing apparatus shall have attached to its belt or harness, by means of a snap hook, a fireproof lifeline of sufficient length and strength.

(d) A safety lamp (hand lantern) shall be of an approved type. Such safety lamps shall be electric, and shall have a minimum burning period of three hours.

(e) The axe shall be to the satisfaction of the Administration.

*Regulation 64*

**Requirements for Passenger Ships**

(a) *Patrols and Detection*

(i) An efficient patrol system shall be maintained in all passenger ships so that any outbreak of fire may be promptly detected. Manual fire alarms shall be fitted.
throughout the passenger and crew accommodation to enable the fire patrol to give an alarm immediately to the bridge or fire control station.

(ii) An approved fire alarm or fire detecting system shall be provided which will automatically indicate at one or more suitable points or stations, where it can be most quickly observed by officers and crew, the presence or indication of fire and its location in any part of the ship which, in the opinion of the Administration, is not accessible to the patrol system, except where it is shown to the satisfaction of the Administration that the ship is engaged on voyages of such short duration that it would be unreasonable to apply this requirement.

(b) **Fire Pumps and Water Service Pipes**

A passenger ship shall be provided with fire pumps, water service pipes, hydrants and hoses complying with Regulation 56 of this Chapter and with the following requirements:

(i) A passenger ship of 4,000 tons gross tonnage and upwards shall be provided with at least three independently driven fire pumps and every passenger ship of less than 4,000 tons gross tonnage with at least two such fire pumps.

(ii) In a passenger ship of 1,000 tons gross tonnage and upwards, the arrangement of sea connections, pumps and sources of power for operating them shall be such as to ensure that a fire in any one compartment will not put all the fire pumps out of action.

(iii) In a passenger ship of less than 1,000 tons gross tonnage the arrangements shall be to the satisfaction of the Administration.

(c) **Fire Hydrants, Hoses and Nozzles**

(i) A passenger ship shall be provided with such number of fire hoses as the Administration may deem sufficient. There shall be at least one fire hose for each of the hydrants required by paragraph (d) of Regulation 56 of this Chapter and these hoses shall be used only for the purposes of extinguishing fires or testing the fire extinguishing apparatus at fire drills and surveys.

(ii) In accommodation, service and machinery spaces, the number and position of hydrants shall be such that the requirements of paragraph (d) of Regulation 56 of this Chapter may be complied with when all watertight doors and all doors in main vertical zone bulkheads are closed.

(iii) In a passenger ship the arrangements shall be such that at least two jets of water can reach any part of any cargo space when empty.

(iv) All hydrants in the machinery spaces of passenger ships with oil-fired boilers or internal combustion type propelling machinery shall be fitted with hoses having in addition to the nozzles required in paragraph (f) of Regulation 56 of this Chapter nozzles suitable for spraying water on oil, or alternatively dual purpose nozzles.
(d) **International Shore Connection**

(i) A passenger ship of 1,000 tons gross tonnage and upwards shall be provided with at least one international shore connection, complying with Regulation 56 of this Chapter.

(ii) Facilities shall be available enabling such a connection to be used on either side of the ship.

(e) **Portable Fire Extinguishers in Accommodation and Service Spaces**

A passenger ship shall be provided in accommodation and service spaces with such approved portable fire extinguishers as the Administration may deem to be appropriate and sufficient.

(f) **Fixed Fire Smothering Arrangements in Cargo Spaces**

(i) The cargo spaces of passenger ships of 1,000 tons gross tonnage and upwards shall be protected by a fixed fire smothering gas system complying with Regulation 58 of this Chapter.

(ii) Where it is shown to the satisfaction of the Administration that a passenger ship is engaged on voyages of such short duration that it would be unreasonable to apply the requirements of sub-paragraph (i) of this paragraph and also in passenger ships of less than 1,000 tons gross tonnage, the arrangements in cargo spaces shall be to the satisfaction of the Administration.

(g) **Fire Extinguishing Appliances in Boiler Rooms, &c.**

Where main or auxiliary oil-fired boilers are situated, or in spaces containing oil fuel units or settling tanks, a passenger ship shall be provided with the following arrangements.

(i) There shall be any one of the following fixed fire extinguishing installations:

1. A pressure water spraying system complying with Regulation 62 of this Chapter;
2. A fire smothering gas installation complying with Regulation 58 of this Chapter;
3. A fixed froth installation complying with Regulation 60 of this Chapter. (The Administration may require fixed or mobile arrangements by pressure water or froth spraying to fight fire above the floor plates.)

In each case if the engine and boiler rooms are not entirely separate, or if fuel oil can drain from the boiler room into the engine room bilges, the combined engine and boiler rooms shall be considered as one compartment.

(ii) There shall be at least two approved portable extinguishers discharging froth or other approved medium suitable for extinguishing oil fires, in each firing space in each boiler room and each space in which a part of the oil fuel installation is situated. There shall be not less than one approved froth type extinguisher of at least 30 gallons (or
136 litres) capacity or equivalent in each boiler room. These extinguishers shall be provided with hoses on reels suitable for reaching any part of the boiler room and spaces containing any part of the oil fuel installations.

(iii) In each firing space there shall be a receptacle containing sand, sawdust impregnated with soda or other approved dry material, in such quantity as may be required by the Administration. Alternatively an approved portable extinguisher may be substituted therefor.

(h) Fire Fighting Appliances in Spaces containing Internal Combustion Type Machinery

Where internal combustion type engines are used, either (1) for main propulsion or (2) for auxiliary purposes associated with a total power not less than 1,000 b.h.p., a passenger ship shall be provided with the following arrangements:

(i) There shall be one of the fixed arrangements required by sub-paragraph (g) (i) of this Regulation.

(ii) There shall be in each engine space one approved froth type extinguisher of not less than 10 gallons (or 45 litres) capacity or equivalent and also one approved portable froth type extinguisher for each 1,000 b.h.p. of the engines or part thereof; but the total number of portable extinguishers so supplied shall be not less than two and need not exceed six.

(i) Fire Fighting Arrangements in Spaces containing Steam Turbines and not requiring any Fixed Installation

The Administration shall give special consideration to the fire-extinguishing arrangements to be provided in spaces containing steam turbines which are separated from boiler rooms by watertight bulkheads.

(j) Fireman’s Outfits

A passenger ship shall carry at least two fireman’s outfits each complying with the requirements of Regulation 63 of this Chapter. Where the ship exceeds 10,000 tons gross tonnage at least three outfits shall be carried and where it exceeds 20,000 tons gross tonnage at least four outfits shall be carried. These outfits shall be kept in widely separated places ready for use.

Regulation 65
Requirements for Cargo Ships

(a) Application

Where by virtue of minimum gross tonnage limits smaller cargo ships to which the present Regulations apply are not covered by specific requirements the arrangements for fire detection and extinction shall be to the satisfaction of the Administration.
(b) Fire Pumps and Water Service Pipes

A cargo ship shall be provided with fire pumps, water service pipes, hydrants and hoses complying with Regulation 56 of this Chapter and with the following requirements:

(i) A cargo ship of 1,000 tons gross tonnage and upwards shall be provided with two independently driven power pumps.

(ii) In a cargo ship of 1,000 tons gross tonnage and upwards if a fire in any one compartment could put all the pumps out of action, there must be an alternative means of providing water for fire fighting. In a cargo ship of 2,000 tons gross tonnage and upwards this alternative means shall be a fixed emergency pump independently driven. This emergency pump shall be capable of supplying two jets of water to the satisfaction of the Administration.

(c) Fire Hydrants, Hoses and Nozzles

(i) In cargo ships of 1,000 tons gross tonnage and upwards the number of fire hoses to be provided, each complete with couplings and nozzles, shall be one for each 100 feet length of the ship and one spare, but in no case less than five in all. This number does not include any hoses required in any engine or boiler room. The Administration may increase the number of the hoses required so as to ensure that hoses in sufficient number are available and accessible at all times, having regard to the type of the ship and the nature of the trade on which the ship is employed.

(ii) In accommodation, service and machinery spaces, the number and position of hydrants shall be such as to comply with the requirements of paragraph (d) of Regulation 56 of this Chapter.

(iii) In a cargo ship the arrangements shall be such that at least two jets of water can reach any part of any cargo space when empty.

(iv) All hydrants in the machinery spaces of cargo ships with oil fired boilers or internal combustion type propelling machinery shall be fitted with hoses having in addition to the nozzles required in paragraph (f) of Regulation 56 of this Chapter nozzles suitable for spraying water on oil, or alternatively dual purpose nozzles.

(d) International Shore Connection

(i) A cargo ship of 1,000 tons gross tonnage and upwards shall be provided with at least one international shore connection, complying with Regulation 56 of this Chapter.

(ii) Facilities shall be available enabling such a connection to be used on either side of the ship.

(e) Portable Fire Extinguishers in Accommodation and Service Spaces

A cargo ship shall be provided in accommodation and service spaces with such approved portable fire extinguishers as the Administration may deem to be appropriate.
and sufficient; in any case, their number shall not be less than five for ships of 1,000 tons gross tonnage and upwards.

(i) **Fixed Fire Smothering Arrangements in Cargo Spaces**

(i) Cargo spaces of ships of 2,000 tons gross tonnage and upwards shall be protected by a fixed fire smothering system complying with Regulation 58 of this Chapter. The Administration may allow the use of steam in lieu of smothering gas if the arrangements comply with paragraph (e) of Regulation 58 of this Chapter.

(ii) In tankers, installations discharging froth internally or externally to the tanks may be accepted as a suitable alternative to smothering gas or steam. The details of such installations shall be to the satisfaction of the Administration.

(iii) The Administration may exempt from the requirements of sub-paragraphs (i) and (ii) of this paragraph the cargo holds of any ship (other than the tanks of a tanker) —

(1) if they are provided with steel hatch covers and effective means of closing all ventilators and other openings leading to the holds;

(2) if the ship is constructed and intended solely for carrying such cargoes as ore, coal or grain;

(3) where it is shown to the satisfaction of the Administration that the ship is engaged on voyages of such short duration that it would be unreasonable to apply the requirement.

(iv) Every cargo ship in addition to complying with the requirements of this Regulation shall, while carrying explosives of such nature or in such quantity as are not permitted to be carried in passenger ships under Regulation 8 of Chapter VII of these Regulations comply with the following requirements:

(1) Steam shall not be used for fire smothering purposes in any compartment containing explosives. For the purposes of this sub-paragraph, "compartment" means all spaces contained between two adjacent permanent bulkheads and includes the lower hold and all cargo spaces above it. The whole of any shelter deck space not subdivided by steel bulkheads the openings of which can be closed by steel closing plates shall, for the purposes of this sub-paragraph, be considered as a compartment. Where steel bulkheads with openings closed by steel closing plates are fitted, the enclosed spaces in the shelter deck may be considered as part of the compartment or compartments below.

(2) In addition, in each compartment containing explosives and in adjacent cargo compartments, there shall be provided a smoke or fire detection system in each cargo space.
(g) Fire Extinguishing Appliances in Boiler Rooms, &c.

Where main or auxiliary oil fired boilers are situated, or in spaces containing oil fuel units or settling tanks, a cargo ship of 1,000 tons gross tonnage and upwards shall be provided with the following arrangements:

(i) There shall be any one of the following fixed fire extinguishing installations:

1. A pressure water spraying system complying with Regulation 62 of this Chapter;

2. A fire smothering gas installation complying with Regulation 58 of this Chapter;

3. A fixed froth installation complying with Regulation 60 of this Chapter. (The Administration may require fixed or mobile arrangements by pressure water or froth spraying to fight fire above the floor plates.)

(ii) In each case if the engine and boiler rooms are not entirely separate, or if fuel oil can drain from the boiler room into the engine room bilges, the combined engine and boiler rooms shall be considered as one compartment.

(iii) There shall be at least two approved portable extinguishers discharging froth or other approved medium suitable for extinguishing oil fires in each firing space in each boiler room and each space in which a part of the oil fuel installation is situated. In addition, there shall be at least one extinguisher of the same description with a capacity of 2 gallons (or 9 litres) for each burner, provided that the total capacity of the additional extinguisher or extinguishers need not exceed 10 gallons (or 45 litres) for any one boiler room.

(h) Fire Fighting Appliances in Spaces containing Internal Combustion Type Machinery

Where internal combustion type engines are used, either (1) for main propulsion machinery, or (2) for auxiliary purposes associated with a total power not less than 1,000 b.h.p., a cargo ship of 1,000 tons gross tonnage and upwards shall be provided with the following arrangements:

(i) There shall be one of the fixed arrangements required by sub-paragraph (g) (i) of this Regulation.

(ii) There shall be in each engine space one approved froth type extinguisher of not less than 10 gallons (or 45 litres) capacity or equivalent and also one approved portable froth extinguisher for each 1,000 b.h.p. of the engines or part thereof; but the total number of portable extinguishers so supplied shall be not less than two and need not exceed six.

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(i) **Fire Fighting Arrangements in Spaces containing Steam Turbines and not requiring any Fixed Installation**

The Administration shall give special consideration to the fire extinguishing arrangements to be provided in spaces containing steam turbines which are separated from boiler rooms by watertight bulkheads.

(j) **Firemen's Outfit**

A cargo ship shall carry at least one fireman's outfit complying with the requirements of Regulation 63 of this Chapter.

**Regulation 66**

**READY AVAILABILITY OF FIRE FIGHTING APPLIANCES**

Fire extinguishing appliances in new and existing passenger ships and cargo ships shall be kept in good order and available for immediate use at all times during the voyage.

**Regulation 67**

**ACCEPTANCE OF SUBSTITUTES**

Where in this Part of this Chapter any special type of appliance, apparatus, extinguishing medium or arrangement is specified, any other type of appliance, &c. may be allowed, provided the Administration is satisfied that it is not less effective.

**Part F**

**GENERAL FIRE PRECAUTIONS**

(Part F applies to passenger ships and cargo ships.)

**Regulation 68**

**MEANS OF ESCAPE**

(a) **Passenger Ships**

(i) In and from all passenger and crew spaces and spaces in which crew are normally employed, other than machinery spaces, stairways and ladderways shall be arranged so as to provide ready means of escape to the lifeboat embarkation deck. In particular the following precautions shall be complied with:

(1) below the bulkhead deck, two means of escape, at least one of which shall be independent of watertight doors, shall be provided for each watertight compartment or similarly restricted space or group of spaces. One of these means of escape may be dispensed with by the Administration, due regard being paid to the nature and the location of spaces concerned, and to the number of persons who normally might be quartered or employed there;
(2) above the bulkhead deck, there shall be at least two practical means of escape from each main vertical zone or similarly restricted space or group of spaces at least one of which shall give access to a stairway forming a vertical escape;

(3) at least one of the means of escape shall be by means of a readily accessible enclosed stairway, which shall provide as far as practicable continuous fire shelter from the level of its origin to the lifeboat embarkation deck. The width, number and continuity of the stairways shall be to the satisfaction of the Administration.

(ii) In machinery spaces, two means of escape, one of which may be a watertight door, shall be provided from each engine room, shaft tunnel and boiler room. In machinery spaces, where no watertight door is available, the two means of escape shall be formed by two sets of steel ladders as widely separated as possible leading to doors in the casing similarly separated and from which access is provided to the embarkation deck. In the case of ships of less than 2,000 tons gross tonnage, the Administration may dispense with this requirement, due regard being paid to the width and the disposition of the casing.

(b) Cargo Ships

(i) In and from all crew and passenger spaces and spaces in which crew are normally employed, other than machinery spaces, stairways and ladders shall be arranged so as to provide ready means of escape to the lifeboat embarkation deck.

(ii) In machinery spaces, the requirements of sub-paragraph (a) (ii) of this Regulation shall apply.

Regulation 69

Means for Stopping Machinery and for Shutting Off Oil Fuel Suction Pipes

(a) Means shall be provided for stopping ventilating fans serving machinery and cargo spaces and for closing all doorways, ventilators, annular spaces around funnels and other openings to such spaces. These means shall be capable of being operated from outside such spaces in case of fire.

(b) Machinery driving forced and induced draught fans, oil fuel transfer pumps, oil fuel unit pumps and other similar fuel pumps shall be fitted with remote controls situated outside the space concerned so that they may be stopped in the event of a fire arising in the space in which they are located.

(c) Every oil fuel suction pipe from a storage, settling or daily service tank situated above the double bottom shall be fitted with a cock or valve capable of being closed from outside the space concerned in the event of a fire arising in the space in which such
tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel, valves on the tanks shall be fitted but control in event of fire may be effected by means of an additional valve on the pipe line or lines outside the tunnel or tunnels.

Regulation 70
FIRE CONTROL PLANS

In any passenger ship, and, as far as applicable in any cargo ship, there shall be permanently exhibited for the guidance of the ship's officers general arrangement plans showing clearly for each deck the control stations, the various fire sections enclosed by fire-resisting bulkheads, the sections enclosed by fire-retarding bulkheads (if any), together with particulars of the fire alarms, detecting systems, the sprinkler installation (if any), the fire extinguishing appliances, means of access to different compartments, decks, &c., and the ventilating system including particulars of the master fan controls, the positions of dampers and identification numbers of the ventilating fans serving each section. Alternatively, at the discretion of the Administration, the aforementioned details may be set out in a booklet, a copy of which shall be supplied to each officer, and one copy at all times shall be available on board in an accessible position. Plans and booklets shall be kept up-to-date, any alterations being recorded thereon as soon as practicable.

CHAPTER III
LIFE-SAVING APPLIANCES, &c.

Regulation 1
APPLICATION

(a) This Chapter, except where it is otherwise expressly provided, applies as follows to new ships engaged on international voyages:

Part A—Passenger ships and cargo ships.
Part B—Passenger ships.
Part C—Cargo ships.

(b) In the case of existing ships engaged on international voyages and which do not already comply with the provisions of this Chapter relating to new ships, the arrangements in each ship shall be considered by the Administration with a view to securing, so far as this is practicable and reasonable, and as early as possible, substantial compliance with the requirements of this Chapter. The proviso to sub-paragraph (b) (i) of Regulation 27 of this Chapter may, however, be applied to existing ships only if:

(i) the provisions of Regulations 4, 8, 14, 18 and 19, and paragraphs (a) and (b) of Regulation 27 of this Chapter are complied with;
(ii) the liferafts carried in accordance with the provisions of paragraph (b) of Regulation 27 comply with the requirements of either Regulation 15 or Regulation 16, and of Regulation 17 of this Chapter; and

(iii) the total number of persons on board shall not be increased as the result of the provision of liferafts.

Part A

GENERAL

(Part A applies to both passenger ships and cargo ships.)

Regulation 2

DEFINITIONS

(a) For the purposes of this Chapter the expression “short international voyage” means an international voyage in the course of which a ship is not more than 200 miles from a port or place in which the passengers and crew could be placed in safety, and which does not exceed 600 miles in length between the last port of call in the country in which the voyage begins and the final port of destination.

(b) For the purposes of this Chapter, the expression “liferaft” means a liferaft complying with either Regulation 15 or Regulation 16 of this Chapter.

(c) For the purposes of this Chapter, the expression “approved launching device” means a device approved by the Administration, capable of launching from the embarkation position a liferaft fully loaded with the number of persons it is permitted to carry and with its equipment.

(d) For the purposes of this Chapter, the expression “certificated lifeboatman” means any member of the crew who holds a certificate of efficiency issued under the provisions of Regulation 32 of this Chapter.

(e) For the purposes of this Chapter, the expression “buoyant apparatus” means flotation equipment (other than lifeboats, liferafts, lifebuoys and lifejackets) designed to support a specified number of persons who are in the water and of such construction that it retains its shape and properties.

Regulation 3

EXEMPTIONS

(a) The Administration, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of the full requirements of this Chapter unreasonable or unnecessary, may to that extent exempt from the requirements of this Chapter individual ships or classes of ships which, in the course of their voyage, do not go more than 20 miles from the nearest land.

(b) In the case of passenger ships engaged on international voyages which are employed in the carriage of large numbers of unberthed passengers in special trades,
such, for example, as the pilgrim trade, the Administration, if satisfied that it is imprac-
ticable to enforce compliance with the requirements of this Chapter, may exempt such
ships from those requirements on the following conditions:

(i) that the fullest provision which the circumstances of the trade will permit shall be
made in the matter of lifeboats and other life-saving appliances and fire protection;

(ii) that all such boats and appliances shall be readily available within the meaning of
Regulation 4 of this Chapter;

(iii) that a lifejacket shall be provided for every person on board;

(iv) that steps shall be taken to formulate general rules which shall be applicable to the
particular circumstances of these trades. Such rules shall be formulated in concert
with such other Contracting Governments, if any, as may be directly interested in
the carriage of such passengers in such trades.

Notwithstanding any provisions of the present Convention the Simla Rules, 1931,\(^1\)
shall continue in force as between the Parties to those Rules until the rules formulated
under sub-paragraph (b) (iv) of this Regulation come into force.

Regulation 4

Ready Availability of Lifeboats, Liferafts and Buoyant Apparatus

(a) The general principle governing the provision of lifeboats, liferafts and buoyant
apparatus in a ship to which this Chapter applies is that they shall be readily available
in case of emergency.

(b) To be readily available, the lifeboats, liferafts and buoyant apparatus shall comply
with the following conditions:

(i) they shall be capable of being put into the water safely and rapidly even under
unfavourable conditions of trim and of 15 degrees of list;

(ii) it shall be possible to effect embarkation into the lifeboats and liferafts rapidly and
in good order;

(iii) the arrangement of each lifeboat, liferaft and article of buoyant apparatus shall
be such that it will not interfere with the operation of other boats, liferafts and
buoyant apparatus.

(c) All the life-saving appliances shall be kept in working order and available for
immediate use before the ship leaves port and at all times during the voyage.

Regulation 5

Construction of Lifeboats

(a) All lifeboats shall be properly constructed and shall be of such form and propor-
tions that they shall have ample stability in a seaway, and sufficient freeboard when

\(^1\) See footnote 1, p. 82 of this volume.
loaded with their full complement of persons and equipment. All lifeboats shall be capable of maintaining positive stability when open to the sea and loaded with their full complement of persons and equipment.

(b) (i) All lifeboats shall have rigid sides and internal buoyancy only. The Administration may approve lifeboats with a rigid shelter, provided that it may be readily opened from both inside and outside, and does not impede rapid embarkation and disembarkation or the launching and handling of the lifeboat.

(ii) Motor lifeboats may be fitted to the satisfaction of the Administration with means for preventing the entry of water at the fore end.

(iii) All lifeboats shall be not less than 24 feet (or 7.3 metres) in length except where owing to the size of the ship, or for other reasons, the Administration considers the carriage of such lifeboats unreasonable or impracticable. In no ship shall the lifeboats be less than 16 feet (or 4.9 metres) in length.

(c) No lifeboat may be approved the weight of which when fully laden with persons and equipment exceeds 20 tons (or 20,300 kilogrammes) or which has a carrying capacity calculated in accordance with Regulation 7 of this Chapter of more than 150 persons.

(d) All lifeboats permitted to carry more than 60 persons but not more than 100 persons shall be either motor lifeboats complying with the requirements of Regulation 9 of this Chapter or be lifeboats fitted with an approved means of mechanical propulsion complying with Regulation 10 of this Chapter. All lifeboats permitted to carry more than 100 persons shall be motor lifeboats complying with the requirements of Regulation 9 of this Chapter.

(e) All lifeboats shall be of sufficient strength to enable them to be safely lowered into the water when loaded with their full complement of persons and equipment. All lifeboats shall be of such strength that they will not suffer residual deflection if subjected to an overload of 25 per cent.

(f) All lifeboats shall have a mean sheer at least equal to 4 per cent. of their length. The sheer shall be approximately parabolic in form.

(g) In lifeboats permitted to carry 100 or more persons the volume of the buoyancy shall be increased to the satisfaction of the Administration.

(h) All lifeboats shall have inherent buoyancy, or shall be fitted with watertight air cases or other equivalent non-corrodible buoyant material which shall not be adversely affected by oil or oil products, sufficient to float the boat and its equipment when the boat is flooded and open to the sea. An additional volume of watertight air cases or other equivalent non-corrodible buoyant material, which shall not be adversely affected by oil
or oil products, equal to at least one-tenth of the cubic capacity of the boat shall also be provided. The Administration may permit thewatertight air cases to be filled with a non-corrodible buoyant material which shall not be adversely affected by oil or oil products.

(i) All thwarts and side-seats shall be fitted as low in the lifeboat as practicable.

(j) The block coefficient of the cubic capacity as determined in accordance with Regulation 6 of this Chapter of all lifeboats, except wooden lifeboats made of planks, shall be not less than 0·64.

Regulation 6

Cubic Capacity of Lifeboats

(a) The cubic capacity of a lifeboat shall be determined by Stirling's (Simpson's) Rule or by any other method giving the same degree of accuracy. The capacity of a square-sterned lifeboat shall be calculated as if the lifeboat had a pointed stern.

(b) For example, the capacity in cubic feet (or cubic metres) of a lifeboat, calculated by the aid of Stirling's Rule, may be considered as given by the following formula:

\[
\text{Capacity} = \frac{L}{12} (4A + 2B + 4C)
\]

L being the length of the lifeboat in feet (or metres) from the inside of the planking or plating at the stem to the corresponding point at the stern post; in the case of a lifeboat with a square stern, the length is measured to the inside of the transom.

A, B, C denote respectively the areas of the cross-sections at the quarter-length forward, amidships, and the quarter-length aft, which correspond to the three points obtained by dividing L into four equal parts. (The areas corresponding to the two ends of the lifeboat are considered negligible.)

The areas A, B, C shall be deemed to be given in square feet (or square metres) by the successive application of the following formula to each of the three cross-sections:

\[
\text{Area} = \frac{h}{12} (a + 4b + 2c + 4d + e)
\]

h being the depth measured in feet (or in metres) inside the planking or plating from the keel to the level of the gunwale, or, in certain cases, to a lower level as determined hereafter.

a, b, c, d, e denote the horizontal breadths of the lifeboat measured in feet (or in metres) at the upper and lower points of the depth and at the three points obtained by dividing h into four equal parts (a and e being the breadths at the extreme point, and c at the middle point of h).
(c) If the sheer of the gunwale, measured at the two points situated at a quarter of the length of the lifeboat from the ends, exceeds 1 per cent. of the length of the lifeboat the depth employed in calculating the area of the cross-sections A or C shall be deemed to be the depth amidships plus 1 per cent. of the length of the lifeboat.

(d) If the depth of the lifeboat amidships exceeds 45 per cent. of the breadth, the depth employed in calculating the area of the amidship cross-section B shall be deemed to be equal to 45 per cent. of the breadth, and the depth employed in calculating the areas of the quarter-length sections A and C is obtained by increasing this last figure by an amount equal to 1 per cent. of the length of the lifeboat, provided that in no case shall the depths employed in the calculation exceed the actual depths at these points.

(e) If the depth of the lifeboat is greater than 4 feet (or 122 centimetres) the number of persons given by the application of this Rule shall be reduced in proportion to the ratio of 4 feet (or 122 centimetres) to the actual depth, until the lifeboat has been satisfactorily tested afloat with that number of persons on board, all wearing lifejackets.

(f) The Administration shall impose, by suitable formulae, a limit for the number of persons allowed in lifeboats with very fine ends and in lifeboats very full in form.

(g) The Administration may assign to a lifeboat constructed of wooden planks capacity equal to the product of the length, the breadth and the depth multiplied by 0.6 if it is evident that this formula does not give a greater capacity than that obtained by the above method. The dimensions shall then be measured in the following manner:

Length.—From the intersection of the outside of the planking with the stem to the corresponding point at the stern post or, in the case of a square-sterned boat, to the after side of the transom.

Breadth.—From the outside of the planking at the point where the breadth of the boat is greatest.

Depth.—Amidships inside the planking from the keel to the level of the gunwale, but the depth used in calculating the cubic capacity may not in any case exceed 45 per cent. of the breadth.

In all cases the shipowner has the right to require that the cubic capacity of the lifeboat shall be determined by exact measurement.

(h) The cubic capacity of a motor lifeboat or a lifeboat fitted with other propelling gear shall be obtained from the gross capacity by deducting a volume equal to that occupied by the motor and its accessories or the gearbox of the other propelling gear, and, when carried, the radiotelegraph installation and searchlight with their accessories.
Regulation 7

CARRYING CAPACITY OF LIFEBOATS

The number of persons which a lifeboat shall be permitted to accommodate shall be equal to the greatest whole number obtained by dividing the capacity in cubic feet by:

In the case of a lifeboat of 24 feet (or 7.3 metres) in length or over ........ 10 (or where the capacity is measured in cubic metres, 0.283);

in the case of lifeboats of 16 feet (or 4.9 metres) in length ............. 14 (or where the capacity is measured in cubic metres, 0.396); and

in the case of lifeboats of 16 feet (or 4.9 metres) in length or over but under 24 feet (or 4.9 metres) ........... a number between 14 and 10 (or where the capacity is measured in cubic metres, between 0.396 and 0.283), to be obtained by interpolation;

provided that the number shall in no case exceed the number of adult persons wearing life jackets which can be seated without in any way interfering with the use of oars or the operation of other propulsion equipment.

Regulation 8

NUMBER OF MOTOR LIFEBOATS TO BE CARRIED

(a) In every passenger ship there shall be carried on each side of the ship at least one motor lifeboat complying with the requirements of Regulation 9 of this Chapter.

Provided that in passenger ships in which the total number of persons which the ship is certified to carry, together with the crew, does not exceed 30, only one such motor lifeboat shall be required.

(b) In every cargo ship of 1,600 tons gross tonnage and upwards, except tankers, ships employed as whale factory ships, ships employed as fish processing or canning factory ships, and ships engaged in the carriage of persons in the whaling, fish processing or canning industries, there shall be carried at least one motor lifeboat complying with the requirements of Regulation 9 of this Chapter.

(c) In every tanker of 1,600 tons gross tonnage and upwards, in every ship employed as a whale factory ship, in every ship employed as a fish processing or canning factory ship and in every ship engaged in the carriage of persons employed in the whaling, fish
processing or canning industries, there shall be carried on each side at least one motor
lifeboat complying with the requirements of Regulation 9 of this Chapter.

Regulation 9
SPECIFICATION OF MOTOR LIFEBOATS

(a) A motor lifeboat shall comply with the following conditions:

(i) It shall be fitted with a compression ignition engine and kept so as to be at all
times ready for use; it shall be capable of being readily started in all conditions; sufficient
fuel for 24 hours continuous operation at the speed specified in sub-paragraph (a) (iii)
of this Regulation shall be provided.

(ii) The engine and its accessories shall be suitably enclosed to ensure operation under
adverse weather conditions, and the engine casing shall be fire-resisting. Provision shall
be made for going astern.

(iii) The speed ahead in smooth water when loaded with its full complement of
persons and equipment shall be:

(1) In the case of motor lifeboats required by Regulation 8 of this Chapter to be carried
in passenger ships, tankers, ships employed as whale factory ships, ships employed as
fish processing or canning factory ships and ships engaged in the carriage of persons
employed in the whaling, fish processing or canning industries, at least six knots.

(2) In the case of any other motor lifeboat, at least four knots.

(b) The volume of the internal buoyancy appliances of a motor lifeboat shall be
increased above that required by Regulation 5 of this Chapter by the amount, if any,
by which the volume of the internal buoyancy appliances required to support the engine
and its accessories, and, if fitted, the searchlight and radiotelegraph installation and their
accessories, exceeds the volume of the internal buoyancy appliances required, at the
rate of one cubic foot per person, to support the additional persons which the lifeboat
could accommodate if the motor and its accessories, and, if fitted, the searchlight and
radiotelegraph installation and their accessories, were removed.

Regulation 10
SPECIFICATION OF MECHANICALLY PROPELLED LIFEBOATS OTHER THAN MOTOR LIFEBOATS

A mechanically propelled lifeboat, other than a motor lifeboat, shall comply with the
following conditions:

(a) The propelling gear shall be of an approved type and shall have sufficient power
to enable the lifeboat to be readily cleared from the ship's side when launched and to be
able to hold course under adverse weather conditions. If the gear is manually operated it shall be capable of being worked by persons untrained in its use and shall be capable of being operated when the lifeboat is flooded.

(b) A device shall be fitted by means of which the helmsman can cause the lifeboat to go astern at any time when the propelling gear is in operation.

(c) The volume of the internal buoyancy of a mechanically propelled lifeboat, other than a motor lifeboat, shall be increased to compensate for the weight of the propelling gear.

Regulation 11

Equipment of Lifeboats

(a) The normal equipment of every lifeboat shall consist of:

(i) a single banked complement of buoyant oars, two spare buoyant oars, and a buoyant steering oar; one set and a half of thole pins or crutches, attached to the lifeboat by lanyard or chain; a boat hook;

(ii) two plugs for each plug hole (plugs are not required when proper automatic valves are fitted) attached to the lifeboat by lanyards or chains; a bale, and two buckets of approved material;

(iii) a rudder attached to the lifeboat and a tiller;

(iv) two hatchets, one at each end of the lifeboat;

(v) a lamp, with oil sufficient for 12 hours; two boxes of suitable matches in a watertight container;

(vi) a mast or masts, with galvanised wire stays together with sails (coloured orange);

(vii) an efficient compass in binnacle, to be luminised or fitted with suitable means of illumination;

(viii) a lifeline becketed round the outside of the lifeboat;

(ix) a sea-anchor of approved size;

(x) two painters of sufficient length. One shall be secured to the forward end of the lifeboat with strop and toggle so that it can be released, and the other shall be firmly secured to the stem of the lifeboat and be ready for use;

(xi) a vessel containing one gallon (or four and half litres) of vegetable, fish or animal oil. The vessel shall be so constructed that the oil can be easily distributed on the water, and so arranged that it can be attached to the sea-anchor;

(xii) a food ration, determined by the Administration, for each person the lifeboat is certified to carry. These rations shall be kept in airtight receptacles which are to be stowed in a watertight container;
(xiii) watertight receptacles containing six pints (or three litres) of fresh water for each person the lifeboat is certified to carry, or watertight receptacles containing four pints (or two litres) of fresh water for each person together with an approved de-salting apparatus capable of providing two pints (or one litre) of drinking water per person; a rustproof dipper with lanyard; a rustproof graduated drinking vessel;

(xiv) four parachute signals of approved type capable of giving a bright red light at a high altitude; six hand flares of an approved type giving a bright red light;

(xv) two buoyant smoke signals of an approved type (for day-time use) capable of giving off a volume of orange-coloured smoke;

(xvi) approved means to enable persons to cling to the boat should it be upturned, in the form of bilge keels or keel rails, together with grab lines secured from gunwale to gunwale under the keel, or other approved arrangements;

(xvii) an approved first aid outfit in a watertight case;

(xviii) a waterproof electric torch suitable for signalling in the Morse Code together with one spare set of batteries and one spare bulb in a waterproof container;

(xix) a daylight-signalling mirror of an approved type;

(xx) a jack-knife fitted with a tin opener to be kept attached to the boat with a lanyard;

(xx) two light buoyant heaving lines;

(xxii) a manual pump of an approved type;

(xxiii) a suitable locker for stowage of small items of equipment;

(xxiv) one whistle or equivalent sound signal;

(xxv) one set of fishing tackle;

(xxvi) one approved cover of a highly visible colour capable of protecting the occupants against injury by exposure; and

(xxvii) one copy of the illustrated table of life-saving signals referred to in Regulation 16 of Chapter V.

(b) In the case of ships engaged on voyages of such duration that in the opinion of the Administration the items specified in sub-paragraphs (vi), (xii), (xix), (xx) and (xxv) of paragraph (a) of this Regulation are unnecessary, the Administration may allow them to be dispensed with.

(c) Notwithstanding the provisions of paragraph (a) of this Regulation, motor lifeboats or other approved mechanically propelled lifeboats need not carry a mast or sails or more than half the complement of oars, but they shall carry two boat hooks.

(d) All lifeboats shall be fitted with suitable means to enable persons in the water to climb into the lifeboat.
(e) Every motor lifeboat shall carry portable fire-extinguishing equipment of an approved type capable of discharging froth or other suitable substance for extinguishing oil fires.

**Regulation 12**

**SECURITY OF LIFEBOAT EQUIPMENT**

All items of lifeboat equipment, with the exception of the boat hook which shall be kept free for fending off purposes, shall be suitably secured within the lifeboat. The lashing shall be carried out in such a manner as to ensure the security of the equipment and so as not to interfere with the lifting hooks or to prevent ready embarkation. All items of lifeboat equipment shall be as small and light in weight as possible and shall be packed in suitable and compact form.

**Regulation 13**

**PORTABLE RADIO APPARATUS**

(a) An approved portable radio apparatus for survival craft complying with the requirements set out in Regulation 13 of Chapter IV shall be carried in all ships except those on which there is carried on each side of the ship a motor lifeboat fitted with a radiotelegraph installation complying with the provisions of Regulation 14 of this Chapter and of Regulation 12 of Chapter IV. All this equipment shall be kept together in the chartroom or other suitable place ready to be moved to one or other of the lifeboats in the event of an emergency. However, in tankers of 3,000 tons gross tonnage and upwards in which lifeboats are fitted amidships and aft this equipment shall be kept in a suitable place in the vicinity of those lifeboats which are furthest away from the ship's main transmitter.

(b) In the case of ships engaged on voyages of such duration that in the opinion of the Administration portable radio apparatus for survival craft is unnecessary, the Administration may allow such equipment to be dispensed with.

**Regulation 14**

**RADIO APPARATUS AND SEARCHLIGHTS IN MOTOR LIFEBOATS**

(a) (i) Where the total number of persons on board a passenger ship engaged on international voyages which are not short international voyages, a ship employed as a whale factory ship, a ship employed as a fish processing or canning factory ship or a ship engaged in the carriage of persons employed in the whaling, fish processing or canning industries, is more than 199 but less than 1,500, a radiotelegraph apparatus complying with the requirements set out in this Regulation and in Regulation 12 of Chapter IV shall be fitted in at least one of the motor lifeboats required under Regulation 8 of this Chapter to be carried in that ship.
(ii) Where the total number of persons on board such a ship is 1,500 or more, such a radiotelegraph apparatus shall be fitted in every motor lifeboat required under Regulation 8 of this Chapter to be carried in that ship.

(b) The radio apparatus shall be installed in a cabin large enough to accommodate both the equipment and the person using it.

(c) The arrangements shall be such that the efficient operation of the transmitter and receiver shall not be interfered with by the engine while it is running, whether a battery is on charge or not.

(d) The radio battery shall not be used to supply power to any engine starting motor or ignition system.

(e) The motor lifeboat engine shall be fitted with a dynamo for recharging the radio battery, and for other services.

(f) A searchlight shall be fitted in each motor lifeboat required to be carried under paragraph (a) of Regulation 8 of this Chapter in passenger ships and under paragraph (c) of that Regulation in ships employed as whale factory ships, fish processing or canning factory ships and ships engaged in the carriage of persons employed in the whaling, fish processing or canning industries.

(g) The searchlight shall include a lamp of at least 80 watts, an efficient reflector and a source of power which will give effective illumination of a light-coloured object having a width of about 60 feet (or 18 metres) at a distance of 200 yards (or 180 metres) for a total period of six hours and shall be capable of working for at least three hours continuously.

Regulation 15

Requirements for Inflatable Liferafts

(a) Every inflatable liferaft shall be so constructed that, when fully inflated and floating with the cover uppermost, it shall be stable in a seaway.

(b) The liferaft shall be so constructed that if it is dropped into the water from a height of 60 feet (or 18 metres) neither the liferaft nor its equipment will be damaged.

(c) The construction of the liferaft shall include a cover which shall automatically be set in place when the liferaft is inflated. This cover shall be capable of protecting the occupants against injury from exposure, and means shall be provided for collecting rain. The top of the cover shall be fitted with a lamp which derives its luminosity from a sea-activated cell and a similar lamp shall also be fitted inside the liferaft. The cover of the liferaft shall be of a highly visible colour.

(d) The liferaft shall be fitted with a painter and shall have a line securely becketed round the outside. A lifeline shall also be fitted around the inside of the liferaft.

(e) The liferaft shall be capable of being readily righted by one person if it inflates in an inverted position.

(f) The liferaft shall be fitted at each opening with efficient means to enable persons in the water to climb on board.
(g) The liferaft shall be contained in a valise or other container so constructed as to be capable of withstanding hard wear under conditions met with at sea. The liferaft in its valise or other container shall be inherently buoyant.

(h) The buoyancy of the liferaft shall be so arranged as to ensure by a division into an even number of separate compartments, half of which shall be capable of supporting out of the water the number of persons which the liferaft is permitted to accommodate, or by some other equally efficient means, that there is a reasonable margin of buoyancy if the raft is damaged or partially fails to inflate.

(i) The total weight of the liferaft, its valise or other container and its equipment shall not exceed 400 lb. (or 180 kilogrammes).

(j) The number of persons which an inflatable liferaft shall be permitted to accommodate shall be equal to:

(i) the greatest whole number obtained by dividing by 3.4 the volume, measured in cubic feet (or by 96 the volume, measured in cubic decimetres) of the main buoyancy tubes (which for this purpose shall include neither the arches nor the thwart or thwarts if fitted) when inflated, or

(ii) the greatest whole number obtained by dividing by 4 the area, measured in square feet (or by 3,720 the area measured in square centimetres) of the floor (which for this purpose may include the thwart or thwarts if fitted) of the liferaft when inflated whichever number shall be the less.

(k) The floor of the liferaft shall be waterproof and shall be capable of being sufficiently insulated against cold.

(l) The liferaft shall be inflated by a gas which is not injurious to the occupants and the inflation shall take place automatically either on the pulling of a line or by some other equally simple and efficient method. Means shall be provided whereby the topping-up pump or bellows required by Regulation 17 of this Chapter may be used to maintain pressure.

(m) The liferaft shall be of approved material and construction, and shall be so constructed as to be capable of withstanding exposure for 30 days afloat in all sea conditions.

(n) No liferaft shall be approved which has a carrying capacity calculated in accordance with paragraph (j) of this Regulation of less than six persons. The maximum number of persons calculated in accordance with that paragraph for which an inflatable liferaft may be approved shall be at the discretion of the Administration, but shall in no case exceed 25.

(o) The liferaft shall be capable of operating throughout a temperature range of 150° F. to minus 22° F. (or 66° C. to minus 30° C.).

(p) The liferaft shall be so stowed as to be readily available in case of emergency.

(q) The liferaft shall be fitted with arrangements enabling it to be readily towed.
**Regulation 16**

**Requirements for Rigid Liferafts**

(a) Every rigid liferaft shall be so constructed that if it is dropped into the water from its stowed position neither the liferaft nor its equipment will be damaged.

(b) The deck area of the liferaft shall be situated within that part of the liferaft which affords protection to its occupants. The area of that deck shall be at least 4 square feet (or 3,720 square centimetres) for every person the liferaft is permitted to carry. The nature of the deck shall be such as to prevent so far as practicable the ingress of water and it shall effectively support the occupants out of the water.

(c) The liferaft shall be fitted with a cover or equivalent arrangement of a highly visible colour, which shall be capable of protecting the occupants against injury whichever way up the liferaft is floating.

(d) The equipment of the liferaft shall be so stowed as to be readily available whichever way up the liferaft is floating.

(e) The total weight of a liferaft and its equipment carried in passenger ships shall not exceed 400 lb. (or 180 kilogrammes). Liferafts carried in cargo ships may exceed 400 lb. (or 180 kilogrammes) in weight if they are capable of being launched from both sides of the ship or if there are provided means for putting them into the water mechanically.

(f) The liferaft must at all times be effective and stable when floating either way up.

(g) The liferaft shall have at least 3.4 cubic feet (or 96 cubic decimetres) of air cases or equivalent buoyancy for each person it is permitted to carry which must be placed as near as possible to the sides of the raft.

(h) The liferaft shall have a painter attached and a lifeline securely becketed round the outside. A lifeline shall also be fitted around the inside of the raft.

(i) The liferaft shall be fitted at each opening with efficient means to enable persons in the water to climb on board.

(j) The liferaft shall be so constructed as not to be affected by oil or oil products.

(k) A buoyant light of the electric battery type shall be attached to the liferaft by a lanyard.

(l) The liferaft shall be fitted with arrangements enabling it to be readily towed.

(m) Liferafts shall be so stowed as to float free in the event of the ship sinking.

**Regulation 17**

**Equipment of Inflatable and Rigid Liferafts**

(a) The normal equipment of every liferaft shall consist of:

(i) One buoyant rescue quoit, attached to at least 100 feet (or 30 metres) of buoyant line.
(ii) For liferafts which are permitted to accommodate not more than 12 persons; one knife and one baler; for liferafts which are permitted to accommodate 13 persons or more; two knives and two balers.

(iii) Two sponges.

(iv) Two sea-anchors, one permanently attached to the liferaft and one spare.

(v) Two paddles.

(vi) One repair outfit capable of repairing punctures in buoyancy compartments.

(vii) One topping-up pump or bellows, unless the liferaft complies with Regulation 16 of this Chapter.

(viii) Three tin-openers.

(ix) One approved first-aid outfit in a waterproof case.

(x) One rustproof graduated drinking vessel.

(xi) One waterproof electric torch suitable for signalling in the Morse Code, together with one spare set of batteries and one spare bulb in a waterproof container.

(xii) One daylight signalling mirror and one signalling whistle.

(xiii) Two parachute distress signals of an approved type, capable of giving a bright red light at a high altitude.

(xiv) Six hand flares of an approved type, capable of giving a bright red light.

(xv) One set of fishing tackle.

(xvi) A food ration, determined by the Administration, for each person the liferaft is permitted to accommodate.

(xvii) Watertight receptacles containing three pints (or one and a half litres) of fresh water for each person the liferaft is permitted to accommodate, of which one pint (or half a litre) per person may be replaced by a suitable de-salting apparatus capable of producing an equal amount of fresh water.

(xviii) Six anti-seasickness tablets for each person the liferaft is deemed fit to accommodate.

(xix) Instructions on how to survive in the liferaft; and

(xx) One copy of the illustrated table of life-saving signals referred to in Regulation 16 of Chapter V.

(b) In the case of passenger ships engaged on short international voyages of such duration that in the opinion of the Administration all the items specified in paragraph (a) are unnecessary, the Administration may allow one or more liferafts, not being less than one-sixth of the number of the liferafts carried in any such ship, to be provided with the equipment specified in sub-paragraphs (i) to (vii) inclusive, (xi) and (xix) of paragraph (a) of this Regulation, and with one-half of the equipment specified in sub-paragraphs (xiii)
and (xiv) of the said paragraph and the remainder of the liferafts carried to be provided with the equipment specified in sub-paragraphs (i) to (vii) inclusive and (xix) of the said paragraph.

The Administration shall so far as is practicable and reasonable take steps with a view to ensuring that crews of ships in which liferafts are carried are trained in their launching and use.

(a) Suitable arrangements shall be made for embarkation into the lifeboats, which shall include:

(i) a ladder at each set of davits to afford access to the lifeboats when waterborne, except that in passenger ships, ships employed as whale factory ships, ships employed as fish processing or canning factory ships and ships engaged in the carriage of persons employed in the whaling, fish processing or canning industries, the Administration may permit such ladders to be replaced by approved devices provided that there shall not be less than one ladder on each side of the ship;

(ii) means for illuminating the lifeboats and their launching gear during preparation for and the process of launching, and also for illuminating the water into which the lifeboats are launched until the process of launching is completed;

(iii) arrangements for warning the passengers and crew that the ship is about to be abandoned; and

(iv) means for preventing any discharge of water into the lifeboats.

(b) Suitable arrangements shall also be made for embarkation into the liferafts, which shall include:

(i) sufficient ladders to facilitate embarkation into the liferafts when waterborne except that in passenger ships, ships employed as whale factory ships, ships employed as fish processing or canning factory ships, and ships engaged in the carriage of persons employed in the whaling, fish processing or fish canning industries, the Administration may permit the replacement of some or all of such ladders by approved devices;

(ii) where there are carried liferafts for which approved launching devices are provided, means for illuminating those liferafts and launching devices during the preparation for and the process of launching, and also for illuminating the water into which those liferafts are launched until the process of launching is completed;

(iii) means for illuminating the stowage position of liferafts for which approved launching devices are not provided;
(iv) arrangements for warning the passengers and crew that the ship is about to be abandoned; and

(v) means for preventing any discharge of water into the liferafts at fixed launching positions, including those under approved launching devices.

**Regulation 20**

**MARKING OF LIFEBOATS, LIFERAFTS AND BUOYANT APPARATUS**

(a) The dimensions of a lifeboat and the number of persons which it is permitted to carry shall be marked on it in clear permanent characters. The name and port of registry of the ship to which the lifeboat belongs shall be painted on each side of the bow.

(b) Buoyant apparatus shall be marked with the number of persons in the same manner.

(c) The number of persons shall be marked in the same manner on inflatable liferafts and also on the valise or container in which the inflatable liferaft is contained. Every inflatable liferaft shall also bear a serial number and the manufacturer's name so that the owner of the liferaft can be ascertained.

(d) Every rigid liferaft shall be marked with the name and port of registry of the ship in which it is carried, and with the number of persons it is permitted to carry.

(e) No lifeboat, liferaft or buoyant apparatus shall be marked for a greater number of persons than that obtained in the manner specified in this Chapter.

**Regulation 21**

**SPECIFICATION OF A LIFEBUOY**

(a) A lifebuoy shall satisfy the following requirements:

(i) it shall be of solid cork or any other equivalent material;

(ii) it shall be capable of supporting in fresh water for 24 hours at least 32 lbs. (or 14.5 kilogrammes) of iron;

(iii) it shall not be adversely affected by oil or oil products;

(iv) it shall be of a highly visible colour;

(v) it shall be marked in block letters with the name and port of registry of the ship in which it is carried.

(b) Lifebuoys filled with rushes, cork shavings or granulated cork, or any other loose granulated material, or whose buoyancy depends upon air compartments which require to be inflated, are prohibited.
(c) Lifebuoys made of plastic or other synthetic compounds shall be capable of retaining their buoyant properties and durability in contact with sea water or oil products, or under variations of temperature or climatic changes prevailing in open sea voyages.

(d) Lifebuoys shall be fitted with becket securely seized. At least one lifebuoy on each side of the ship shall be fitted with a buoyant lifeline of at least 15 fathoms (or 27.5 metres) in length.

(e) In passenger ships not less than one-half of the total number of lifebuoys, and in no case less than six, and in cargo ships at least one-half of the total number of lifebuoys, shall be provided with efficient self-igniting lights.

(f) The self-igniting lights required by paragraph (e) of this Regulation shall be such that they cannot be extinguished by water. They shall be capable of burning for not less than 45 minutes and shall have a luminosity of not less than 3.5 lumens. They shall be kept near the lifebuoys to which they belong, with the necessary means of attachment. Self-igniting lights used in tankers shall be of an approved electric battery type.

(g) All lifebuoys shall be so placed as to be readily accessible to the persons on board, and at least two of the lifebuoys provided with self-igniting lights in accordance with paragraph (e) of this Regulation shall also be provided with an efficient self-activating smoke signal capable of producing smoke of a highly visible colour for at least 15 minutes, and shall be capable of quick release from the navigating bridge.

(h) Lifebuoys shall always be capable of being rapidly cast loose and shall not be permanently secured in any way.

Regulation 22

LIFEJACKETS

(a) Ships shall carry for every person on board a lifejacket of an approved type and, in addition, unless these lifejackets can be adapted for use by children, a sufficient number of lifejackets suitable for children.

(b) In addition to the lifejackets required by paragraph (a) there shall be carried on passenger ships lifejackets for 5 per cent. of the total number of persons on board. These lifejackets shall be stowed in a conspicuous place on deck.

(c) A lifejacket shall not be approved unless it satisfies the following requirements:

(i) It shall be constructed with proper workmanship and materials.
(ii) It shall be capable of supporting in fresh water for 24 hours 16.5 pounds (or 7.5 kilogrammes) of iron.
(iii) It shall be so constructed as to eliminate so far as possible all risk of its being put on incorrectly, except that it shall be capable of being worn inside out.

(iv) It shall provide support to the head so that the face of an unconscious person is held above the water with the body inclined backwards from its vertical position.

(v) It shall be capable of turning the body, on entering the water, to a safe floating position with the body inclined backwards from its vertical position.

(vi) It shall not be adversely affected by oil or oil products.

(vii) It shall be of a highly visible colour.

(viii) It shall be fitted with an approved whistle, firmly secured by a cord.

(d) A lifejacket, the buoyancy of which depends on inflation, may be permitted for use by the crews of all ships except passenger ships and tankers provided that:

(i) It has two separate air compartments, together capable of supporting in fresh water for 24 hours 33 pounds (or 15 kilogrammes) of iron, and each capable of so supporting 16·5 pounds (7·5 kilogrammes) of iron;

(ii) It is capable of being inflated both mechanically and by mouth; and

(iii) It complies with the requirements of sub-paragraphs (i), (iii), (iv), (v), (vi), (vii) and (viii) of paragraph (c) even if one air compartment is not inflated.

(e) Lifejackets shall be so placed as to be readily accessible and their position shall be plainly indicated.

Regulation 23

LINE-THROWING APPLIANCES

(a) Ships shall carry a line-throwing appliance of an approved type.

(b) The appliance shall be capable of carrying a line not less than 250 yards (or 230 metres) with reasonable accuracy, and shall include not less than four projectiles and four lines.

Regulation 24

SHIPS' DISTRESS SIGNALS

Ships shall be provided, to the satisfaction of the Administration, with means of making effective distress signals by day and by night, including at least twelve parachute signals capable of giving a bright red light at a high altitude.

Regulation 25

MUSTER LIST AND EMERGENCY PROCEDURE

(a) Special duties to be undertaken in the event of an emergency shall be allotted to each member of the crew.

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(b) The muster list shall show all the special duties and shall indicate, in particular, the station to which each member must go, and the duties that he has to perform.

(c) Before the vessel sails, the muster list shall be drawn up. Copies shall be posted in several parts of the ship, and in particular in the crew's quarters.

(d) The muster list shall show the duties assigned to the different members of the crew in connection with:

(i) the closing of the watertight doors, valves and closing mechanisms of scuppers, ash-shoots, and fire doors;

(ii) the equipping of the lifeboats (including the portable radio apparatus for survival craft) and the other life-saving appliances;

(iii) the launching of the lifeboats;

(iv) the general preparation of the other life-saving appliances;

(v) the muster of the passengers; and

(vi) the extinction of fire.

(e) The muster list shall show the several duties assigned to the members of the stewards' department in relation to the passengers in case of emergency. These duties shall include:

(i) warning the passengers;

(ii) seeing that they are suitably clad and have put on their lifejackets in a proper manner;

(iii) assembling the passengers at muster stations;

(iv) keeping order in the passages and on the stairways, and, generally, controlling the movements of the passengers; and

(v) ensuring that a supply of blankets is taken to the lifeboats.

(f) The muster list shall specify definite signals for calling all the crew to their boat, liferaft and fire stations, and shall give full particulars of these signals. These signals shall be made on the whistle or siren and, except on passenger ships on short international voyages and on cargo ships of less than 150 feet in length, they shall be supplemented by other signals which shall be electrically operated. All these signals shall be operable from the bridge.

Regulation 26

Practice Musters and Drills

(a) (i) In passenger ships, musters of the crew for boat drill and fire drill shall take place weekly when practicable and there shall be such a muster when a passenger ship leaves the final port of departure on an international voyage which is not a short international voyage.

(ii) In cargo ships, a muster of the crew for boat drill and fire drill shall take place at intervals of not more than one month, provided that a muster of the crew for boat
drill and fire drill shall take place within 24 hours of leaving a port if more than 25 per cent. of the crew have been replaced at that port.

(iii) On the occasion of the monthly muster in cargo ships the boats’ equipment shall be examined to ensure that it is complete.

(iv) The date upon which musters are held shall be recorded in such log book as may be prescribed by the Administration; and, if in any week (for passenger ships) or month (for cargo ships) no muster or a part muster only is held, an entry shall be made stating the circumstances and extent of the muster held. A report of the examination of the boats’ equipment on cargo ships shall be entered in the log book, which shall also record the occasions on which the lifeboats are swung out and lowered in compliance with paragraph (c) of this Regulation.

(b) In passenger ships, except those engaged on short international voyages, a muster of the passengers shall be held within twenty-four hours after leaving port.

(c) Different groups of lifeboats shall be used in turn at successive boat drills and every lifeboat shall be swung out and, if practicable and reasonable, lowered at least once every four months. The musters and inspections shall be so arranged that the crew thoroughly understand and are practised in the duties they have to perform, including instructions in the handling and operation of liferafts where these are carried.

(d) The emergency signal for summoning passengers to muster stations shall be a succession of seven or more short blasts followed by one long blast on the whistle or siren. This shall be supplemented in passenger ships, except those engaged on short international voyages, by other signals, which shall be electrically operated, throughout the ship operable from the bridge. The meaning of all signals affecting passengers, with precise instructions on what they are to do in an emergency, shall be clearly stated in appropriate languages on cards posted in their cabins and in conspicuous places in other passenger quarters.

Part B

PASSenger Ships ONLY

Regulation 27

Lifeboats, Liferafts and Buoyant Apparatus

(a) Passenger ships shall carry two boats attached to davits—one on each side of the ship—for use in an emergency. These boats shall be of an approved type and shall be not more than 28 feet (or 8½ metres) in length. They may be counted for the purposes of paragraphs (b) and (c) of this Regulation, provided that they comply fully with the
requirements for lifeboats of this Chapter, and for the purposes of Regulation 8 provided that in addition they comply fully with the requirements of Regulation 9 and where appropriate Regulation 14. They shall be kept ready for immediate use while the ship is at sea. In ships in which the requirements of paragraph (h) of Regulation 29 are met by means of appliances fitted to the sides of the lifeboats, such appliances shall not be required to be fitted to the two boats provided to meet the requirements of this Regulation.

(b) Passenger ships engaged on international voyages which are not short international voyages shall carry:

(i) lifeboats on each side of such aggregate capacity as will accommodate half the total number of persons on board.

Provided that the Administration may permit the substitution of lifeboats by liferafts of the same total capacity so however that there shall never be less than sufficient lifeboats on each side of the ship to accommodate $37\frac{1}{2}$ per cent. of all on board.

(ii) liferafts of sufficient aggregate capacity to accommodate 25 per cent. of the total number of persons on board, together with buoyant apparatus for 3 per cent. of that number.

Provided that ships which have a factor of subdivision of 0.33 or less shall be permitted to carry, in lieu of liferafts for 25 per cent. of all on board and buoyant apparatus for 3 per cent. of all on board, buoyant apparatus for 25 per cent. of that number.

(c) (i) A passenger ship engaged on short international voyages shall be provided with sets of davits in accordance with its length as specified in Column A of the Table in Regulation 28 of this Chapter. Each set of davits shall have a lifeboat attached to it and these lifeboats shall provide at least the minimum capacity required by Column C of the Table or the capacity required to provide accommodation for all persons on board if this is less.

Provided that when in the opinion of the Administration it is impracticable or unreasonable to place on a ship engaged on short international voyages the number of sets of davits required by Column A of the Table in Regulation 28, the Administration may authorise, under exceptional conditions, a smaller number of davits, except that this number shall never be less than the minimum number fixed by Column B of the Table, and that the total capacity of the lifeboats on the ship will be at least equal to the minimum capacity required by Column C or the capacity required to provide for all persons on board if this is less.

(ii) If the lifeboats so provided are not sufficient to accommodate all on board, additional lifeboats under davits or liferafts shall be provided so that the accommodation provided in the lifeboats and the liferafts in the ship shall be sufficient for all on board.
(iii) Notwithstanding the provisions of sub-paragraph (c) (ii) in any ship engaged on short international voyages the number of persons carried shall not exceed the total capacity of the lifeboats provided in accordance with sub-paragraphs (c) (i) and (c) (ii) of this Regulation unless the Administration considers that this is necessitated by the volume of traffic and then only if the ship complies with the provisions of paragraph (d) of Regulation 1 of Chapter II.

(iv) Where under the provisions of sub-paragraph (c) (iii) the Administration has permitted the carriage of persons in excess of the lifeboat capacity and is satisfied that it is impracticable in that ship to stow the liferafts carried in accordance with sub-paragraph (c) (ii) it may permit a reduction in the number of lifeboats.

Provided that;

(1) the number of lifeboats shall, in the case of ships of 190 feet (or 58 metres) in length and over, never be less than four, two of which shall be carried on each side of the ship, and in the case of ships of less than 190 feet (or 58 metres) in length, shall never be less than two, one of which shall be carried on each side of the ship; and

(2) the number of lifeboats and liferafts shall always be sufficient to accommodate the total number of persons on board.

(v) Every passenger ship engaged on short international voyages shall carry in addition to the lifeboats and liferafts required by the provisions of this paragraph, liferafts sufficient to accommodate 10 per cent. of the total number of persons for whom there is accommodation in the lifeboats carried in that ship.

(vi) Every passenger ship engaged on short international voyages shall also carry buoyant apparatus for at least 5 per cent. of the total number of persons on board.

(vii) The Administration may permit individual ships or classes of ships with short international voyage certificates to proceed on voyages in excess of 600 miles but not exceeding 1,200 miles if such ships comply with the provisions of paragraph (d) of Regulation 1 of Chapter II, if they carry lifeboats which provide for 75 per cent. of the persons on board and otherwise comply with the provisions of this paragraph.

Regulation 28

TABLE RELATING TO DAVITS AND LIFEBOAT CAPACITY FOR SHIPS ON SHORT INTERNATIONAL VOYAGES

The following table fixes according to the length of the ship—

(A) the minimum number of sets of davits to be provided on a ship engaged on short international voyages to each of which must be attached a lifeboat in accordance with Regulation 27 of this Chapter;
(B) the smaller number of sets of davits which may be authorised exceptionally on a ship engaged on short international voyages under Regulation 27; and

(C) the minimum lifeboat capacity required for a ship engaged on short international voyages.

<table>
<thead>
<tr>
<th>Registered Length of Ship</th>
<th>(A) Minimum Number of Sets of Davits</th>
<th>(B) Smaller Number of Sets of Davits authorised exceptionally</th>
<th>(C) Minimum Capacity of Lifeboats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet</td>
<td>Metres</td>
<td>Cubic Feet</td>
<td>Cubic Metres</td>
</tr>
<tr>
<td>100 and under 120</td>
<td>31 and under 37</td>
<td>2</td>
<td>400</td>
</tr>
<tr>
<td>120 and under 140</td>
<td>37 and under 43</td>
<td>2</td>
<td>650</td>
</tr>
<tr>
<td>140 and under 160</td>
<td>43 and under 49</td>
<td>2</td>
<td>900</td>
</tr>
<tr>
<td>160 and under 175</td>
<td>49 and under 53</td>
<td>3</td>
<td>1,150</td>
</tr>
<tr>
<td>175 and under 190</td>
<td>53 and under 58</td>
<td>3</td>
<td>1,350</td>
</tr>
<tr>
<td>190 and under 205</td>
<td>58 and under 63</td>
<td>4</td>
<td>1,550</td>
</tr>
<tr>
<td>205 and under 220</td>
<td>63 and under 67</td>
<td>4</td>
<td>1,750</td>
</tr>
<tr>
<td>220 and under 230</td>
<td>67 and under 70</td>
<td>5</td>
<td>1,850</td>
</tr>
<tr>
<td>230 and under 245</td>
<td>70 and under 75</td>
<td>5</td>
<td>2,150</td>
</tr>
<tr>
<td>245 and under 255</td>
<td>75 and under 78</td>
<td>6</td>
<td>2,400</td>
</tr>
<tr>
<td>255 and under 270</td>
<td>78 and under 82</td>
<td>6</td>
<td>2,700</td>
</tr>
<tr>
<td>270 and under 285</td>
<td>82 and under 87</td>
<td>7</td>
<td>3,000</td>
</tr>
<tr>
<td>285 and under 300</td>
<td>87 and under 91</td>
<td>7</td>
<td>3,300</td>
</tr>
<tr>
<td>300 and under 315</td>
<td>91 and under 96</td>
<td>8</td>
<td>3,600</td>
</tr>
<tr>
<td>315 and under 330</td>
<td>96 and under 101</td>
<td>8</td>
<td>3,900</td>
</tr>
<tr>
<td>330 and under 350</td>
<td>101 and under 107</td>
<td>9</td>
<td>4,300</td>
</tr>
<tr>
<td>350 and under 370</td>
<td>107 and under 113</td>
<td>9</td>
<td>4,750</td>
</tr>
<tr>
<td>370 and under 390</td>
<td>113 and under 119</td>
<td>10</td>
<td>5,150</td>
</tr>
<tr>
<td>390 and under 410</td>
<td>119 and under 125</td>
<td>10</td>
<td>5,550</td>
</tr>
<tr>
<td>410 and under 435</td>
<td>125 and under 133</td>
<td>12</td>
<td>6,050</td>
</tr>
<tr>
<td>435 and under 460</td>
<td>133 and under 140</td>
<td>12</td>
<td>6,550</td>
</tr>
<tr>
<td>460 and under 490</td>
<td>140 and under 149</td>
<td>14</td>
<td>7,150</td>
</tr>
<tr>
<td>490 and under 520</td>
<td>149 and under 159</td>
<td>14</td>
<td>7,500</td>
</tr>
<tr>
<td>520 and under 550</td>
<td>159 and under 168</td>
<td>16</td>
<td>8,400</td>
</tr>
</tbody>
</table>

Note on (C).—Where the length of the ship is under 100 feet (or 31 metres) or over 550 feet (or 168 metres) the minimum number of sets of davits and the cubic capacity of the lifeboats shall be prescribed by the Administration.

Regulation 29

Stowage and Handling of Lifeboats, Liferafts and Buoyant Apparatus

(a) Lifeboats and liferafts shall be stowed to the satisfaction of the Administration in such a way that:

(i) they can all be launched in the shortest possible time and in not more than 30 minutes;
(ii) they will not impede in any way the prompt handling of any of the other lifeboats, liferafts or buoyant apparatus or the marshalling of the persons on board at the launching stations, or their embarkation;

(iii) the lifeboats, and the liferafts for which approved launching devices are required to be carried, shall be capable of being put into the water loaded with their full complement of persons and equipment even in unfavourable conditions of trim and of 15 degrees of list either way; and

(iv) the liferafts for which approved launching devices are not required to be carried, and the buoyant apparatus, shall be capable of being put into the water even in unfavourable conditions of trim and of 15 degrees of list either way.

(b) Every lifeboat shall be attached to a separate set of davits.

(c) Lifeboats may only be stowed on more than one deck if proper measures are taken to prevent lifeboats on a lower deck being fouled by those stowed on a deck above.

(d) Lifeboats, and liferafts for which approved launching devices are required to be carried shall not be placed in the bow of the ship. They shall be stowed in such positions as to ensure safe launching having particular regard to clearance from the propeller and steeply overhanging portions of the hull aft.

(e) Davits shall be of approved design and shall be suitably placed to the satisfaction of the Administration. They shall be so disposed on one or more decks that the lifeboats placed under them can be safely lowered without interference from the operation of any other davits.

(f) Davits shall be as follows:

(i) luffing or gravity type for operating lifeboats weighing not more than 2 1/4 tons (or 2,300 kilogrammes) in their turning out condition;

(ii) gravity type for operating lifeboats weighing more than 2 1/4 tons (or 2,300 kilogrammes) in their turning out condition.

(g) Davits, falls, blocks and all other gear shall be of such strength that the lifeboats can be turned out manned by a launching crew and then safely lowered with the full complement of persons and equipment, with the ship listed to 15 degrees either way and with a 10 degrees trim.

(h) Skates or other suitable means shall be provided to facilitate launching the lifeboats against a list of 15 degrees.

(i) Means shall be provided for bringing the lifeboats against the ship's side and there holding them so that persons may be safely embarked.

(j) Lifeboats, together with the emergency boats required by Regulation 27 of this Chapter, shall be served by wire rope falls, together with winches of an approved type.
which, in the case of the emergency boats, shall be capable of quick recovery of those boats. Exceptionally, the Administration may allow manila rope falls or falls of another approved material with or without winches (except that the emergency boats shall be required to be served by winches which are capable of quick recovery of those boats) where they are satisfied that manila rope falls or falls of another approved material are adequate.

(k) At least two lifelines shall be fitted to the davit span, and the falls and lifelines shall be long enough to reach the water with the ship at its lightest sea-going draught and listed to 15 degrees either way. Lower fall blocks shall be fitted with a suitable ring or long link for attaching to the sling hooks unless an approved type of disengaging gear is fitted.

(l) Where mechanically-powered appliances are fitted for the recovery of the lifeboats, efficient hand gear shall also be provided. Where davits are recovered by action of the falls by power, safety devices shall be fitted which will automatically cut off the power before the davits come against the stops in order to avoid overstressing the wire rope falls or davits.

(m) Lifeboats attached to davits shall have the falls ready for service and arrangements shall be made for speedily, but not necessarily simultaneously, detaching the lifeboats from the falls. The point of attachment of the lifeboats to the falls shall be at such height above the gunwale as to ensure stability when lowering the lifeboats.

(n) (i) In passenger ships engaged on international voyages which are not short international voyages in which there are carried lifeboats and liferafts in accordance with sub-paragraph (b) (i) of Regulation 27 of this Chapter, there shall be provided approved launching devices sufficient in number in the opinion of the Administration to enable that number of liferafts which, together with the lifeboats, is required in accordance with that sub-paragraph to provide accommodation for all on board, to be put into the water loaded with the number of persons they are permitted to accommodate, in not more than thirty minutes in calm conditions. Approved launching devices so provided shall, so far as practicable, be distributed equally on each side of the ship and there shall never be less than one such device on each side. No such devices need, however, be provided for the additional liferafts required to be carried by sub-paragraph (b) (ii) of Regulation 27 of this Chapter for 25 per cent. of all on board, but every liferaft carried in accordance with that sub-paragraph shall, where an approved launching device is provided in the ship, be of a type which is capable of being launched from such a device.

(ii) In passenger ships engaged on short international voyages, the number of approved launching devices to be provided shall be at the discretion of the Administration. The number of liferafts allocated to each such device carried shall not be more than the number which, in the opinion of the Administration, can be put into the water fully loaded with the number of persons they are permitted to carry by that device in not more than 30 minutes in calm conditions.
Regulation 30

LIGHTING FOR DECKS, LIFEBOATS, LIFERAFTS, &c.

(a) Provision shall be made for an electric or equivalent system of lighting sufficient for all the requirements of safety in the different parts of a passenger ship, and particularly for decks on which the lifeboats and liferafts are stowed. The self-contained emergency source of electrical power required by Regulation 25 of Chapter II shall be capable of supplying where necessary this lighting system and also the lighting required by sub-paragraphs (a) (ii), (b) (ii) and (b) (iii) of Regulation 19 of this Chapter.

(b) The exit from every main compartment occupied by passengers or crew shall be continuously lighted by an emergency lamp. The power for these emergency lamps shall be so arranged that they will be supplied from the emergency source of power referred to in paragraph (a) of this Regulation in the event of failure of the main generating plant.

Regulation 31

MANNING OF LIFEBOATS AND LIFERAFTS

(a) A deck officer or certificated lifeboatman shall be placed in charge of each lifeboat and a second-in-command shall also be nominated. The person in charge shall have a list of the lifeboat's crew, and shall see that the men placed under his orders are acquainted with their several duties.

(b) A man capable of working the motor shall be assigned to each motor lifeboat.

(c) A man capable of working the radio and searchlight installations shall be assigned to each lifeboat carrying this equipment.

(d) A man practised in the handling and operation of liferafts shall be assigned to each liferaft carried, except where in ships engaged on short international voyages the Administration is satisfied that this is not practicable.

Regulation 32

CERTIFICATED LIFEBOATMEN

(a) In passenger ships there shall be, for every lifeboat carried in order to comply with this Chapter, a number of lifeboatmen at least equal to that specified in the following table:

<table>
<thead>
<tr>
<th>Prescribed Complement of Lifeboat</th>
<th>The Minimum Number of Certificated Lifeboatmen shall be</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 41 persons</td>
<td>2</td>
</tr>
<tr>
<td>From 41 to 61 persons</td>
<td>3</td>
</tr>
<tr>
<td>From 62 to 85 persons</td>
<td>4</td>
</tr>
<tr>
<td>Above 85 persons</td>
<td>5</td>
</tr>
</tbody>
</table>
(b) The allocation of the certificated lifeboatmen to each lifeboat remains within the discretion of the master.

(c) Certificates of efficiency shall be issued under the authority of the Administration. In order to obtain such a certificate an applicant shall prove that he has been trained in all the operations connected with launching lifeboats and other life-saving appliances and in the use of oars and propelling gear; that he is acquainted with the practical handling of lifeboats and of other life-saving equipment, and further, that he is capable of understanding and answering the orders relative to all kinds of life-saving appliances.

Regulation 33
BUOYANT APPARATUS

(a) No type of buoyant apparatus shall be approved unless it satisfies the following conditions:

(i) It shall be of such size and strength that it can be thrown from the place where it is stowed into the water without being damaged.

(ii) It shall not exceed 400 lbs. in weight (or 180 kilogrammes) unless suitable means to the satisfaction of the Administration are provided to enable it to be launched without lifting by hand.

(iii) It shall be of approved material and construction.

(iv) It shall be effective and stable when floating either way up.

(v) The air cases or equivalent buoyancy shall be placed as near as possible to the sides of the apparatus, and such buoyancy shall not be dependent upon inflation.

(vi) It shall be fitted with a painter and have a line securely becketed round the outside.

(b) The number of persons for which buoyant apparatus is certified shall be the number,

(i) ascertained by dividing the number of punds of iron which it is capable of supporting in fresh water by 32 (or the number of kilogrammes divided by 14.5), or

(ii) equal to the number of feet (equivalent to 30.5 centimetres) in the perimeter, whichever is the less.

Regulation 34
NUMBER OF LIFEBUOYS TO BE PROVIDED

The minimum number of lifebuoys with which passenger ships are provided shall be fixed by the following table:

<table>
<thead>
<tr>
<th>Length of Ship</th>
<th>Minimum Number of Buoys</th>
</tr>
</thead>
<tbody>
<tr>
<td>in Feet</td>
<td>in Metres</td>
</tr>
<tr>
<td>Under 200</td>
<td>Under 61</td>
</tr>
<tr>
<td>200 and under 400</td>
<td>61 and under 122</td>
</tr>
<tr>
<td>400 and under 600</td>
<td>122 and under 183</td>
</tr>
<tr>
<td>600 and under 800</td>
<td>183 and under 244</td>
</tr>
<tr>
<td>800 and over</td>
<td>244 and over</td>
</tr>
</tbody>
</table>
Part C

CARGO SHIPS ONLY

Regulation 35

NUMBER AND CAPACITY OF LIFEBOATS AND LIFERAFTS

(a) (i) Every cargo ship, except tankers of 1,600 tons gross tonnage and upwards, ships employed as whale factory ships, fish processing or canning factory ships, and ships engaged in the carriage of persons employed in the whaling, fish processing or canning industries, shall carry lifeboats on each side of the ship of such aggregate capacity as will accommodate all persons on board, and in addition shall carry liferafts sufficient to accommodate half that number.

Provided that, in the case of such cargo ships engaged on international voyages between near neighbouring countries, the Administration, if it is satisfied that the conditions of the voyage are such as to render the compulsory carriage of liferafts unreasonable or unnecessary, may to that extent exempt individual ships or classes of ships from this requirement.

(ii) Every tanker of 1,600 tons gross tonnage and upwards shall carry lifeboats on each side of the ship of such aggregate capacity as will accommodate all persons on board.

(b) (i) Every ship employed as a whale factory ship, every ship employed as a fish processing or canning factory ship and every ship engaged in the carriage of persons employed in the whaling, fish processing or canning industries shall carry—

(1) Lifeboats on each side of such aggregate capacity as will accommodate half the total number of persons on board.

Provided that the Administration may permit the substitution of lifeboats by liferafts of the same total capacity so however that there shall never be less than sufficient lifeboats on each side of the ship to accommodate 37 1/2 per cent. of all on board.

(2) Liferafts of sufficient aggregate capacity to accommodate half the total number of persons on board.

Provided that, if in ships employed as fish processing or canning factory ships, it is impracticable to carry lifeboats which comply fully with the requirements of this Chapter, the Administration may permit instead the carriage of other boats, which shall however provide not less than the accommodation required by this Regulation and shall have at least the buoyancy and equipment required by this Chapter for lifeboats.

(ii) Every ship employed as a whale factory ship, every ship employed as a fish processing or canning factory ship and every ship engaged in the carriage of persons em-
ployed in the whaling, fish processing or canning industries shall carry two boats—one on each side—for use in an emergency. These boats shall be of an approved type and shall be not more than 28 feet (or 8½ metres) in length. They may be counted for the purposes of this paragraph provided that they comply fully with the requirements for lifeboats of this Chapter and for the purposes of Regulation 8 provided that in addition they comply with the requirements of Regulation 9, and, where appropriate, Regulation 14. They shall be kept ready for immediate use while the ship is at sea. In ships in which the requirements of paragraph (g) of Regulation 36 are met by means of appliances fitted to the sides of the lifeboats, such appliances shall not be required to be fitted to the two boats provided to meet the requirements of this Regulation.

(c) Every tanker of 3,000 tons gross tonnage and upwards shall carry not less than four lifeboats. Two lifeboats shall be carried aft and two amidships, except that in tankers which have no amidships superstructure all lifeboats shall be carried aft.

Provided that, if in the case of tankers with no amidships superstructure it is impracticable to carry four lifeboats aft, the Administration may permit instead the carriage aft of one lifeboat on each side of the ship. In such a case:

(i) each such lifeboat shall not exceed 26 feet (or 8 metres) in length;
(ii) each such lifeboat shall be stowed as far forward as practicable, but at least so far forward that the after end of the lifeboat is one-and-a-half times the length of the lifeboat forward of the propeller;
(iii) each lifeboat shall be stowed as near the sea level as is safe and practicable; and
(iv) there shall be carried in addition liferafts sufficient to accommodate at least one-half of the total number of persons on board.

Regulation 36

DAVITS AND LAUNCHING ARRANGEMENTS

(a) In cargo ships lifeboats and liferafts shall be stowed to the satisfaction of the Administration.

(b) Every lifeboat shall be attached to a separate set of davits.

(c) Lifeboats, and liferafts for which approved launching devices are required to be carried, shall not be placed in the bow of the ship. They shall be stowed in such positions as to ensure safe launching, having particular regard to clearance from the propeller and steeply overhanging portions of the hull aft, with the object of ensuring so far as practicable that they are capable of being launched down the straight side of the ship.

(d) Davits shall be of approved design and shall be suitably placed to the satisfaction of the Administration.
(e) In tankers of 1,600 tons gross tonnage and upwards, ships employed as whale factory ships, ships employed as fish processing or canning factory ships and ships engaged in the carriage of persons employed in the whaling, fish processing or canning industries, all davits shall be of the gravity type. In other ships, davits shall be as follows:

(i) luffing or gravity type for operating lifeboats weighing not more than 2 1/4 tons (or 2,300 kilogrammes) in their turning out condition;

(ii) gravity type for operating lifeboats weighing more than 2 1/4 tons (or 2,300 kilogrammes) in their turning out condition.

(f) Davits, falls, blocks and all other gear shall be of such strength that the lifeboats can be turned out manned by a launching crew and then safely lowered with the full complement of persons and equipment, with the ship listed to 15 degrees either way, and with a 10 degrees trim.

(g) Skates or other suitable means shall be provided to facilitate launching the lifeboats against a list of 15 degrees.

(h) Means shall be provided for bringing the lifeboats against the ship's side and there holding them so that persons may be safely embarked.

(i) Lifeboats, together with the emergency boats required by sub-paragraph (b) (ii) of Regulation 35 of this Chapter, shall be served by wire rope falls, together with winches of an approved type which, in the case of the emergency boats, shall be capable of quick recovery of those boats. Exceptionally, the Administration may allow manila rope falls or falls of another approved material with or without winches (except that the emergency boats shall be required to be served by winches which are capable of quick recovery of those boats) where they are satisfied that manila rope falls or falls of another approved material are adequate.

(j) At least two lifelines shall be fitted to the davit spans, and the falls and lifelines shall be long enough to reach the water with the ship at its lightest sea-going draught and listed to 15 degrees either way. Lower fall blocks shall be fitted with a suitable ring or long link for attaching to the sling hooks unless an approved type of disengaging gear is fitted.

(k) Where mechanically powered appliances are fitted for the recovery of the lifeboats, efficient hand gear shall also be provided. Where davits are recovered by action of the falls by power, safety devices shall be fitted which will automatically cut off the power before the davits come against the stops in order to avoid overstressing the wire rope falls or davits.

(l) Lifeboats shall have the falls ready for service, and arrangements shall be made for speedily, but not necessarily simultaneously, detaching the lifeboats from the falls.
The point of attachment of the lifeboats to the falls shall be at such height above the 
gunwale as to ensure stability when lowering the lifeboats.

(m) In ships employed as whale factory ships, ships employed as fish processing or 
canning factory ships and ships engaged in the carriage of persons employed in the whaling, 
fish processing or canning industries, in which there are carried lifeboats and liferafts 
in accordance with sub-paragraph (i) (2) of paragraph (b) of Regulation 35 no approved 
launching devices need be provided for the liferafts, but there shall be provided such 
devices sufficient in number, in the opinion of the Administration, to enable the liferafts 
carried in accordance with sub-paragraph (i) (1) of that paragraph to be put into the 
water loaded with the number of persons they are permitted to accommodate, in not 
more than 30 minutes in calm conditions. Approved launching devices so provided 
shall, so far as practicable, be distributed equally on each side of the ship. Every 
liferaft carried on ships in which an approved launching device is required to be provided 
shall be of a type which is capable of being launched by such a device.

Regulation 37

Number of Lifebuoys to be Provided

At least eight lifebuoys of a type which satisfies the requirements of Regulation 21 
of this Chapter shall be carried.

Regulation 38

Emergency Lighting

The lighting required by sub-paragraphs (a) (ii), (b) (ii) and (b) (iii) of Regulation 19 of this Chapter shall be capable of being supplied for at least three hours by the 
emergency source of power required by Regulation 26 of Chapter II. In cargo ships of 
1,600 tons gross tonnage and upwards the Administration shall ensure that the lighting 
of the alleyways, stairways and exits is such that the access of all persons on board to the 
launching stations and stowage positions of lifeboats and liferafts is not impeded.

CHAPTER IV

Radiotelegraphy and Radiotelephony

Part A

Application and Definitions

Regulation 1

Application

(a) Unless expressly provided otherwise, this Chapter applies to all ships to which 
the present Regulations apply.
(b) This Chapter does not apply to ships to which the present Regulations would otherwise apply while such ships are being navigated within the Great Lakes of North America and their connecting and tributary waters as far east as the lower exit of the St. Lambert Lock at Montreal in the Province of Quebec, Canada.*

(c) No provision in this Chapter shall prevent the use by a ship or survival craft in distress of any means at its disposal to attract attention, make known its position and obtain help.

Regulation 2

TERMS AND DEFINITIONS

For the purpose of this Chapter the following terms shall have the meanings defined below. All other terms which are used in this Chapter and which are also defined in the Radio Regulations shall have the same meanings as defined in those Regulations:

(a) “Radio Regulations” means the Radio Regulations annexed to, or regarded as being annexed to, the most recent International Telecommunication Convention which may be in force at any time.

(b) “Radiotelegraph auto alarm” means an automatic alarm receiving apparatus which responds to the radiotelegraph alarm signal and has been approved.

(c) “Radio officer” means a person holding at least a first or second class radiotelegraph operator's certificate complying with the provisions of the Radio Regulations, who is employed in the radiotelegraph station of a ship which is provided with such a station in compliance with the provisions of Regulation 3 or Regulation 4 of this Chapter.

(d) “Radiotelephone operator” means a person holding an appropriate certificate complying with the provisions of the Radio Regulations.

(e) “Existing installation” means:

(i) an installation wholly installed on board a ship before the date on which the present Convention comes into force, irrespective of the date on which acceptance by the respective Administration takes effect; and

(ii) an installation part of which was installed on board a ship before the date of coming into force of the present Convention and the rest of which consists either of parts installed in replacement of identical parts, or parts which comply with the requirements of this Chapter.

(f) “New installation” means any installation which is not an existing installation.

* Such ships are subject to special requirements relative to radio for safety purposes, the present requirements being contained in the United States—Canadian agreement of 1952, entitled: "Promotion of Safety on the Great Lakes by Means of Radio." [For the text of this Agreement, see United Nations, Treaty Series, Vol. 205, p. 283.]
Regulation 3

Radiotelegraph Station

Passenger ships irrespective of size and cargo ships of 1,600 tons gross tonnage and upwards, unless exempted under Regulation 5 of this Chapter, shall be fitted with a radiotelegraph station complying with the provisions of Regulations 8 and 9 of this Chapter.

Regulation 4

Radiotelephone Station

Cargo ships of 300 tons gross tonnage and upwards but less than 1,600 tons gross tonnage, unless fitted with a radiotelegraph station complying with the provisions of Regulations 8 and 9 of this Chapter shall, provided they are not exempted under Regulation 5 of this Chapter, be fitted with a radiotelephone station complying with the provisions of Regulations 14 and 15 of this Chapter.

Regulation 5

Exemptions from Regulations 3 and 4

(a) The Contracting Governments consider it highly desirable not to deviate from the application of Regulations 3 and 4 of this Chapter; nevertheless the Administration may grant to individual passenger or cargo ships exemptions of a partial and/or conditional nature, or complete exemption from the requirements of Regulation 3 or Regulation 4 of this Chapter.

(b) The exemptions permitted under paragraph (a) of this Regulation shall be granted only to a ship engaged on a voyage where the maximum distance of the ship from the shore, the length of the voyage, the absence of general navigational hazards, and other conditions affecting safety are such as to render the full application of Regulation 3 or Regulation 4 of this Chapter unreasonable or unnecessary. When deciding whether or not to grant exemptions to individual ships, Administrations shall have regard to the effect that exemptions may have upon the general efficiency of the distress service for the safety of all ships. Administrations should bear in mind the desirability of requiring ships which are exempted from the requirement of Regulation 3 of this Chapter to be fitted with a radiotelephone station which complies with the provisions of Regulations 14 and 15 of this Chapter as a condition of exemption.

(c) Each Administration shall submit to the Organization as soon as possible after the first of January in each year a report showing all exemptions granted under paragraphs (a) and (b) of this Regulation during the previous calendar year and giving the reasons for granting such exemptions.
Part B

WATCHES

Regulation 6

WATCHES—Radiotelegraph

(a) Each ship which in accordance with Regulation 3 or Regulation 4 of this Chapter is fitted with a radiotelegraph station shall, while at sea, carry at least one radio officer and, if not fitted with a radiotelegraph auto alarm, shall, subject to the provisions of paragraph (d) of this Regulation, listen continuously on the radiotelegraph distress frequency by means of a radio officer using headphones or a loud-speaker.

(b) Each passenger ship which in accordance with Regulation 3 of this Chapter is fitted with a radiotelegraph station, if fitted with a radiotelegraph auto alarm, shall, subject to the provisions of paragraph (d) of this Regulation, and while at sea, listen on the radiotelegraph distress frequency by means of a radio officer using headphones or a loud-speaker, as follows:

(i) if carrying or certificated to carry 250 passengers or less, at least 8 hours listening a day in the aggregate;

(ii) if carrying or certificated to carry more than 250 passengers and engaged on a voyage exceeding 16 hours duration between two consecutive ports, at least 16 hours listening a day in the aggregate. In this case the ship shall carry at least two radio officers;

(iii) if carrying or certificated to carry more than 250 passengers and engaged on a voyage of less than 16 hours duration between two consecutive ports, at least 8 hours listening a day in the aggregate.

(c) (i) Each cargo ship which in accordance with Regulation 3 of this Chapter is fitted with a radiotelegraph station, if fitted with a radiotelegraph auto alarm, shall, subject to the provisions of paragraph (d) of this Regulation, and while at sea, listen on the radiotelegraph distress frequency by means of a radio officer using headphones or a loud-speaker, for at least 8 hours a day in the aggregate. However, Administrations may on cargo ships of 1,600 tons gross tonnage and upwards but less than 3,500 tons gross tonnage permit the hours of listening to be limited to not less than 2 hours a day in the aggregate for a period of three years from the date of coming into force of the present Convention.

(ii) Each cargo ship of 300 tons gross tonnage and upwards but less than 1,600 tons gross tonnage which is fitted with a radiotelegraph station as a consequence of Regulation 4 of this Chapter, if fitted with a radiotelegraph auto alarm shall, subject to the provisions of paragraph (d) of this Regulation, and while at sea, listen on the radiotelegraph distress frequency by means of a radio officer using headphones or a loud-speaker, during such periods as may be determined by the Administration. Administrations shall, however, have regard to the desirability of requiring, whenever practicable, a listening watch of at least 8 hours a day in the aggregate.
During the period when a radio officer is required by this Regulation to listen on the radiotelegraph distress frequency the radio officer may discontinue such listening during the time when he is handling traffic on other frequencies, or performing other essential radio duties, but only if it is impracticable to listen by split headphones or loud-speaker. The listening watch shall always be maintained by a radio officer using headphones or loud-speaker during the silence periods provided for by the Radio Regulations.

In all ships fitted with a radiotelegraph auto alarm this radiotelegraph auto alarm shall, while the ship is at sea, be in operation whenever there is no listening being kept under paragraphs (b), (c) or (d) of this Regulation and, whenever practicable, during direction-finding operations.

The listening periods provided for by this Regulation, including those which are determined by the Administration, should be maintained preferably during periods prescribed for the radiotelegraph service by the Radio Regulations.

Regulation 7

Watches—Radiotelephone

Each ship which is fitted with a radiotelephone station in accordance with Regulation 4 of this Chapter shall, for safety purposes, carry at least one radiotelephone operator (who may be the master, an officer or a member of the crew holding only a certificate for radiotelephony) and shall, subject to the provisions of paragraph (b) of this Regulation, while at sea, maintain continuous listening watch on the radiotelephone distress frequency, in the place on board from which the ship is usually navigated, using a loud-speaker or other appropriate means.

Listening may be discontinued
(i) when the receiving equipment is being used for traffic on another frequency and a second receiver is not available; or
(ii) when, in the opinion of the master, conditions are such that maintenance of the listening watch would interfere with the safe navigation of the ship.

Listening watch should, however, as far as possible be maintained during the silence periods provided for in the Radio Regulations.

Part C

Technical Requirements

Regulation 8

Radiotelegraph Stations

The radiotelegraph station shall be so located that no harmful interference from extraneous mechanical or other noise will be caused to the proper reception of radio signals. The station shall be placed as high in the ship as is practicable, so that the greatest possible degree of safety may be secured.
(b) The radiotelegraph operating room shall be of sufficient size and of adequate ventilation to enable the main and reserve radiotelegraph installations to be operated efficiently, and shall not be used for any purpose which will interfere with the operation of the radiotelegraph station.

(c) The sleeping accommodation of at least one radio officer shall be situated as near as practicable to the radiotelegraph operating room. In new ships, this sleeping accommodation shall not be within the radiotelegraph operating room.

(d) There shall be provided between the radiotelegraph operating room and the bridge and one other place, if any, from which the ship is navigated, an efficient two-way system for calling and voice communication which shall be independent of the main communication system on the ship.

(e) The radiotelegraph installation shall be installed in such a position that it will be protected against the harmful effects of water or extremes of temperature. It shall be readily accessible both for immediate use in case of distress and for repair.

(f) A reliable clock with a dial not less than five inches (or 12-5 centimetres) in diameter and a concentric seconds hand, the face of which is marked to indicate the silence periods prescribed for the radiotelegraph service by the Radio Regulations, shall be provided. It shall be securely mounted in the radiotelegraph operating room in such a position that the entire dial can be easily and accurately observed by the radio officer from the radiotelegraph operating position and from the position for testing the radiotelegraph auto alarm receiver.

(g) A reliable emergency light shall be provided in the radiotelegraph operating room, consisting of an electric lamp permanently arranged so as to provide satisfactory illumination of the operating controls of the main and reserve radiotelegraph installations and of the clock required by paragraph (f) of this Regulation. In new installations, this lamp shall, if supplied from the reserve source of energy required by sub-paragraph (iii) of paragraph (a) of Regulation 9 of this Chapter, be controlled by two-way switches placed near the main entrance to the radiotelegraph operating room and at the radiotelegraph operating position, unless the layout of the radiotelegraph operating room does not warrant it. These switches shall be clearly labelled to indicate their purpose.

(h) Either an electric inspection lamp, operated from the reserve source of energy required by sub-paragraph (iii) of paragraph (a) of Regulation 9 of this Chapter and provided with a flexible lead of adequate length, or a flashlight shall be provided and kept in the radiotelegraph operating room.

(i) The radiotelegraph station shall be provided with such spare parts, tools and testing equipment as will enable the radiotelegraph installation to be maintained in efficient working condition while at sea. The testing equipment shall include an instrument or instruments for measuring A. C. volts, D. C. volts and ohms.

(j) If a separate emergency radiotelegraph operating room is provided the requirements of paragraphs (d), (e), (f), (g) and (h) of this Regulation shall apply to it.
Regulation 9

Radiotelegraph Installations

(a) Except as otherwise expressly provided in this Regulation—

(i) The radiotelegraph station shall include a main installation and a reserve installation, electrically separate and electrically independent of each other.

(ii) The main installation shall include a main transmitter, main receiver and main source of energy.

(iii) The reserve installation shall include a reserve transmitter, reserve receiver and reserve source of energy.

(iv) A main and a reserve aerial shall be provided and installed, provided that the Administration may except any ship from the provision of a reserve aerial if it is satisfied that the fitting of such an aerial is impracticable or unreasonable, but in such case a suitable spare aerial completely assembled for immediate installation shall be carried. In addition, sufficient aerial wire and insulators shall in all cases be provided to enable a suitable aerial to be erected.

The main aerial, of suspended between supports liable to whipping, shall be suitably protected against breakage.

(b) In installations on cargo ships (except those on cargo ships of 1,600 tons gross tonnage and upwards installed on or after 19 November, 1952), if the main transmitter complies with all the requirements for the reserve transmitter, the latter is not obligatory.

(c) (i) The main and reserve transmitters shall be capable of being quickly connected with and tuned to the main aerial, and the reserve aerial if one is fitted.

(ii) The main and reserve receivers shall be capable of being quickly connected with any aerial with which they are required to be used.

(d) All parts of the reserve installation shall be placed as high in the ship as is practicable, so that the greatest possible degree of safety may be secured.

(e) The main and reserve transmitters shall be capable of transmitting on the radiotelegraph distress frequency using a class of emission assigned by the Radio Regulations for that frequency. In addition, the main transmitter shall be capable of transmitting on at least two of the frequencies, and of using a class of emission, which, in accordance with the Radio Regulations, may be used for the transmission of safety messages in the bands between 405 kc/s and 535 kc/s. The reserve transmitter may consist of a ship's emergency transmitter, as defined in, and limited in use by, the Radio Regulations.

(f) The main and reserve transmitters shall, if modulated emission is prescribed by the Radio Regulations, have a depth of modulation of not less than 70 per cent. and a note frequency between 450 and 1,350 cycles per second.

No. 7794
(g) The main and reserve transmitters shall, when connected to the main aerial, have a minimum normal range as specified below, that is to say, they must be capable of transmitting clearly perceptible signals from ship to ship by day and under normal conditions and circumstances over the specified ranges* (Clearly perceptible signals will normally be received if the R. M. S. value of the field strength at the receiver is at least 50 microvolts per metre.)

<table>
<thead>
<tr>
<th>Minimum normal range in miles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main transmitter</strong></td>
</tr>
<tr>
<td>All passenger ships, and cargo ships of 1,600 tons gross tonnage and upwards</td>
</tr>
<tr>
<td>Cargo ships below 1,600 tons gross tonnage</td>
</tr>
</tbody>
</table>

(h) (i) The main and reserve receivers shall be capable of receiving the radiotelegraph distress frequency and the class of emission assigned by the Radio Regulations for that frequency.

(ii) In addition, the main receiver shall permit the reception of such of the frequencies and classes of emission used for the transmission of time signals, meteorological messages

* In the absence of a direct measurement of the field strength the following data may be used as a guide for approximately determining the normal range:

<table>
<thead>
<tr>
<th>Normal range in miles</th>
<th>Metre-amperes†</th>
<th>Total aerial power (watts)‡‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>128</td>
<td>200</td>
</tr>
<tr>
<td>175</td>
<td>102</td>
<td>125</td>
</tr>
<tr>
<td>150</td>
<td>76</td>
<td>71</td>
</tr>
<tr>
<td>125</td>
<td>58</td>
<td>41</td>
</tr>
<tr>
<td>100</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>75</td>
<td>34</td>
<td>14</td>
</tr>
</tbody>
</table>

† This figure represents the product of the maximum height of the aerial above the deepest load water line in metres and the aerial current in amperes (R.M.S. value).

The values given in the second column of the table correspond to an average value of the ratio

\[
\frac{\text{Effective aerial height}}{\text{Maximum aerial height}} = 0.47
\]

This ratio varies with local conditions of the aerial and may vary between about 0.3 and 0.7

‡‡ The values given in the third column of the table correspond to an average value of the ratio

\[
\frac{\text{Radiated aerial power}}{\text{Total aerial power}} = 0.08
\]

This ratio varies considerably according to the values of effective aerial height and aerial resistance.
and such other communications relating to safety of navigation as may be considered necessary by the Administration.

(iii) For a period not exceeding five years from the date of coming into force of the present Convention, the radiotelegraph auto alarm receiver may be used as the reserve receiver if capable of effectively producing signals in headphones or a loud-speaker with which it is connected for this purpose. When so used, it shall be connected to the reserve source of energy.

(i) The main receiver shall have sufficient sensitivity to produce signals in headphones or by means of a loud-speaker when the receiver input is as low as 50 microvolts. The reserve receiver shall, except in cases where a radiotelegraph auto alarm receiver is used for this purpose, have sufficient sensitivity to produce such signals when the receiver input is as low as 100 microvolts.

(j) There shall be available at all times, while the ship is at sea, a supply of electrical energy sufficient to operate the main installation over the normal range required by paragraph (g) of this Regulation as well as for the purpose of charging any batteries forming part of the radiotelegraph station. The voltage of the supply for the main installation shall, in the case of new ships, be maintained within ±10 per cent. of the rated voltage. In the case of existing ships, it shall be maintained as near the rated voltage as possible and, if practicable, within ±10 per cent.

(k) The reserve installation shall be provided with a source of energy independent of the propelling power of the ship and of the ship’s electrical system. The Administration may delay the application of the requirement for a reserve source of energy for a period not exceeding three years from the date of coming into force of the present Convention, in the case of existing installations on those cargo ships of 500 tons gross tonnage and upwards but less than 1,600 tons gross tonnage which were excepted, prior to the date of the coming into force of the present Convention, from the requirement to be provided with a reserve source of energy.

(l) The reserve source of energy shall preferably consist of accumulator batteries, which may be charged from the ship’s electrical system, and shall under all circumstances be capable of being put into operation rapidly and of operating the reserve transmitter and receiver for at least six hours continuously under normal working conditions besides any of the additional loads mentioned in paragraphs (m) and (n) of this Regulation.*

(m) The reserve source of energy shall be used to supply the reserve installation and the automatic alarm signal keying device specified in paragraph (r) of this Regulation if it is electrically operated.

* For the purpose of determining the electrical load to be supplied by the reserve source of energy, the following formula is recommended as a guide:

\[ \text{Load} = \frac{1}{2} \text{transmitter current consumption with the key down (mark)} + \frac{1}{2} \text{transmitter current consumption with the key up (space)} + \text{current consumption of receiver and additional circuits connected to the reserve source of energy}. \]
The reserve source of energy may also be used to supply:

(i) the radiotelegraph auto alarm;
(ii) the emergency light specified in paragraph (g) of Regulation 8 of this Chapter;
(iii) the direction-finder;
(iv) any device, prescribed by the Radio Regulations, to permit changeover from transmission to reception and vice versa.

Subject to the provisions of paragraph (n) of this Regulation, the reserve source of energy shall not be used other than for the purposes specified in this paragraph.

(n) Notwithstanding the provisions of paragraph (m) of this Regulation, the Administration may authorise the use in cargo ships of the reserve source of energy for a small number of low-power emergency circuits which are wholly confined to the upper part of the ship, such as emergency lighting on the boat deck, on condition that these can be readily disconnected if necessary, and that the source of energy is of sufficient capacity to carry the additional load or loads.

(o) The reserve source of energy and its switchboard shall be as high as practicable in the ship and readily accessible to the radio officer. The switchboard shall, wherever possible, be situated in a radio room; if it is not, it shall be capable of being illuminated.

(p) While the ship is at sea, accumulator batteries, whether forming part of the main installation or reserve installation, shall be brought up to the normal fully-charged condition daily.

(q) All steps shall be taken to eliminate so far as is possible the causes of, and to suppress, radio interference from electrical and other apparatus on board. If necessary, steps shall be taken to ensure that the aerials attached to broadcast receivers do not cause interference to the efficient or correct working of the radiotelegraph installation. Particular attention shall be paid to this requirement in the design of new ships.

(r) In addition to a means for manually transmitting the radiotelegraph alarm signal, an automatic radiotelegraph alarm signal keying device shall be provided, capable of keying the main and the reserve transmitters so as to transmit the radiotelegraph alarm signal. The device shall be capable of being taken out of operation at any time in order to permit immediate manual operation of the transmitter. If electrically operated, this keying device shall be capable of operation from the reserve source of energy.

(s) At sea, the reserve transmitter, if not used for communications, shall be tested daily using a suitable artificial aerial, and at least once during each voyage using the reserve aerial if installed. The reserve source of energy shall also be tested daily.
(t) All equipments forming part of the radiotelegraph installation shall be reliable, and shall be so constructed that they are readily accessible for maintenance purposes.

(u) Notwithstanding the provision of Regulation 4 of this Chapter, the Administration may, in the case of cargo ships below 1,600 tons gross tonnage, relax the full requirements of Regulation 8 of this Chapter and the present Regulation, provided that the standard of the radiotelegraph station shall in no case fall below the equivalent of that prescribed under Regulation 14 and Regulation 15 this Chapter for radiotelephone stations, so far as applicable. In particular, in the case of cargo ships of 300 tons gross tonnage and upwards but less than 500 tons gross tonnage, the Administration need not require:

(i) a reserve receiver;
(ii) a reserve source of energy in existing installations;
(iii) protection of the main aerial against breakage by whipping;
(iv) the means of communication between the radiotelegraph station and the bridge to be independent of the main communication system;
(v) the range of the transmitter to be greater than 75 miles.

Regulation 10

Radiotelegraph Auto Alarms

(a) Any radiotelegraph auto alarm installed after the date of coming into force of the present Convention shall comply with the following minimum requirements:

(i) In the absence of interference of any kind it shall be capable of being actuated, without manual adjustment, by any radiotelegraph alarm signal transmitted on the radiotelegraph distress frequency by any coast station, ship's emergency or survival craft transmitter operating in accordance with the Radio Regulations, provided that the strength of the signal at the receiver input is greater than 100 microvolts and less than 1 volt.

(ii) In the absence of interference of any kind, it shall be actuated by either three or four consecutive dashes when the dashes vary in length from 3·5 to as near 6 seconds as possible and the spaces vary in length between 1·5 seconds and the lowest practicable value, preferably not greater than 10 milliseconds.

(iii) It shall not be actuated by atmospherics or by any signal other than the radiotelegraph alarm signal, provided that the received signals do not in fact constitute a signal falling within the tolerance limits indicated in (ii).

(iv) The selectivity of the radiotelegraph auto alarm shall be such as to provide a practically uniform sensitivity over a band extending not less than 4 kc/s and not more than 8 kc/s on each side of the radiotelegraph distress frequency and to provide outside this band a sensitivity which decreases as rapidly as possible in conformity which the best engineering practice.
(v) If practicable, the radiotelegraph auto alarm shall, in the presence of atmospherics or interfering signals, automatically adjust itself so that within a reasonably short time it approaches the condition in which it can most readily distinguish the radiotelegraph alarm signal.

(vi) When actuated by a radiotelegraph alarm signal, or in the event of failure of the apparatus, the radiotelegraph auto alarm shall cause a continuous audible warning to be given in the radiotelegraph operating room, in the radio officer's sleeping accommodation and on the bridge. If practicable, warning shall also be given in the case of failure of any part of the whole alarm receiving system. Only one switch for stopping the warning shall be provided and this shall be situated in the radiotelegraph operating room.

(vii) For the purpose of regularly testing the radiotelegraph auto alarm, the apparatus shall include a generator pre-tuned to the radiotelegraph distress frequency and a keying device by means of which a radiotelegraph alarm signal of the minimum strength indicated in (i) is produced. A means shall also be provided for attaching headphones for the purpose of listening to signals received on the radiotelegraph auto alarm.

(viii) The radiotelegraph auto alarm shall be capable of withstanding vibration, humidity and changes of temperature, equivalent to severe conditions experienced on board ships at sea, and shall continue to operate under such conditions.

(b) Before a new type of radiotelegraph auto alarm is approved, the Administration concerned shall be satisfied, by practical tests made under operating conditions equivalent to those obtaining in practice, that the apparatus complies with paragraph (a) of this Regulation.

(c) In ships fitted with a radiotelegraph auto alarm, its efficiency shall be tested by a radio officer at least once every 24 hours while at sea. If it is not in working order, the radio officer shall report that fact to the master or officer on watch on the bridge.

(d) A radio officer shall periodically check the proper functioning of the radiotelegraph auto alarm receiver, with its normal aerial connected, by listening to signals and by comparing them with similar signals received on the radiotelegraph distress frequency on the main installation.

(e) As far as practicable, the radiotelegraph auto alarm, when connected to an aerial, shall not affect the accuracy of the direction-finder.

(f) Radiotelegraph auto alarms which do not comply with the requirements of paragraph (a) of this Regulation shall be replaced by radiotelegraph auto alarms which do so comply within four years from the date of coming into force of the present Convention.
Regulation 11

DIRECTION-FINDERS

(a) The direction-finding apparatus required by Regulation 12 of Chapter V shall be efficient and capable of receiving signals with the minimum of receiver noise and of taking bearings from which the true bearing and direction may be determined.

(b) It shall be capable of receiving signals on the radiotelegraph frequencies assigned by the Radio Regulations for the purposes of distress and direction-finding and for maritime radio beacons.

(c) In the absence of interference the direction-finding apparatus shall have a sensitivity sufficient to permit accurate bearings being taken on a signal having a field strength as low as 50 microvolts per metre.

(d) As far as is practicable, the direction-finding apparatus shall be so located that as little interference as possible from mechanical or other noise will be caused to the efficient determination of bearings.

(e) As far as is practicable, the direction-finding aerial system shall be erected in such a manner that the efficient determination of bearings will be hindered as little as possible by the close proximity of other aerials, derricks, wire halyards or other large metal objects.

(f) An efficient two-way means of calling and voice communication shall be provided between the direction-finder and the bridge.

(g) All direction-finders shall be calibrated to the satisfaction of the Administration on first installation. The calibration shall be verified by check bearings or by a further calibration whenever any changes are made in the position of any aerials or of any structures on deck which might affect appreciably the accuracy of the direction-finder. The calibration particulars shall be checked at yearly intervals, or as near thereto as possible. A record shall be kept of the calibrations and of any checks made of their accuracy.

Regulation 12

RADIOTELEGRAPH INSTALLATION FOR FITTING IN MOTOR LIFEBOATS

(a) The radiotelegraph installation required by Regulation 14 of Chapter III shall include a transmitter, a receiver and a source of energy. It shall be so designed that it can be used in an emergency by an unskilled person.

(b) The transmitter shall be capable of transmitting on the radiotelegraph distress frequency using a class of emission assigned by the Radio Regulations for that frequency. The transmitter shall also be capable of transmitting on the frequency, and of using a class of emission, assigned by the Radio Regulations for use by survival craft in the bands between 4,000 kc/s and 27,500 kc/s.

(c) The transmitter shall, if modulated emission is prescribed by the Radio Regulations, have a depth of modulation of not less than 70 per cent. and a note frequency between 450 and 1,350 cycles per second.
(d) In addition to a key for manual transmissions, the transmitter shall be fitted with an automatic keying device for the transmission of the radiotelegraph alarm and distress signals.

(e) On the radiotelegraph distress frequency the transmitter shall have a minimum normal range (as specified in paragraph (g) of Regulation 9 of this Chapter) of 25 miles using the fixed aerial.*

(f) The receiver shall be capable of receiving the radiotelegraph distress frequency and the classes of emission assigned by the Radio Regulations for that frequency.

(g) The source of energy shall consist of an accumulator battery with sufficient capacity to supply the transmitter for four hours continuously under normal working conditions. If the battery is of a type that requires charging, means shall be available for charging it from the ship’s power supply. In addition there shall be a means for charging it after the lifeboat has been launched.

(h) When the power for the radiotelegraph installation and the searchlight required by Regulation 14 of Chapter III are drawn from the same battery, it shall have sufficient capacity to provide for the additional load of the searchlight.

(i) A fixed-type aerial shall be provided together with means for supporting it at the maximum practicable height. In addition an aerial supported by a kite or balloon shall be provided if practicable.

(j) At sea a radio officer shall at weekly intervals test the transmitter using a suitable artificial aerial, and shall bring the battery up to full charge if it is of a type which requires charging.

Regulation 13

PORTABLE RADIO APPARATUS FOR SURVIVAL CRAFT

(a) The apparatus required by Regulation 13 of Chapter III shall include a transmitter, a receiver, an aerial and a source of energy. It shall be so designed that it can be used in an emergency by an unskilled person.

(b) The apparatus shall be readily portable, watertight, capable of floating in sea water and capable of being dropped into the sea without damage. New equipment shall be as light-weight and compact as practicable and shall preferably be capable of use in both lifeboats and liferafts.

(c) The transmitter shall be capable of transmitting on the radiotelegraph distress frequency using a class of emission assigned by the Radio Regulations for the frequency,

* In the absence of a measurement of the field strength, it may be assumed that this range will be obtained if the product of the height of the aerial above the water line and the aerial current (R.M.S. value) is 10 metre-amperes.
and, in the bands between 4,000 kc/s and 27,500 kc/s, of transmitting on that radiotelegraph frequency, and of using a class of emission, assigned by the Radio Regulations for survival craft. However, the Administration may permit the transmitter to be capable of transmitting on the radiotelephone distress frequency, and of using the class of emission, assigned by the Radio Regulations for that frequency, as an alternative or in addition to transmission on the radiotelegraph frequency assigned by the Radio Regulations for survival craft in the bands between 4,000 kc/s and 27,500 kc/s.

(d) The transmitter shall, if modulated emission is prescribed by the Radio Regulations, have a depth of modulation of not less than 70 per cent, and in the case of radiotelegraph emission have a note frequency between 450 and 1,350 cycles per second.

(e) In addition to a key for manual transmissions, the transmitter shall be fitted with an automatic keying device for the transmission of the radiotelegraph alarm and distress signals. If the transmitter is capable of transmitting on the radiotelephone distress frequency, it shall be fitted with an automatic device, complying with the requirements of paragraph (e) of Regulation 15 of this Chapter, for transmitting the radiotelephone alarm signal.

(f) The receiver shall be capable of receiving the radiotelegraph distress frequency and the classes of emission assigned by the Radio Regulations for that frequency. If the transmitter is capable of transmitting on the radiotelephone distress frequency the receiver shall also be capable of receiving that frequency and the class of emission assigned by the Radio Regulations for that frequency.

(g) The aerial shall be either self-supporting or capable of being supported by the mast of a lifeboat at the maximum practicable height. In addition it is desirable that an aerial supported by a kite or balloon shall be provided if practicable.

(h) The transmitter shall supply an adequate radio frequency power* to the aerial required by paragraph (a) of this Regulation and shall preferably derive its supply from a hand generator. If operated from a battery, the battery shall comply with conditions laid down by the Administration to ensure that it is of a durable type and is of adequate capacity.

(i) At sea a radio officer or a radiotelephone operator, as appropriate, shall at weekly intervals test the transmitter, using a suitable artificial aerial, and shall bring the battery up to full charge if it is of a type which requires charging.

(j) For the purpose of this Regulation, new equipment means equipment supplied to a ship after the date of coming into force of the present Convention.

* It may be assumed that the purpose of this Regulation will be satisfied by the following performance.

At least 10 watts input to the anode of the final stage or a radio-frequency output of at least 2-0 watts (A2 emission) at 500 kc/s into an artificial aerial having an effective resistance of 15 ohms and 100 × 10⁻¹¹ farads capacitance in series. The depth of modulation shall be at least 70 per cent.
Regulation 14

Radio telephone stations

(a) The radiotelephone station shall be in the upper part of the ship and so located that it is sheltered to the greatest possible extent from noise which might impair the correct reception of messages and signals.

(b) There shall be efficient communication between the radiotelephone station and the bridge.

(c) A reliable clock shall be securely mounted in such a position that the entire dial can be easily observed from the radiotelephone operating position.

(d) A reliable emergency light shall be provided, independent of the system which supplies the normal lighting of the radiotelephone installation, and permanently arranged so as to be capable of providing adequate illumination of the operating controls of the radiotelephone installation, of the clock required by paragraph (c) of this Regulation and of the card of instructions required by paragraph (f).

(e) Where a source of energy consists of a battery or batteries, the radiotelephone station shall be provided with a means of assessing the charge condition.

(f) A card of instructions giving a clear summary of the radiotelephone distress procedure shall be displayed in full view of the radiotelephone operating position.

Regulation 15

Radio telephone installations

(a) The radiotelephone installation shall include a transmitter, a receiver and a source of energy.

(b) The transmitter shall be capable of transmitting on the radiotelephone distress frequency and on at least one other frequency in the bands between 1,605 kc/s and 2,850 kc/s, using the class of emission assigned by the Radio Regulations for these frequencies. In normal operation the transmitter shall have a depth of modulation of at least 70 per cent. at peak intensity.

(c) (i) In the case of cargo ships of 500 tons gross tonnage and upwards but less than 1,600 tons gross tonnage the transmitter shall have a minimum normal range of 150 miles, i.e., it shall be capable of transmitting clearly perceptible signals from ship to ship by day and under normal conditions and circumstances over this range.* (Clearly perceptible signals will normally be received if the R.M.S. value of the field strength produced at the receiver by the unmodulated carrier is at least 25 microvolts per metre):

(ii) In the case of cargo ships of 300 tons gross tonnage and upwards but less than 500 tons gross tonnage—

* In the absence of field strength measurements, it may be assumed that this range will be obtained by a power in the aerial (of 15 watts unmodulated carrier) with an aerial efficiency of 27 per cent.
for existing installations the transmitter shall have a minimum normal range of at least 75 miles;
for new installations the transmitter shall produce a power in the aerial of at least 15 watts (unmodulated carrier).

(d) The transmitter shall be fitted with a device for generating the radiotelephone alarm signal by automatic means. The device shall be capable of being taken out of operation at any time in order to permit the immediate transmission of a distress message. The Administration may delay the application of the requirement for the device in the case of existing installations for a period not exceeding three years from the date of coming into force of the present Convention.

(e) The device required by paragraph (d) of this Regulation shall comply with the following requirements:

(i) The tolerance of the frequency of each tone shall be ±1.5 per cent.;

(ii) The tolerance on the duration of each tone shall be ±50 milliseconds;

(iii) The interval between successive tones shall not exceed 50 milliseconds;

(iv) The ratio of the amplitude of the stronger tone to that of the weaker shall be within the range 1 to 1.2.

(f) The receiver required by paragraph (a) of this Regulation shall be capable of receiving the radiotelephone distress frequency and at least one other frequency available for maritime radiotelephone stations in the bands between 1,605 kc/s and 2,850 kc/s, using the class of emission assigned by the Radio Regulations for these frequencies. In addition the receiver shall permit the reception of such other frequencies, using the class of emission assigned by the Radio Regulations, as are used for the transmission by radiotelephony of meteorological messages and such other communications relating to the safety of navigation as may be considered necessary by the Administration. The receiver shall have sufficient sensitivity to produce signals by means of a loudspeaker when the receiver input is as low as 50 microvolts.

(g) The receiver used for maintaining watch on the radiotelephone distress frequency shall be preset to this frequency, or so arranged that setting to the frequency may be carried out in a rapid and precise manner and that, when set to this frequency, the receiver shall not easily be detuned accidentally. The Administration may delay the application of the requirements of this paragraph in the case of existing installations for a period not exceeding three years from the date of coming into force of the present Convention.

(h) To permit rapid change-over from transmission to reception when manual switching is used, the control for the switching device shall, where practicable, be located on the microphone or the telephone handset.

(i) While the ship is at sea, there shall be available at all times a main source of energy sufficient to operate the installation over the normal range required by paragraph
(c) of this Regulation. If batteries are provided they shall under all circumstances have sufficient capacity to operate the transmitter and receiver for at least six hours continuously under normal working conditions.* In installations in cargo ships of 500 tons gross tonnage and upwards but less than 1,600 tons gross tonnage made on or after 19 November 1952, a reserve source of energy shall be provided in the upper part of the ship unless the main source of energy is so situated.

(j) The reserve source of energy, if provided, may be used only to supply
(i) the radiotelephone installation;
(ii) the emergency light required by paragraph (d) of Regulation 14 of this Chapter; and
(iii) the device required by paragraph (d) of this Regulation, for generating the radiotelephone alarm signal.

(k) Notwithstanding the provisions of paragraph (j) of this Regulation, the Administration may authorise the use of the reserve source of energy, if provided, for a direction-finder, if fitted, and for a number of low-power emergency circuits which are wholly confined to the upper part of the ship, such as emergency lighting on the boat deck, on condition that the additional loads can be readily disconnected, and that the source of energy is of sufficient capacity to carry them.

(l) While at sea, any battery provided shall be kept charged so as to meet the requirements of paragraph (i) of this Regulation.

(m) An aerial shall be provided and installed and, if suspended between supports liable to whipping, shall in the case of ships of 500 tons gross tonnage and upwards but less than 1,600 tons gross tonnage be protected against breakage. In addition, there shall be a spare aerial completely assembled for immediate replacement or, where this is not practicable, sufficient aerial wire and insulators to enable a spare aerial to be erected. The necessary tools to erect an aerial shall also be provided.

Part D

RADIO LOGS

Regulation 16

Radio Logs

(a) The radio log (diary of the radio service) required by the Radio Regulations for a ship which is fitted with a radiotelegraph station in accordance with Regulation 3 or

* For the purpose of determining the electrical load to be supplied by batteries required to have six hours reserve capacity, the following formula is recommended as a guide:

\[
\text{current consumption of the current consumption necessary for speech transmission} \\
\text{current consumption of receiver} \\
\text{current consumption of all additional loads to which the batteries may supply energy in time of distress or emergency.}
\]

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Regulation 4 of this Chapter shall be kept in the radiotelegraph operating room during the voyage. Every radio officer shall enter in the log his name, the times at which he goes on and off watch, and all incidents connected with the radio service which occur during his watch which may appear to be of importance to safety of life at sea. In addition, there shall be entered in the log:

(i) the entries required by the Radio Regulations;
(ii) details of the maintenance, including a record of the charging, of the batteries, in such form as may be prescribed by the Administration;
(iii) a daily statement that the requirement of paragraph (\(p\)) of Regulation 9 of this Chapter has been fulfilled;
(iv) details of the tests of the reserve transmitter and reserve source of energy made under paragraph (s) of Regulation 9 of this Chapter;
(v) in ships fitted with a radiotelegraph auto alarm details of tests made under paragraph (c) of Regulation 10 of this Chapter;
(vi) details of the maintenance of the batteries, including a record of the charging (if applicable) required by paragraph (j) of Regulation 12 of this Chapter, and details of the tests required by that paragraph in respect of the transmitters fitted in motor lifeboats;
(vii) details of the maintenance of the batteries, including a record of the charging (if applicable) required by paragraph (i) of Regulation 13 of this Chapter, and details of the tests required by that paragraph in respect of portable radio apparatus for survival craft.

(b) The radio log (diary of the radio service) required by the Radio Regulations for a ship which is fitted with a radiotelephone station in accordance with Regulation 4 of this Chapter shall be kept at the place where listening watch is maintained. Every qualified operator, and every master, officer or crew member carrying out a listening watch in accordance with Regulation 7 of this Chapter, shall enter in the log, with his name, the details of all incidents connected with the radio service which occur during his watch which may appear to be of importance to safety of life at sea. In addition, there shall be entered in the log:

(i) the details required by the Radio Regulations;
(ii) the time at which listening watch begins when the ship leaves port, and the time at which it ends when the ship reaches port;
(iii) the time at which listening watch is for any reason discontinued, together with the reason, and the time at which listening watch is resumed;
(iv) details of the maintenance of the batteries (if provided), including a record of the charging required by paragraph (l) of Regulation 15 of this Chapter;
(v) details of the maintenance of the batteries, including a record of the charging (if applicable) required by paragraph (i) of Regulation 13 of this Chapter, and details of the tests required by that paragraph in respect of portable radio apparatus for survival craft.

(c) Radio logs shall be available for inspection by the officers authorised by the Administration to make such inspection.
CHAPTER V

SAFETY OF NAVIGATION

Regulation 1

APPLICATION

This Chapter, unless otherwise expressly provided in this Chapter, applies to all ships on all voyages, except ships of war and ships solely navigating the Great Lakes of North America and their connecting and tributary waters as far east as the lower exit of the St. Lambert Lock at Montreal in the Province of Quebec, Canada.

Regulation 2

DANGER MESSAGES

(a) The master of every ship which meets with dangerous ice, a dangerous derelict, or any other direct danger to navigation, or a tropical storm, or encounters sub-freezing air temperatures associated with gale force winds causing severe ice accretion on superstructures, or winds of force 10 or above on the Beaufort scale for which no storm warning has been received, is bound to communicate the information by all the means at his disposal to ships in the vicinity, and also to the competent authorities at the first point on the coast with which he can communicate. The form in which the information is sent is not obligatory. It may be transmitted either in plain language (preferably English) or by means of the International Code of Signals. It should be broadcast to all ships in the vicinity and sent to the first point on the coast to which communication can be made, with a request that it be transmitted to the appropriate authorities.

(b) Each Contracting Government will take all steps necessary to ensure that when intelligence of any of the dangers specified in paragraph (a) is received, it will be promptly brought to the knowledge of those concerned and communicated to other interested Governments.

(c) The transmission of messages respecting the dangers specified is free of cost to the ships concerned.

(d) All radio messages issued under paragraph (a) of this Regulation shall be preceded by the Safety Signal, using the procedure as prescribed by the Radio Regulations as defined in Regulation 2 of Chapter IV.

Regulation 3

INFORMATION REQUIRED IN DANGER MESSAGES

The following information is required in danger messages:

(a) Ice, Derelicts and other Direct Dangers to Navigation.
(i) The kind of ice, derelict or danger observed;
(ii) the position of the ice, derelict or danger when last observed;
(iii) the time and date (Greenwich Mean Time) when danger last observed.

(b) Tropical Storms (Hurricanes in the West Indies, Typhoons in the China Sea, Cyclones in Indian waters, and storms of a similar nature in other regions).

(i) A statement that a tropical storm has been encountered. This obligation should be interpreted in a broad spirit, and information transmitted whenever the master has good reason to believe that a tropical storm is developing or exists in his neighbourhood.

(ii) Time, date (Greenwich Mean Time) and position of ship when the observation was taken.

(iii) As much of the following information as is practicable should be included in the message:
   —barometric pressure, preferably corrected (stating millibars, inches, or millimetres, and whether corrected or uncorrected);
   —barometric tendency (the change in barometric pressure during the past three hours);
   —true wind direction;
   —wind force (Beaufort scale);
   —state of the sea (smooth, moderate, rough, high);
   —swell (slight, moderate, heavy) and the true direction from which it comes. Period or length of swell (short, average, long) would also be of value;
   —true course and speed of ship.

(c) Subsequent Observations. When a master has reported a tropical or other dangerous storm, it is desirable, but not obligatory, that further observations be made and transmitted hourly, if practicable, but in any case at intervals of not more than three hours, so long as the ship remains under the influence of the storm.

(d) Winds of force 10 or above on the Beaufort scale for which no storm warning has been received.

This is intended to deal with storms other than the tropical storms referred to in paragraph (b); when such a storm is encountered, the message should contain similar information to that listed under paragraph (b) but excluding the details concerning sea and swell.

(e) Sub-freezing air temperatures associated with gale force winds causing severe ice accretion on superstructures.

(i) Time and Date (Greenwich Mean Time).
(ii) Air temperature.
(iii) Sea temperature (if practicable).
(iv) Wind force and direction.
Examples

Ice

TTT Ice. Large berg sighted in 4605 N., 4410 W., at 0800 GMT. May 15.

Derelicts

TTT Derelict. Observed derelict almost submerged in 4006 N., 1243 W., at 1630 GMT. April 21.

Danger to Navigation


Tropical Storm

TTT Storm. 0030 GMT. August 18. 2204 N., 11354 E. Barometer corrected 994 millibars, tendency down 6 millibars. Wind NW., force 9, heavy squalls. Heavy easterly swell. Course 067, 5 knots.

TTT Storm. Appearances indicate approach of hurricane. 1300 GMT. September 14. 2200 N., 7236 W. Barometer corrected 29.64 inches, tendency down .015 inches. Wind NE., force 8, frequent rain squalls. Course 035, 9 knots.

TTT Storm. Conditions indicate intense cyclone has formed. 0200 GMT. May 4. 1620 N., 9203 E. Barometer uncorrected 753 millimetres, tendency down 5 millimetres. Wind S. by W., force 5. Course 300, 8 knots.

TTT Storm. Typhoon to southeast. 0300 GMT. June 12. 1812 N., 12305 E. Barometer falling rapidly. Wind increasing from N.

TTT Storm. Wind force 11, no storm warning received. 0300 GMT. May 4. 4830 N., 30 W. Barometer corrected 983 millibars, tendency down 4 millibars. Wind SW., force 11 veering. Course 260, 6 knots.

Icing


Regulation 4

Meteorological Services

(a) The Contracting Governments undertake to encourage the collection of meteorological data by ships at sea and to arrange for their examination, dissemination and exchange in the manner most suitable for the purpose of aiding navigation. Administrations shall encourage the use of instruments of a high degree of accuracy, and shall facilitate the checking of such instruments upon request.

(b) In particular, the Contracting Governments undertake to co-operate in carrying out, as far as practicable, the following meteorological arrangements:

(i) To warn ships of gales, storms and tropical storms, both by the issue of radio messages and by the display of appropriate signals at coastal points.
(ii) To issue daily, by radio, weather bulletins suitable for shipping, containing data of existing weather, waves and ice, forecasts and, when practicable, sufficient additional information to enable simple weather charts to be prepared at sea and also to encourage the transmission of suitable facsimile weather charts.

(iii) To prepare and issue such publications as may be necessary for the efficient conduct of meteorological work at sea and to arrange, if practicable, for the publication and making available of daily weather charts for the information of departing ships.

(iv) To arrange for selected ships to be equipped with tested instruments (such as a barometer, a barograph, a psychrometer, and suitable apparatus for measuring sea temperature) for use in this service, and to take meteorological observations at main standard times for surface synoptic observations (at least four times daily, whenever circumstances permit) and to encourage other ships to take observations in a modified form, particularly when in areas where shipping is sparse; these ships to transmit their observations by radio for the benefit of the various official meteorological services, repeating the information for the benefit of ships in the vicinity. When in the vicinity of a tropical storm, or of a suspected tropical storm, ships should be encouraged to take and transmit their observations at more frequent intervals whenever practicable, bearing in mind navigational preoccupations of ships' officers during storm conditions.

(v) To arrange for the reception and transmission by coast radio stations of weather messages from and to ships. Ships which are unable to communicate direct with shore shall be encouraged to relay their weather messages through ocean weather ships or through other ships which are in contact with shore.

(vi) To encourage all masters to inform ships in the vicinity and also shore stations whenever they experience a wind speed of 50 knots or more (force 10 on the Beaufort scale).

(vii) To endeavour to obtain a uniform procedure in regard to the international meteorological services already specified, and, as far as is practicable, to conform to the Technical Regulations and recommendations made by the World Meteorological Organization, to which the Contracting Governments may refer for study and advice any meteorological question which may arise in carrying out the present Convention.

(c) The information provided for in this Regulation shall be furnished in form for transmission and transmitted in the order of priority prescribed by the Radio Regulations, and during transmission "to all stations" of meteorological information, forecasts and warnings, all ship stations must conform to the provisions of the Radio Regulations.
(d) Forecasts, warnings, synoptic and other meteorological reports intended for ships shall be issued and disseminated by the national service in the best position to serve various zones and areas, in accordance with mutual arrangements made by the Contracting Governments concerned.

**Regulation 5**

**ICE PATROL SERVICE**

(a) The Contracting Governments undertake to continue an ice patrol and a service for study and observation of ice conditions in the North Atlantic. During the whole of the ice season the south-eastern, southern and south-western limits of the regions of icebergs in the vicinity of the Grand Banks of Newfoundland shall be guarded for the purpose of informing passing ships of the extent of this dangerous region; for the study of ice conditions in general; and for the purpose of affording assistance to ships and crews requiring aid within the limits of operation of the patrol ships. During the rest of the year the study and observation of ice conditions shall be maintained as advisable.

(b) Ships and aircraft used for the ice patrol service and the study and observation of ice conditions may be assigned other duties by the managing Government, provided that such other duties do not interfere with their primary purpose or increase the cost of this service.

**Regulation 6**

**ICE PATROL. MANAGEMENT AND COST**

(a) The Government of the United States of America agrees to continue the management of the ice patrol service and the study and observation of ice conditions, including the dissemination of information received therefrom. The Contracting Governments specially interested in these services undertake to contribute to the expense of maintaining and operating these services; each contribution to be based upon the total gross tonnage of the vessels of each contributing Government passing through the regions of icebergs guarded by the Ice Patrol; in particular, each Contracting Government specially interested undertakes to contribute annually to the expense of maintaining and operating these services a sum determined by the ratio which the total gross tonnage of that Contracting Government’s vessels passing during the ice season through the regions of icebergs guarded by the Ice Patrol bears to the combined total gross tonnage of the vessels of all contributing Governments passing during the ice season through the regions of icebergs guarded by the Ice Patrol. Non-contracting Governments specially interested may contribute to the expense of maintaining and operating these services on the same basis. The managing Government will furnish annually to each contributing Government a statement of the total cost of maintaining and operating the Ice Patrol and of the proportionate share of each contributing Government.

(b) Each of the contributing Governments has the right to alter or discontinue its contribution, and other interested Governments may undertake to contribute to the
expense. The contributing Government which avails itself of this right will continue responsible for its current contribution up to the 1 September following the date of giving notice of intention to alter or discontinue its contribution. To take advantage of the said right it must give notice to the managing Government at least six months before the said 1 September.

(c) If, at any time, the United States Government should desire to discontinue these services, or if one of the contributing Governments should express a wish to relinquish responsibility for its pecuniary contribution, or to have its contribution altered, or another Contracting Government should desire to undertake to contribute to the expense, the contributing Governments shall settle the question in accordance with their mutual interests.

(d) The contributing Governments shall have the right by common consent to make from time to time such alterations in the provisions of this Regulation and of Regulation 5 of this Chapter as appear desirable.

(e) Where this Regulation provides that a measure may be taken after agreement among the contributing Governments, proposals made by any Contracting Government for effecting such a measure shall be communicated to the managing Government which shall approach the other contributing Governments with a view to ascertaining whether they accept such proposals, and the results of the enquiries thus made shall be sent to the other contributing Governments and the Contracting Government making the proposals. In particular, the arrangements relating to contributions to the cost of the services shall be reviewed by the contributing Governments at intervals not exceeding three years. The managing Government shall initiate the action necessary to this end.

Regulation 7

SPEED NEAR ICE

When ice is reported on or near his course the master of every ship at night is bound to proceed at a moderate speed or to alter his course so as to go well clear of the danger zone.

Regulation 8

NORTH ATLANTIC ROUTES

(a) The practice of following recognised routes across the North Atlantic in both directions and, in particular, routes in converging areas of both sides of the North Atlantic, has contributed to the avoidance of collisions between ships and with icebergs, and should be recommended to all ships concerned.

(b) The selection of the routes and the initiation of action with regard to them, and the delineation of what constitutes converging areas, is left to the responsibility of the shipping companies concerned. The Contracting Governments will assist the companies, when requested to do so, by placing at their disposal any information bearing on the routes which may be in the possession of the Governments.
(c) The Contracting Governments undertake to impose on the companies the obligations to give public notice of the regular routes which they propose their ships should follow, and of any changes made in these routes. They will also use their influence to induce the owners of all passenger ships crossing the Atlantic to follow the recognised routes, and will do everything in their power to ensure adherence to such routes in the converging areas by all ships, so far as circumstances will permit. They will also induce the owners of all ships crossing the Atlantic bound to or from ports of the United States or Canada via the vicinity of the Grand Banks of Newfoundland to avoid, as far as practicable, the fishing banks of Newfoundland north of latitude 43°N. during the fishing season, and to pass outside regions known or believed to be endangered by ice.

(d) The Government managing the ice patrol service is requested to report to the Administration concerned any passenger ship which is observed not to be on any regular, recognised or advertised route and any ship which crosses the above mentioned fishing banks during the fishing season, or which when proceeding to or from ports of the United States or Canada passes through regions known or believed to be endangered by ice.

Regulation 9

MISUSE OF DISTRESS SIGNALS

The use of an international distress signal, except for the purpose of indicating that a ship or aircraft is in distress, and the use of any signal which may be confused with an international distress signal, are prohibited on every ship or aircraft.

Regulation 10

DISTRESS MESSAGES—OBLIGATIONS AND PROCEDURES

(a) The master of a ship at sea, on receiving a signal from any source that a ship or aircraft or survival craft thereof is in distress, is bound to proceed with all speed to the assistance of the persons in distress informing them if possible that he is doing so. If he is unable or, in the special circumstances of the case, considers it unreasonable or unnecessary to proceed to their assistance, he must enter in the log book the reason for failing to proceed to the assistance of the persons in distress.

(b) The master of a ship in distress, after consultation, so far as may be possible, with the masters of the ships which answer his call for assistance, has the right to requisition such one or more of those ships as he considers best able to render assistance, and it shall be the duty of the master or masters of the ship or ships requisitioned to comply with the requisition by continuing to proceed with all speed to the assistance of persons in distress.

(c) The master of a ship shall be released from the obligation imposed by paragraph (a) of this Regulation when he learns that one or more ships other than his own have been requisitioned and are complying with the requisition.
(d) The master of a ship shall be released from the obligation imposed by paragraph (a) of this Regulation, and, if his ship has been requisitioned, from the obligation imposed by paragraph (b) of this Regulation, if he is informed by the persons in distress or by the master of another ship which has reached such persons that assistance is no longer necessary.

(e) The provisions of this Regulation do not prejudice the International Convention for the unification of certain rules with regard to Assistance and Salvage at Sea, signed at Brussels on the 23rd September, 1910, particularly the obligation to render assistance imposed by Article 11 of that Convention.

Regulation 11
SIGNALLING LAMPS

All ships of over 150 tons gross tonnage, when engaged on international voyages, shall have on board an efficient daylight signalling lamp which shall not be solely dependent upon the ship's main source of electrical power.

Regulation 12
RADIO DIRECTION-FINDING APPARATUS

(a) All ships of 1,600 tons gross tonnage and upwards, when engaged on international voyages, shall be fitted with radio direction-finding apparatus complying with the provisions of Regulation 11 of Chapter IV.

(b) The Administration may, in areas where it considers it unreasonable or unnecessary for such apparatus to be carried, exempt any ship under 5,000 tons gross tonnage from this requirement, due regard being had to the fact that radio direction-finding apparatus is of value both as a navigational instrument and as an aid to locating ships, aircraft or survival craft.

Regulation 13
MANNING

The Contracting Governments undertake, each for its national ships, to maintain, or, if it is necessary, to adopt, measures for the purpose of ensuring that, from the point of view of safety of life at sea, all ships shall be sufficiently and efficiently manned.

Regulation 14
AIDS TO NAVIGATION

The Contracting Governments undertake to arrange for the establishment and maintenance of such aids to navigation, including radio beacons and electronic aids as, in

1 British and Foreign State Papers, Vol. 103, p. 434.
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their opinion, the volume of traffic justifies and the degree of risk requires, and to arrange for information relating to these aids to be made available to all concerned.

Regulation 15
SEARCH AND RESCUE

(a) Each Contracting Government undertakes to ensure that any necessary arrangements are made for coast watching and for the rescue of persons in distress at sea round its coasts. These arrangements should include the establishment, operation and maintenance of such maritime safety facilities as are deemed practicable and necessary having regard to the density of the seagoing traffic and the navigational dangers and should, so far as possible, afford adequate means of locating and rescuing such persons.

(b) Each Contracting Government undertakes to make available information concerning its existing rescue facilities and the plans for changes therein, if any.

Regulation 16
LIFE-SAVING SIGNALS

The following signals shall be used by life-saving stations and maritime rescue units when communicating with ships or persons in distress and by ships or persons in distress when communicating with life-saving stations and maritime rescue units. The signals used by aircraft engaged in search and rescue operations to direct ships are indicated in sub-paragraph (d) below. An illustrated table describing the signals listed below shall be readily available to the officer of the watch of every ship to which this Chapter applies.

(a) Replies from life-saving stations or maritime rescue units to distress signals made by a ship or person:

<table>
<thead>
<tr>
<th>Signal</th>
<th>Signification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>By day</strong>—Orange smoke signal or combined light and sound signal (thunderlight) consisting of three single signals which are fired at intervals of approximately one minute.</td>
<td>“You are seen—assistance will be given as soon as possible.”</td>
</tr>
<tr>
<td><strong>By night</strong>—White star rocket consisting of three single signals which are fired at intervals of approximately one minute.</td>
<td>(Repetition of such signals shall have the same meaning.)</td>
</tr>
</tbody>
</table>

If necessary the day signals may be given at night or the night signals by day.
(b) Landing signals for the guidance of small boats with crews or persons in distress:

<table>
<thead>
<tr>
<th>Signal</th>
<th>Signification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>By day</strong>—Vertical motion of a white flag or the arms or firing of a green star-signal or signalling the code letter “K” (—•—) given by light or sound-signal apparatus.</td>
<td><strong>This is the best place to land.</strong></td>
</tr>
<tr>
<td><strong>By night</strong>—Vertical motion of a white light or flare, or firing of a green star-signal or signalling the code letter “K” (—•—) given by light or sound-signal apparatus. A range (indication of direction) may be given by placing a steady white light or flare at a lower level and in line with the observer.</td>
<td></td>
</tr>
</tbody>
</table>

*By day*—Horizontal motion of a white flag or arms extended horizontally or firing of a red star-signal or signalling the code letter “S” (•••) given by light or sound-signal apparatus.

*By night*—Horizontal motion of a white light or flare or firing of a red star-signal or signalling the code letter “S” (•••) given by light or sound-signal apparatus.

<table>
<thead>
<tr>
<th>Signal</th>
<th>Signification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>By day</strong>—Horizontal motion of a white flag, followed by the placing of the white flag in the ground and the carrying of another white flag in the direction to be indicated or firing of a red star-signal vertically and a white star-signal in the direction towards the better landing place or signalling the code letter “S” (•••) followed by the code letter “R” (•—•) if a better landing place for the craft in distress is located more to the right in the direction of approach or signalling the code letter “L” (•—••) if a better landing place for the craft in distress is located more to the left in the direction of approach.</td>
<td><strong>Landing here highly dangerous. A more favourable location for landing is in the direction indicated.</strong></td>
</tr>
<tr>
<td><strong>By night</strong>—Horizontal motion of a white light or flare, followed by the placing of the white light or flare on the ground and the carrying of another white light or flare in the direction to be indicated or firing of a red star-signal vertically and a white star-signal in the direction</td>
<td></td>
</tr>
</tbody>
</table>
Signal

towards the better landing place or signalling the code letter "S" (•••) followed by code letter "R" (•—•) if a better landing place for the craft in distress is located more to the right in the direction of approach or signalling the code letter "L" (•—••) if a better landing place for the craft in distress is located more to the left in the direction of approach.

Signification

"Landing here highly dangerous. A more favourable location for landing is in the direction indicated."

(c) Signals to be employed in connection with the use of shore life-saving apparatus:

Signal

By day—Vertical motion of a white flag or the arms or firing of a green star-signal.

By night—Vertical motion of a white light or flare or firing of a green star-signal.

<table>
<thead>
<tr>
<th>Signal</th>
<th>Signification</th>
</tr>
</thead>
<tbody>
<tr>
<td>In general—&quot;Affirmative.&quot;</td>
<td>&quot;Rocket line is held.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Tail block is made fast.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Hawser is made fast.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Man is in the breeches buoy.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Haul away.&quot;</td>
</tr>
</tbody>
</table>

By day—Horizontal motion of a white flag or arms extended horizontally or firing of a red star-signal.

By night—Horizontal motion of a white light or flare or firing of a red star-signal.

<table>
<thead>
<tr>
<th>Signal</th>
<th>Signification</th>
</tr>
</thead>
<tbody>
<tr>
<td>In general—&quot;Negative.&quot;</td>
<td>&quot;Slack away.&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;Avast hauling.&quot;</td>
</tr>
</tbody>
</table>

(d) Signals used by aircraft engaged on search and rescue operations to direct ships towards an aircraft, ship or person in distress (see explanatory Note below):

(i) The following procedures performed in sequence by an aircraft mean that the aircraft is directing a surface craft towards an aircraft or a surface craft in distress:

1. circling the surface craft at least once;
2. crossing the projected course of the surface craft close ahead at a low altitude, opening and closing the throttle or changing the propeller pitch;
3. heading in the direction in which the surface craft is to be directed.

Repetition of such procedures has the same meaning.

(ii) The following procedure performed by an aircraft means that the assistance of the surface craft to which the signal is directed is no longer required:

—crossing the wake of the surface craft close astern at a low altitude, opening and closing the throttle or changing the propeller pitch.

Note: Advance notification of changes in these signals will be given by the Organization as necessary.
Regulation 17

Pilot Ladders

Ships engaged on voyages in the course of which pilots are likely to be employed shall comply with the following requirements respecting pilot ladders:

(a) The ladder shall be kept in good order and for use only by officials and other persons while a ship is arriving at or leaving a port, and for embarkation and disembarkation of pilots.

(b) The ladder shall be secured in a position so that each step rests firmly against the ship's side and so that the pilot can gain safe and convenient access to the ship after climbing not less than 5 feet (or 1.5 metres) and not more than 30 feet (or 9 metres). A single length of ladder shall be used capable of reaching sea level in all normal conditions of trim of the ship. Whenever the distance from sea level to the point of access to the ship is more than 30 feet (or 9 metres), access from the pilot ladder to the ship shall be by means of an accommodation ladder or other equally safe and convenient means.

(c) The treads of the ladder shall be not less than 19 inches (or 48 centimetres) long, 4 1/2 inches (or 11.4 centimetres) wide and 1 inch (or 2.5 centimetres) in depth. Steps shall be joined in such a manner as will provide a ladder of adequate strength whose treads are maintained in a horizontal position and not less than 12 inches (or 30.5 centimetres) or more than 15 inches (or 38 centimetres) apart.

(d) A man-rope, properly secured, and a safety line shall be available and ready for use if required.

(e) Arrangements shall be such that:

(i) The rigging of the ladder and the embarkation and disembarkation of a pilot is supervised by a responsible officer of the ship.

(ii) Handholds are provided to assist the pilot to pass safely and conveniently from the head of the ladder into the ship or on to the ship's deck.

(f) If necessary spreaders shall be provided at such intervals as will prevent the ladder from twisting.

(g) At night a light shining overside shall be available and used and the deck at the position where the pilot boards the ship shall be adequately lit.

(h) Ships with rubbing bands or other ships whose construction makes it impossible to comply fully with the provision that the ladder shall be secured at a place where each step will rest firmly against the ship's side shall comply with this provision as closely as possible.

No. 7794
CHAPTER VI
CARRIAGE OF GRAIN

Regulation 1
APPLICATION

Unless expressly provided otherwise, this Chapter applies to the carriage of grain in all ships to which the present Regulations apply.

Regulation 2
DEFINITION

The term "grain" includes wheat, maize (corn), oats, rye, barley, rice, pulses and seeds.

Regulation 3
TRIMMING

Where grain is loaded in a ship, all necessary and reasonable precautions shall be taken to prevent the grain from shifting. If any hold or compartment is entirely filled with bulk grain, the grain shall be trimmed so as to fill all the spaces between the beams and in the wings and ends.

Regulation 4
STOWAGE OF FULL HOLDS AND COMPARTMENTS

Subject to the provisions of Regulation 6 of this Chapter, if any hold or compartment is entirely filled with bulk grain it shall be divided either by a longitudinal bulkhead or shifting boards in line with, or not more than 5 per cent. of the moulded breadth of the ship from, the centre line or by longitudinal bulkheads or shifting boards off the centre line of the ship provided that the distance between them shall not exceed 60 per cent. of the moulded breadth of the ship and that in the latter case trimming hatches of suitable size shall be provided in the wings at longitudinal intervals of not more than 25 feet (or 7.62 metres) with end trimming hatches placed not more than 12 feet (or 3.66 metres) from transverse bulkheads. In every case the longitudinal bulkheads or shifting boards shall be properly constructed and fitted grain-tight with proper fillings between the beams. In holds such longitudinal bulkheads or shifting boards shall extend downwards from the underside of the deck to a distance of at least one-third of the depth of the hold or 8 feet (or 2.44 metres) whichever is the greater. In compartments in 'tween decks and superstructures they shall extend from deck to deck. In all cases the longitudinal bulkheads or shifting boards shall extend to the top of the feeders of the hold or compartment in which they are situated.
Provided that in the case of ships loaded with bulk grain other than linseed in which a metacentric height (after correction for the free surface effects of liquids in tanks) is maintained throughout the voyage of not less than 12 inches (or 0.31 metres) in the case of one or two deck ships and not less than 14 inches (or 0.36 metres) in the case of other ships, longitudinal bulkheads or shifting boards need not be fitted:

(a) below and within 7 feet (or 2.13 metres) of a feeder, but only in way of a hatchway, if that feeder contains, or all the feeders collectively feeding a compartment contain, not less than 5 per cent. of the quantity of grain carried in the compartment which is fed;

(b) in feeders which meet the requirements of paragraph (a) of this Regulation and which have such dimensions that the free grain surface will remain within the feeders throughout the voyage after allowing for a sinkage of grain amounting to 2 per cent. of the volume of the compartment fed and a shift of the free grain surface to an angle of 12 degrees to the horizontal; in this case the possible effects of the above mentioned movement of the free grain surfaces within the feeders shall be taken into account in calculating the metacentric height given above;

(c) in way of the hatchway where the bulk grain beneath the hatchway is trimmed in the form of a saucer hard up to the deckhead beyond the hatchway and is topped off with bagged grain or other suitable bagged cargo extending to a height in the centre of the saucer of not less than 6 feet (or 1.83 metres) above the top of the bulk grain (measured below the deck line); the bagged grain or other suitable bagged cargo shall fill the hatchway and the saucer below and shall be stowed tightly against the deckhead, the longitudinal bulkheads, the hatchway beams and the hatchway side and end coamings.

Regulation 5

STOWAGE OF PARTLY FILLED HOLDS AND COMPARTMENTS

Subject to the provisions of Regulation 6 of this Chapter, if any hold or compartment is partly filled with bulk grain:

(a) it shall be divided by a longitudinal bulkhead or shifting boards, in line with, or not more than 5 per cent. of the moulded breadth of the ship from, the centre line or by longitudinal bulkheads or shifting boards off the centre line of the ship provided that the distance between them shall not exceed 60 per cent. of the moulded breadth of the ship. In every case the longitudinal bulkheads or shifting boards shall be properly constructed and shall extend from the bottom of the hold or deck, as the case may be, to a height of not less than 2 feet (or 0.61 metres) above the surface of the bulk grain.

Provided that, except in the case of holds partly filled with linseed in bulk, longitudinal bulkheads or shifting boards need not be fitted in way of the hatchway in the case of ships in which a metacentric height (after correction for the free surface effects of liquids in tanks) is maintained throughout the voyage of not less than 12 inches (or 0.31 metres) in the case of one or two deck ships and not less than 14 inches (or 0.36 metres) in the case of other ships;
(b) the bulk grain shall be levelled and topped off with bagged grain or other suitable cargo tightly stowed and extending to a height of not less than 4 feet (or 1.22 metres) above the top of the bulk grain within spaces divided by such a longitudinal bulkhead or shifting boards, and not less than 5 feet (or 1.52 metres) within spaces not so divided. The bagged grain or other suitable cargo shall be supported on suitable platforms laid over the whole surface of the bulk grain; such platforms shall consist of bearers spaced not more than 4 feet (or 1.22 metres) apart and 1 inch (or 25 millimetres) boards laid thereon spaced not more than 4 inches (or 0.10 metres) apart or of strong separation cloths with adequate overlapping.

Regulation 6

Exceptions to the Requirements for Longitudinal Bulkheads

The fitting of longitudinal bulkheads or shifting boards in accordance with the provisions of Regulations 4 and 5 of this Chapter shall not be required:

(a) in a lower hold (which term also includes the lower part of the hold of a single-deck ship) if the bulk grain therein does not exceed one-third of the capacity of the hold, or where such lower hold is divided by a shaft tunnel, one-half the capacity of that lower hold;

(b) in any space in a 'tween deck or superstructure provided that the wings are tightly stowed with bagged grain or other suitable cargo to a breadth on each side of not less than 20 per cent. of the breadth of the ship in way thereof; and

(c) in those parts of spaces where the maximum breadth of the deckhead within the said spaces does not exceed one-half of the moulded breadth of the ship.

Regulation 7

Feeders

(a) (i) Any hold or compartment which is entirely filled with bulk grain shall be fed by suitably placed and properly constructed feeders, except as otherwise provided in paragraph (c) of Regulation 4 and Regulations 8 and 12 of this Chapter so as to secure a free flow of grain from the feeder to all parts of that hold or compartment.

(ii) Each feeder shall contain not less than 2 per cent. of the quantity of grain carried in that part of the hold or compartment that it feeds except as otherwise provided for in paragraph (a) of Regulation 4 of this Chapter.

(b) When bulk grain is carried in deep tanks primarily constructed for the carriage of liquids to which paragraph (c) of Regulation 6 of this Chapter applies or that are divided by one or more permanent steel longitudinal divisions fitted grain-tight, feeders to the tanks may be omitted if the tanks and tank hatchways are completely filled and the hatch covers secured.
**Regulation 8**

**COMMON LOADING**

For the purpose of Regulations 4 and 7 of this Chapter lower holds and 'tween deck spaces over them may be loaded as one compartment under the following conditions:

(a) longitudinal bulkheads or shifting boards shall be fitted deck to deck in the 'tween deck of a ship having two decks; in all other cases the longitudinal bulkheads or shifting boards shall be fitted for the upper third of the total depth of the common spaces;

(b) in order to secure an adequate flow of grain all spaces shall comply with the requirements of Regulation 9 of this Chapter and openings shall be provided in the wings of the deck immediately below the uppermost deck forward and aft of the ends of the hatchways as necessary to provide in combination with the hatchways a maximum feeding distance of 8 feet (or 2.44 metres) measured in a fore and aft line.

**Regulation 9**

**TRIMMING AND BAGGING OF END SPACES**

When the distance, measured in a fore and aft line, from any part of a hold or compartment to the nearest feeder exceeds 25 feet (or 7.62 metres) the bulk grain in the end spaces beyond 25 feet (or 7.62 metres) from the nearest feeder shall be levelled off at a depth of at least 6 feet (or 1.83 metres) below the deck, and the end spaces filled with bagged grain built up on a suitable platform as required in paragraph (b) of Regulation 5 of this Chapter.

**Regulation 10**

**BULK GRAIN IN 'TWEEN DECKS AND SUPERSTRUCTURES**

Bulk grain shall not be carried above deck, in the 'tween deck of a two deck ship, or in the uppermost 'tween deck of a ship having more than two decks except under the following conditions:

(a) the bulk grain or other cargo shall be stowed so as to ensure maximum stability; in all cases either a metacentric height (after correction for the free surface effects of liquids in tanks) shall be maintained throughout the voyage of not less than 12 inches (or 0.31 metres) in the case of one or two deck ships and 14 inches (or 0.36 metres) in the case of other ships or, alternatively, the aggregate quantity of bulk grain or other cargo carried above deck, in the 'tween deck spaces of a two deck ship or in the uppermost 'tween deck spaces of a ship having more than two decks shall not exceed 28 per cent. by weight of the total cargo below the 'tween deck where the master is satisfied that the ship will have adequate stability throughout the voyage; the limitation of 28 per cent. specified above shall not apply when the grain carried above deck or in the uppermost 'tween deck spaces is oats, barley or cotton seed;
(b) the deck area of any portion of the spaces referred to in this Regulation which contains bulk grain and which is only partly filled shall not exceed 1,000 square feet (or 93 square metres); and

c) all spaces referred to in this Regulation in which bulk grain is stowed shall be subdivided by transverse bulkheads at intervals of not more than 100 feet (or 30-50 metres); when this distance is exceeded the excess space shall be entirely filled with bagged grain or other suitable cargo.

Regulation 11

Limitation on number of partly filled holds and compartments

Except in the case of ships in which a metacentric height (after correction for the free surface effects of liquids in tanks) is maintained throughout the voyage of not less than 12 inches (or 0.31 metres) in the case of one or two deck ships and not less than 14 inches (or 0.36 metres) in the case of other ships, not more than two holds or compartments shall be partly filled with bulk grain, except that other holds or compartments may be partly filled with bulk grain if they are filled up to the deckhead with bagged or other suitable cargo. For the purpose of this Regulation:

(a) superimposed 'tween decks shall be regarded as separate compartments and separate from any lower hold below them;

(b) feeders and the partly filled spaces referred to in paragraph (b) of Regulation 10 of this Chapter shall not be regarded as compartments; and

c) holds or compartments provided with one or more grain-tight longitudinal divisions shall be regarded as one hold or compartment.

Regulation 12

Stowage of specially suitable ships

(a) Notwithstanding anything contained in Regulations 4 to 11 of this Chapter, bulk grain may be carried without regard to the requirements specified therein in ships which are constructed with two or more vertical or sloping grain-tight longitudinal divisions suitably disposed to limit the effect of any transverse shift of grain under the following conditions:

(i) as many holds and compartments as possible shall be full and trimmed full;

(ii) for any specified arrangement of stowage the ship will not list to an angle greater than 5 degrees at any stage of the voyage where:

(1) in holds or compartments which have been trimmed full the grain surface settles 2 per cent. by volume from the original surface and shifts to an angle of 12 degrees with that surface under all boundaries of these holds and compartments which have an inclination of less than 30 degrees to the horizontal; and
(2) in partly filled holds or compartments free grain surfaces settle and shift as in sub-paragraph (ii) (1) in this paragraph or to such larger angle as may be deemed necessary by the Administration, or by a Contracting Government on behalf of the Administration, and grain surfaces if overstowed in accordance with Regulation 5 of this Chapter shift to an angle of 8 degrees with the original levelled surfaces. For the purposes of sub-paragraph (ii) of this paragraph shifting boards if fitted will be considered to limit the transverse shift of the surface of the grain;

(iii) the master is provided with a grain loading plan covering the stowage arrangements to be adopted and a stability booklet, both approved by the Administration, or by a Contracting Government on behalf of the Administration, showing the stability conditions upon which the calculations given in sub-paragraph (ii) of this paragraph are based.

(b) The Administration, or a Contracting Government on behalf of the Administration, shall prescribe the precautions to be taken against shifting in all other conditions of loading of ships designed in accordance with paragraph (a) of this Regulation which meet the requirements of sub-paragraphs (ii) and (iii) of that paragraph.

(c) The Administration, or a Contracting Government on behalf of the Administration, shall prescribe the precautions to be taken against shifting in a ship of any other design which meets the requirements of subparagraphs (ii) and (iii) of paragraph (a) of this Regulation.

Regulation 13
WATER BALLAST TANKS

Double bottom tanks which are used to meet a stability requirement in ships loading bulk grain shall have adequate watertight longitudinal sub-division except where the width of the tank measured at half length does not exceed 60 per cent. of the ship's moulded breadth.

Regulation 14
BAGGED GRAIN

Bagged grain shall be carried in sound bags which shall be well filled and securely closed.

Regulation 15
GRAIN LOADING PLANS

(a) A grain loading plan approved for a ship whether by the Administration or by a Contracting Government on behalf of the Administration shall be accepted by other Contracting Governments as evidence that the ship when loaded in accordance with such plans meet the requirements of this Chapter or equivalent arrangements which have been accepted under Regulation 5 of Chapter I.
(b) Such plan shall be approved after taking into account the requirements of this Chapter, the various circumstances of loading on departure and arrival, and the stability of the ship. It shall indicate the main characteristics of the fittings used to prevent the shifting of cargo.

(c) Such plan shall be annotated in one or more languages of which one shall be one of the Convention languages.

(d) A copy of such plan shall be supplied to the master of the ship, who if so required shall produce it for the inspection of the appropriate authority of the port in which loading takes place.

(e) Pending the adoption of international regulations concerning the strength of grain fittings and the provision of feeding holes in hatch coamings, a ship loading grain which does not produce a grain loading plan approved by the Administration, or by a Contracting Government on behalf of the Administration, shall load in accordance with detailed rules issued to supplement the provisions of this Chapter by the Contracting Government of the country in which the loading port is situated.

Regulation 16
EXEMPTIONS FOR CERTAIN VOYAGES

The Administration, or a Contracting Government on behalf of the Administration, may, if it considers that the sheltered nature and conditions of the voyage are such as to render the application of any of the requirements of Regulations 3 to 15 of this Chapter unreasonable or unnecessary, exempt from those particular requirements individual ships or classes of ships.

CHAPTER VII
CARRIAGE OF DANGEROUS GOODS

Regulation 1
APPLICATION

(a) Unless expressly provided otherwise, this Chapter applies to the carriage of dangerous goods in all ships to which the present Regulations apply.

(b) The provisions of this Chapter do not apply to ship's stores and equipment or to particular cargoes carried in ships specially built or converted as a whole for that purpose, such as tankers.

(c) The carriage of dangerous goods is prohibited except in accordance with the provisions of this Chapter.

(d) To supplement the provisions of this Chapter each Contracting Government shall issue, or cause to be issued, detailed instructions on the safe packing and stowage
of specific dangerous goods or categories of dangerous goods which shall include any precautions necessary in their relation to other cargo.

Regulation 2

Classification

Dangerous goods shall be divided into the following classes:

Class 1—Explosives.
Class 2—Gases: compressed, liquefied or dissolved under pressure.
Class 3—Inflammable liquids.
Class 4 (a)—Inflammable solids.
Class 4 (b)—Inflammable solids, or substances, liable to spontaneous combustion.

Class 4 (c)—Inflammable solids, or substances, which in contact with water emit inflammable gases.
Class 5 (a)—Oxidizing substances.
Class 5 (b)—Organic peroxides.
Class 6 (a)—Poisonous (toxic) substances.
Class 6 (b)—Infectious substances.
Class 7—Radioactive substances.
Class 8—Corrosives.
Class 9—Miscellaneous dangerous substances, that is any other substance which experience has shown, or may show, to be of such a dangerous character that the provisions of this Chapter should apply to it.

Regulation 3

Packing

(a) The packing of dangerous goods shall be (i) well made and in good condition; (ii) of such a character that any interior surface with which the contents may come in contact is not dangerously affected by the substance being conveyed and (iii) capable of withstanding the ordinary risks of handling and carriage by sea.

(b) Where the use of absorbent or cushioning material is customary in the packing of liquids in receptacles that material shall be (i) capable of minimising the dangers to which the liquid may give rise, (ii) so disposed as to prevent movement and ensure that the receptacle remains surrounded and (iii) where reasonably possible of sufficient quantity to absorb the liquid in the event of breakage of the receptacle.

(c) Receptacles containing dangerous liquids shall have an ullage at the filling temperature sufficient to allow for the highest temperature during the course of normal carriage.

(d) Cylinders or receptacles for gases under pressure shall be adequately constructed, tested, maintained and correctly filled.
(e) Empty receptacles which have been used previously for the carriage of dangerous goods shall themselves be treated as dangerous goods unless they have been cleaned and dried or, when the nature of the former contents permit with safety, have been closed securely.

Regulation 4

MARKING AND LABELLING

Each receptacle containing dangerous goods shall be marked with the correct technical name (trade names shall not be used) and identified with a distinctive label or stencil of the label so as to make clear the dangerous character. Each receptacle shall be so labelled except receptacles containing chemicals packed in limited quantities and large shipments which can be stowed, handled and identified as a unit.

Regulation 5

DOCUMENTS

(a) In all documents relating to the carriage of dangerous goods by sea where the goods are named the correct technical name of the goods shall be used (trade names shall not be used) and the correct description given in accordance with the classification set out in Regulation 2 of this Chapter.

(b) The shipping documents prepared by the shipper shall include, or be accompanied by, a certificate or declaration that the shipment offered for carriage is properly packed, marked and labelled and in proper condition for carriage.

(c) Each ship carrying dangerous goods shall have a special list or manifest setting forth, in accordance with Regulation 2 of this Chapter, the dangerous goods on board and the location thereof. A detailed stowage plan which identifies by class and sets out the location of all dangerous goods on board may be used in place of such special list or manifest.

Regulation 6

TEMPORARY EXCEPTIONS TO REGULATIONS 4 AND 5

Contracting Governments which have a uniform system of rules for land and sea transport relating to the carriage of dangerous goods and cannot therefore immediately apply the provisions of Regulations 4 and 5 of this Chapter may authorise departures from the provisions of those Regulations for a period not exceeding twelve months from the date on which the Convention comes into force, provided that dangerous goods as classified in Regulation 2 of this Chapter are also so classified in the shipping documents and are labelled accordingly.
Regulation 7

STOWAGE REQUIREMENTS

(a) Dangerous goods shall be stowed safely and appropriately according to the nature of the goods. Incompatible goods shall be segregated from one another.

(b) Explosives (except ammunition) which present a serious risk shall be stowed in a magazine which shall be kept securely closed while at sea. Such explosives shall be segregated from detonators. Electrical apparatus and cables in any compartment in which explosives are carried shall be designed and used so as to minimise the risk of fire or explosion.

(c) Goods which give off dangerous vapours shall be stowed in a well ventilated space or on deck.

(d) In ships carrying inflammable liquids or gases special precautions shall be taken where necessary against fire or explosion.

(e) Substances which are liable to spontaneous heating or combustion shall not be carried unless adequate precautions have been taken to prevent the outbreak of fire.

Regulation 8

EXPLOSIVES IN PASSENGER SHIPS

(a) In passenger ships the following explosives only may be carried:

(i) safety cartridges and safety fuses;
(ii) small quantities of explosives not exceeding 20 pounds (or 9 kilogrammes) total net weight;
(iii) distress signals for use in ships or aircraft, if the total weight of such signals does not exceed 2,240 pounds (or 1,016 kilogrammes);
(iv) except in ships carrying unberthed passengers, fireworks which are unlikely to explode violently.

(b) Notwithstanding the provisions of paragraph (a) of this Regulation additional quantities or types of explosives may be carried in passenger ships in which there are special safety measures approved by the Administration.

CHAPTER VIII

NUCLEAR SHIPS

Regulation 1

APPLICATION

This Chapter applies to all nuclear ships except ships of war.
Regulation 2
APPLICATION OF OTHER CHAPTERS

The Regulations contained in the other Chapters of the present Convention apply to nuclear ships except as modified by this Chapter.

Regulation 3
EXEMPTIONS

A nuclear ship shall not, in any circumstances, be exempted from compliance with any Regulations of this Convention.

Regulation 4
APPROVAL OF REACTOR INSTALLATION

The design, construction and standards of inspection and assembly of the reactor installation shall be subject to the approval and satisfaction of the Administration and shall take account of the limitations which will be imposed on surveys by the presence of radiation.

Regulation 5
SUITABILITY OF REACTOR INSTALLATION FOR SERVICE ON BOARD SHIP

The reactor installation shall be designed having regard to the special conditions of service on board ship both in normal and exceptional circumstances of navigation.

Regulation 6
RADIATION SAFETY

The Administration shall take measures to ensure that there are no unreasonable radiation or other nuclear hazards, at sea or in port, to the crew, passengers or public, or to the waterways or food or water resources.

Regulation 7
SAFETY ASSESSMENT

(a) A Safety Assessment shall be prepared to permit evaluation of the nuclear power plant and safety of the ship to ensure that there are no unreasonable radiation or other hazards, at sea or in port, to the crew, passengers or public, or to the waterways or food or water resources. The Administration, when satisfied, shall approve such Safety Assessment which shall always be kept up-to-date.
(b) The Safety Assessment shall be made available sufficiently in advance to the Contracting Governments of the countries which a nuclear ship intends to visit so that they may evaluate the safety of the ship.

Regulation 8

Operating Manual

A fully detailed Operating Manual shall be prepared for the information and guidance of the operating personnel in their duties on all matters relating to the operation of the nuclear power plant and having an important bearing on safety. The Administration, when satisfied, shall approve such Operating Manual and a copy shall be kept on board the ship. The Operating Manual shall always be kept up-to-date.

Regulation 9

Surveys

Survey of nuclear ships shall include the applicable requirements of Regulation 7 of Chapter I, or of Regulations 8, 9 and 10 of Chapter I, except in so far as surveys are limited by the presence of radiation. In addition, the surveys shall include any special requirements of the Safety Assessment. They shall in all cases, notwithstanding the provisions of Regulations 8 and 10 of Chapter I, be carried out not less frequently than once a year.

Regulation 10

Certificates

(a) The provisions of paragraph (a) of Regulation 12 of Chapter I and of Regulation 14 of Chapter I shall not apply to nuclear ships.

(b) A Certificate, called a Nuclear Passenger Ship Safety Certificate shall be issued after inspection and survey to a nuclear passenger ship which complies with the requirements of Chapters II, III, IV and VIII, and any other relevant requirements of the present Regulations.

(c) A Certificate, called a Nuclear Cargo Ship Safety Certificate shall be issued after inspection and survey to a nuclear cargo ship which satisfies the requirements for cargo ships on survey set out in Regulation 10 of Chapter I, and complies with the requirements of Chapters II, III, IV and VIII, and any other relevant requirements of the present Regulations.

(d) Nuclear Passenger Ship Safety Certificates and Nuclear Cargo Ship Safety Certificates shall state: "That the ship, being a nuclear ship, complied with all requirements of Chapter VIII of the Convention and conformed to the Safety Assessment approved for the ship".

(e) Nuclear Passenger Ship Safety Certificates and Nuclear Cargo Ship Safety Certificates shall be valid for a period of not more than 12 months.
(f) Nuclear Passenger Ship Safety Certificates and Nuclear Cargo Ship Safety Certificates shall be issued either by the Administration or by any person or organization duly authorised by it. In every case, that Administration assumes full responsibility for the certificate.

Regulation 11
SPECIAL CONTROL

In addition to the control established by Regulation 19 of Chapter I, nuclear ships shall be subject to special control before entering the ports and in the ports of Contracting Governments, directed towards verifying that there is on board a valid Nuclear Ship Safety Certificate and that there are no unreasonable radiation or other hazards at sea or in port, to the crew, passengers or public, or to the waterways or food or water resources.

Regulation 12
CASUALTIES

In the event of any accident likely to lead to an environmental hazard the master of a nuclear ship shall immediately inform the Administration. The master shall also immediately inform the competent Governmental authority of the country in whose waters the ship may be, or whose waters the ship approaches in a damaged condition.

APPENDIX

Form of Safety Certificate for Passenger Ships

PASSENGER SHIP SAFETY CERTIFICATE

(Country)

Issued under the provisions of the
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1960

<table>
<thead>
<tr>
<th>Name of Ship</th>
<th>Distinctive Number or Letters</th>
<th>Port of Registry</th>
<th>Gross Tonnage</th>
<th>Particulars of voyages, if any, sanctioned under Regulation 27 (c) (vi) of Chapter III</th>
<th>Date on which keel was laid (see Note) below</th>
</tr>
</thead>
</table>

No. 7794
The undersigned Government certifies

I. That the above-mentioned ship has been duly surveyed in accordance with the provisions of the Convention referred to above.

II. That the survey showed that the ship complied with the requirements of the Regulations annexed to the said Convention as regards:

(1) the structure, main and auxiliary boilers and other pressure vessels and machinery;

(2) the watertight subdivision arrangements and details;

(3) the following subdivision loadlines:

<table>
<thead>
<tr>
<th>Subdivision loadlines assigned and marked on the ship's side at amidships (Regulation II of Chapter II)</th>
<th>Freeboard</th>
<th>To apply when the spaces in which passengers are carried included the following alternative spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. 1</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>C. 2</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>C. 3</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

III. That the life-saving appliances provide for a total number of ....... persons and no more, viz.:

.......lifeboats (including.......motor lifeboats) capable of accommodating ........persons, and ........motor lifeboats fitted with radiotelegraph installation and searchlight (included in the total lifeboats shown above) and ........motor lifeboats fitted with searchlight only (also included in the total lifeboats shown above), requiring ........certificated lifeboatmen;

.......liferafts, for which approved launching devices are required, capable of accommodating ........persons; and

.......liferafts, for which approved launching devices are not required, capable of accommodating ........persons;

.......buoyant apparatus capable of supporting ........persons;

.......lifebuoys;

.......lifejackets.

No. 7794
IV. That the lifeboats and liferafts were equipped in accordance with the provisions of the Regulations.

V. That the ship was provided with a line-throwing appliance and portable radio apparatus for survival craft in accordance with the provisions of the Regulations.

VI. That the ship complied with the requirements of the Regulations as regards radiotelegraph installations, viz.:

<table>
<thead>
<tr>
<th>Requirements of Regulation</th>
<th>Actual provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours of listening by operator</td>
<td>...</td>
</tr>
<tr>
<td>Number of operators</td>
<td>...</td>
</tr>
<tr>
<td>Whether auto alarm fitted</td>
<td>...</td>
</tr>
<tr>
<td>Whether main installation fitted</td>
<td>...</td>
</tr>
<tr>
<td>Whether reserve installation fitted</td>
<td>...</td>
</tr>
<tr>
<td>Whether main and reserve transmitters electrically separated or combined</td>
<td>...</td>
</tr>
<tr>
<td>Whether direction-finder fitted</td>
<td>...</td>
</tr>
<tr>
<td>Number of passengers for which certificated</td>
<td>...</td>
</tr>
</tbody>
</table>

VII. That the functioning of the radiotelegraph installations for motor lifeboats and/or the portable radio apparatus for survival craft, if provided, complied with the provisions of the Regulations.

VIII. That the ship complied with the requirements of the Regulations as regards fire-detecting and fire-extinguishing appliances and was provided with navigation lights and shapes, pilot ladder, and means of making sound signals and distress signals, in accordance with the provisions of the Regulations and also the International Collision Regulations.

IX. That in all other respects the ship complied with the requirements of the Regulations, so far as these requirements apply thereto.

This certificate is issued under the authority of the Government.

It will remain in force until

Issued at the day of 19

Here follows the seal or signature of the authority entitled to issue the certificate.

(Seal)

If signed, the following paragraph is to be added:

The undersigned declares that he is duly authorised by the said Government to issue this Certificate.

(Signature)

NOTE.—It will be sufficient to indicate the year in which the keel was laid except for 1952 and the year of the coming into force of the International Convention for the Safety of Life at Sea, 1960, in which cases the actual date should be given.

In the case of a ship which is converted as provided in Regulation 1 (b) (i) of Chapter II of the Convention, the date on which the work of conversion was begun should be given.
Form of Safety Construction Certificate for Cargo Ships

CARGO SHIP SAFETY CONSTRUCTION CERTIFICATE

(Official Seal) (Country)

Issued under the provisions of the

INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1960

<table>
<thead>
<tr>
<th>Name of Ship</th>
<th>Distinctive Number or Letters</th>
<th>Port of Registry</th>
<th>Gross Tonnage</th>
<th>Date on which keel was laid (see Note below)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The I, the undersigned (Name) Government certifies (Name) certify

That the above-mentioned ship has been duly surveyed in accordance with the provisions of Regulation 10 of Chapter I of the Convention referred to above, and that the survey showed that the condition of the hull, machinery and equipment, as defined in the above Regulation, was in all respects satisfactory and that the ship complied with the applicable requirements of Chapter II (other than that relating to fire extinguishing appliances and fire control plans).

This certificate is issued under the authority of the Government. It will remain in force until

Issued at the day of 19

Here follows the seal or signature of the authority entitled to issue the certificate.

(Seal)

If signed, the following paragraph is to be added:

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

(Signature)

NOTE.—It will be sufficient to indicate the year in which the keel was laid except for 1952 and the year of the coming into force of the International Convention for the Safety of Life at Sea, 1960, in which cases the actual date should be given.
Form of Safety Equipment Certificate for Cargo Ships

CARGO SHIP SAFETY EQUIPMENT CERTIFICATE

(Official Seal) (Country)

Issued under the provisions of the

INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1960

<table>
<thead>
<tr>
<th>Name of Ship</th>
<th>Distinctive Number or Letters</th>
<th>Port of Registry</th>
<th>Gross Tonnage</th>
<th>Date on which keel was laid (see Note below)</th>
</tr>
</thead>
</table>

The (Name) Government certifies

I, the undersigned (Name) certify

I. That the above-mentioned ship has been duly inspected in accordance with the provisions of the Convention referred to above.

II. That the inspection showed that the life-saving appliances provided for a total number of ..........persons and no more viz.:

 ..........lifeboats on port side capable of accommodating ..........persons;

 ..........lifeboats on starboard side capable of accommodating ..........persons;

 ..........motor lifeboats (included in the total lifeboats shown above), including ..........motor lifeboats fitted with radiotelegraph installation and searchlight, and ..........motor lifeboats fitted with searchlight only;

 ..........liferafts, for which approved launching devices are required, capable of accommodating ..........persons; and

 ..........liferafts, for which approved launching devices are not required, capable of accommodating ..........persons;

 ..........lifebuoys;

 ..........lifejackets.

NOTE.—It will be sufficient to indicate the year in which the keel was laid except for 1952 and the year of the coming into force of the International Convention for the Safety of Life at Sea, 1960, in which cases the actual date should be given.

No. 7794
III. That the lifeboats and liferafts were equipped in accordance with the provisions of the Regulations annexed to the Convention.

IV. That the ship was provided with a line-throwing apparatus and portable radio apparatus for survival craft in accordance with the provisions of the Regulations.

V. That the inspection showed that the ship complied with the requirements of the said Convention as regards fire-extinguishing appliances and fire control plans and was provided with navigation lights and shapes, pilot ladder, and means of making sound signals and distress signals, in accordance with the provisions of the Regulations and the International Collision Regulations.

VI. That in all other respects the ship complied with the requirements of the Regulations so far as these requirements apply thereto.

This certificate is issued under the authority of the Government. It will remain in force until

Issued at the day of 19.

Here follows the seal or signature of the authority entitled to issue the certificate.

(Seal)

If signed, the following paragraph is to be added:

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

(Signature)
Form of Safety Radiotelephony Certificate for Cargo Ships

CARGO SHIP SAFETY RADIO TELEPHONY CERTIFICATE

(Official Seal) (Country)

Issued under the provisions of the
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1960

<table>
<thead>
<tr>
<th>Name of Ship</th>
<th>Distinctive Number or Letters</th>
<th>Port of Registry</th>
<th>Gross Tonnage</th>
<th>Date on which keel was laid (see Note below)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

The (Name) Government certifies
I, the undersigned (Name) certify

I. That the above-mentioned ship complies with the provisions of the Regulations annexed to the Convention referred to above as regards Radiotelephony:

<table>
<thead>
<tr>
<th>Hours of listening</th>
<th>Requirements of Regulations</th>
<th>Actual provision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II. That the functioning of the portable radio apparatus for survival craft, if provided, complies with the provisions of the said Regulations.

This certificate is issued under the authority of the Government. It will remain in force until

Issued at the day of 19 .

Here follows the seal or signature of the authority entitled to issue this certificate. (Seal)

If signed, the following paragraph is to be added:

The undersigned declares that he is duly authorised by the said Government to issue this certificate. (Signature)

Note.—It will be sufficient to indicate the year in which the keel was laid except for 1952 and the year of the coming into force of the International Convention for the Safety of Life at Sea, 1960, in which cases the actual date should be given.
Form of Safety Radiotelegraphy Certificate for Cargo Ships

CARGO SHIP SAFETY RADIOTELEGRAPHY CERTIFICATE

Issued under the provisions of the
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1960

<table>
<thead>
<tr>
<th>Name of Ship</th>
<th>Distinctive Number or Letters</th>
<th>Port of Registry</th>
<th>Gross Tonnage</th>
<th>Date on which keel was laid (see Note below)</th>
</tr>
</thead>
</table>

The (Name) Government certifies

I, the undersigned (Name) certify

I. That the above-mentioned ship complies with the provisions of the Regulations Annexed to the Convention referred to above as regards Radiotelegraphy:

<table>
<thead>
<tr>
<th>Requirements of Regulations</th>
<th>Actual provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours of listening by operator</td>
<td>...</td>
</tr>
<tr>
<td>Number of operators</td>
<td>...</td>
</tr>
<tr>
<td>Whether auto alarm fitted</td>
<td>...</td>
</tr>
<tr>
<td>Whether main installation fitted</td>
<td>...</td>
</tr>
<tr>
<td>Whether reserve installation fitted</td>
<td>...</td>
</tr>
<tr>
<td>Whether main and reserve transmitters electrically separated or combined</td>
<td>...</td>
</tr>
<tr>
<td>Whether direction-finder fitted</td>
<td>...</td>
</tr>
</tbody>
</table>

II. That the functioning of the radiotelegraphy installations for motor lifeboats and/or the portable radio apparatus for survival craft, if provided, complies with the provisions of the said Regulations.

This certificate is issued under the authority of the Government.

It will remain in force until

Issued at the day of 19.

Here follows the seal or signature of the authority entitled to issue this certificate.

(Signature)

If signed, the following paragraph is to be added:

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

(Signature)

NOTE.—It will be sufficient to indicate the year in which the keel was laid except for 1952 and the year of the coming into force of the International Convention for the Safety of Life at Sea, 1960, in which cases the actual date should be given.
Form of Exemption Certificate

EXEMPTION CERTIFICATE

(Country)

Issued under the provisions of the

INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1960

<table>
<thead>
<tr>
<th>Name of Ship</th>
<th>Distinctive Number or Letters</th>
<th>Port of Registry</th>
<th>Gross Tonnage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The ___________________________ Government certifies

I, the undersigned ___________________________,

certify

That the above-mentioned ship is, under the authority conferred by Regulation

...........of Chapter...........of the Regulations annexed to the Convention referred to above, exempted from the requirements of ↑.................of the Convention on the voyages.................
to......................................................

* Insert here the conditions, if any, on which the exemption certificate is granted.

This certificate is issued under the authority of the Government.

It will remain in force until

Issued at the day of 19 .

Here follows the seal or signature of the authority entitled to issue this certificate.

(Seal)

If signed, the following paragraph is to be added:

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

(Signature)

† Insert here references to Chapters and Regulations, specifying particular paragraphs.

No. 779
Form of Safety Certificate for Nuclear Passenger Ships

NUCLEAR PASSENGER SHIP SAFETY CERTIFICATE

Issued under the provisions of the

INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1960

<table>
<thead>
<tr>
<th>Name of Ship</th>
<th>Distinctive Number or Letters</th>
<th>Port of Registry</th>
<th>Gross Tonnage</th>
<th>Particulars of voyages, if any, sanctioned under Regulation 27 (c) (vi) of Chapter III</th>
<th>Date on which keel was laid (see Note below)</th>
</tr>
</thead>
</table>

The (Name) Government certifies I, the undersigned (Name) certify

I. That the above-mentioned ship has been duly surveyed in accordance with the provisions of the Convention referred to above.

II. That the ship, being a nuclear ship, complied with all requirements of Chapter VIII of the Convention and conformed to the Safety Assessment approved for the ship.

III. That the survey showed that the ship complied with the requirements of the Regulations annexed to the said Convention as regards:

1. the structure, main and auxiliary boilers and other pressure vessels and machinery;

2. the watertight subdivision arrangements and details;

3. the following subdivision loadlines:

<table>
<thead>
<tr>
<th>Subdivision loadlines assigned and marked on the ship's side at amidships (Regulation 11 of Chapter II)</th>
<th>Freeboard</th>
<th>To apply when the spaces in which passengers are carried include the following alternative spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. 1</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>C. 2</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>C. 3</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>
IV. That the life-saving appliances provided for a total number of ....... persons and no more, viz. :

........lifeboats (including ........motor lifeboats) capable of accommodating ........persons, and ........motor lifeboats fitted with radiotelegraph installation and searchlight (included in the total lifeboats shown above) and ........motor lifeboats fitted with searchlight only (also included in the total lifeboats shown above), requiring ........certificated lifeboatmen;

........liferafts, for which approved launching devices are required, capable of accommodating ........persons; and

........liferafts, for which approved launching devices are not required, capable of accommodating ........persons;

........buoyant apparatus capable of supporting ........persons;

........lifebuoys;

........lifejackets.

V. That the lifeboats and liferafts were equipped in accordance with the provisions of the Regulations.

VI. That the ship was provided with a line-throwing appliance and portable radio apparatus for survival craft, in accordance with the provisions of the Regulations.

VII. That the ship complied with the requirements of the Regulations as regards radiotelegraph installations, viz.:

<table>
<thead>
<tr>
<th>Requirements of Regulations</th>
<th>Actual provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours of listening by operator</td>
<td>...</td>
</tr>
<tr>
<td>Number of operators</td>
<td>...</td>
</tr>
<tr>
<td>Whether auto alarm fitted</td>
<td>...</td>
</tr>
<tr>
<td>Whether main installation fitted</td>
<td>...</td>
</tr>
<tr>
<td>Whether reserve installation fitted</td>
<td>...</td>
</tr>
<tr>
<td>Whether main and reserve transmitters electrically separated or combined</td>
<td>...</td>
</tr>
<tr>
<td>Whether direction-finder fitted</td>
<td>...</td>
</tr>
<tr>
<td>Number of passengers for which certificated</td>
<td>...</td>
</tr>
</tbody>
</table>
VIII. That the functioning of the radiotelegraph installations for motor lifeboats and/or the portable radio apparatus for survival craft, if provided, complied with the provisions of the Regulations.

IX. That the ship complied with the requirements of the Regulations as regards fire-detecting and fire-extinguishing appliances and was provided with navigation lights and shapes, pilot ladder, and means of making sound signals and distress signals, in accordance with the provisions of the Regulations and also the International Collision Regulations.

X. That in all other respects the ship complied with the requirements of the Regulations, so far as these requirements apply thereto.

This certificate is issued under the authority of the Government. It will remain in force until

Issued at the day of 19 .

*Here follows the seal or signature of the authority entitled to issue the certificate.*

(Seal)

*If signed, the following paragraph is to be added:*

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

(Signature)

*Note.—It will be sufficient to indicate the year in which the keel was laid except for 1952 and the year of the coming into force of the International Convention for the Safety of Life at Sea, 1960, in which cases the actual date should be given.

In the case of a ship which is converted as provided in Regulation 1 (b) (i) of Chapter II, the date on which the work of conversion was begun should be given.*
Form of Safety Certificate for Nuclear Cargo Ships

NUCLEAR CARGO SHIP SAFETY CERTIFICATE

(Official Seal) (Country)

Issued under the provisions of the
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1960

<table>
<thead>
<tr>
<th>Name of Ship</th>
<th>Distinctive Number or Letters</th>
<th>Port of Registry</th>
<th>Gross Tonnage</th>
<th>Date on which keel was laid (see Note below)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The (Name) Government certifies (Name) certify</th>
</tr>
</thead>
</table>

I. That the above-mentioned ship has been duly surveyed in accordance with the provisions of the Convention referred to above.

II. That the ship, being a nuclear ship, complied with all requirements of Chapter VIII of the Convention and conformed to the Safety Assessment approved for the ship.

III. That the survey showed that the ship satisfied the requirements set out in Regulation 10 of Chapter I of the Convention as to hull, machinery and equipment, and complied with the relevant requirements of Chapter II.

IV. That the life-saving appliances provide for a total number of ....... persons and no more, viz. :

........lifeboats on port side capable of accommodating ........ persons;

........lifeboats on starboard side capable of accommodating ........ persons;

........motor lifeboats (included in the total lifeboats shown above), including ........ motor lifeboats fitted with radiotelegraph installation and searchlight, and ........ motor lifeboats fitted with searchlight only;

No. 7794
...... liferafts, for which approved launching devices are required, capable of accommodating ...... persons; and

...... liferafts for which approved launching devices are not required, capable of accommodating ...... persons;

...... lifebuoys;

...... lifejackets.

V. That the lifeboats and liferafts were equipped in accordance with the provisions of the Regulations annexed to the Convention.

VI. That the ship was provided with a line-throwing apparatus and portable radio apparatus for survival craft in accordance with the provisions of the Regulations.

VII. That the ship complied with the requirements of the Regulations as regards radiotelegraph installations, viz. :

<table>
<thead>
<tr>
<th>Requirement of Regulations</th>
<th>Actual provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours of listening by operator</td>
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<td>Number of operators</td>
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<tr>
<td>Whether main and reserve transmitters electrically separated or combined</td>
<td>...</td>
</tr>
<tr>
<td>Whether direction-finder fitted</td>
<td>...</td>
</tr>
</tbody>
</table>

VIII. That the functioning of the radiotelegraph installations for motor lifeboats and/or the portable radio apparatus for survival craft, if provided, complied with the provisions of the Regulations.

IX. That the inspection showed that the ship complied with the requirements of the said Convention as regards fire-extinguishing appliances and was provided with navigation lights and shapes, pilot ladder, and means of making sound signals and distress signals in accordance with the provisions of the Regulations and the International Collision Regulations.

X. That in all other respects the ship complied with the requirements of the Regulations so far as these requirements apply thereto.
This certificate is issued under the authority of the Government.
It will remain in force until

Issued at the day of 19

Here follows the seal or signature of the authority entitled to issue the certificate.

(Seal)

If signed, the following paragraph is to be added:

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

(Signature)

Note.—It will be sufficient to indicate the year in which the keel was laid except for 1952 and the year of coming into force of the International Convention for the Safety of Life at Sea, 1960, in which cases the actual date should be given.
List of States in respect of which the International Convention for the Safety of Life at Sea, 1960 entered into force on 26 May 1965, showing the respective dates of deposit of the instruments of acceptance:

<table>
<thead>
<tr>
<th>Country</th>
<th>Date</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haiti</td>
<td>17 March</td>
<td>1961</td>
</tr>
<tr>
<td>Norway</td>
<td>23 August</td>
<td>1961</td>
</tr>
<tr>
<td>France</td>
<td>16 October</td>
<td>1961</td>
</tr>
<tr>
<td>Republic of Vietnam</td>
<td>8 January</td>
<td>1962</td>
</tr>
<tr>
<td>Ghana</td>
<td>22 March</td>
<td>1962</td>
</tr>
<tr>
<td>Peru</td>
<td>25 July</td>
<td>1962</td>
</tr>
<tr>
<td>United States of America</td>
<td>2 August</td>
<td>1962</td>
</tr>
<tr>
<td>Madagascar</td>
<td>13 September</td>
<td>1962</td>
</tr>
<tr>
<td>Morocco</td>
<td>28 November</td>
<td>1962</td>
</tr>
<tr>
<td>Spain</td>
<td>22 January</td>
<td>1963</td>
</tr>
<tr>
<td>Greece</td>
<td>13 February</td>
<td>1963</td>
</tr>
<tr>
<td>Japan</td>
<td>23 April</td>
<td>1963</td>
</tr>
<tr>
<td>Tunisia</td>
<td>20 May</td>
<td>1963</td>
</tr>
<tr>
<td>Cuba</td>
<td>22 August</td>
<td>1963</td>
</tr>
<tr>
<td>Paraguay</td>
<td>11 September</td>
<td>1963</td>
</tr>
<tr>
<td>Algeria</td>
<td>20 January</td>
<td>1964</td>
</tr>
<tr>
<td>Liberia</td>
<td>26 May</td>
<td>1964</td>
</tr>
<tr>
<td>United Kingdom of Great Britain and Northern Ireland*</td>
<td>11 June</td>
<td>1964</td>
</tr>
<tr>
<td>Netherlands</td>
<td>16 October</td>
<td>1964</td>
</tr>
<tr>
<td>Denmark</td>
<td>1 December</td>
<td>1964</td>
</tr>
<tr>
<td>Iceland</td>
<td>11 December</td>
<td>1964</td>
</tr>
<tr>
<td>Yugoslavia</td>
<td>23 February</td>
<td>1965</td>
</tr>
<tr>
<td>Republic of China</td>
<td>23 February</td>
<td>1965</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>3 May</td>
<td>1965</td>
</tr>
<tr>
<td>Finland</td>
<td>11 May</td>
<td>1965</td>
</tr>
<tr>
<td>Kuwait**</td>
<td>14 May</td>
<td>1965</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>21 May</td>
<td>1965</td>
</tr>
<tr>
<td>Federal Republic of Germany***</td>
<td>25 May</td>
<td>1965</td>
</tr>
<tr>
<td>Canada</td>
<td>26 May</td>
<td>1965</td>
</tr>
</tbody>
</table>

* In a note accompanying the instrument of acceptance, the Government of the United Kingdom declared “that while accepting the provisions of Chapter VIII of the Regulations in their entirety, they will legislate to give effect to them as soon as it becomes necessary to do so and will meanwhile act in conformity with Chapter VIII in relation to any foreign nuclear ships.”

** With the following declaration: “In accepting the said Convention, the Government of the State of Kuwait takes the view that its signature and acceptance of the said Convention does not in any way imply its recognition of Israel, nor does it oblige it to apply the provisions of the Convention in respect of the said country. The Government of the State of Kuwait wishes further to indicate that its understanding described above is in conformity with the general practice existing in Kuwait regarding signature, ratification or accession to a Convention of which a country not recognized by Kuwait is a party.”

*** With the following declaration: “This Convention shall also apply to Land Berlin as from the date on which it shall enter into force for the Federal Republic of Germany.”
FINAL ACT OF THE INTERNATIONAL CONFERENCE
ON SAFETY OF LIFE AT SEA, 1960

Upon the invitation of the Inter-Governmental Maritime Consultative Organization, a Conference was held in London from 17 May to 17 June 1960 for the purpose of drawing up a Convention to replace the International Convention for the Safety of Life at Sea signed in London on 10 June 1948¹ as well as for the purpose of revising the International Regulations for Preventing Collisions at Sea, 1948.²

The Governments of the following countries, being desirous of promoting safety of life at sea by establishing in common agreement uniform principles and rules directed thereto, were represented by Delegations at the Conference:

Argentina
Australia
Belgium
Brazil
Bulgaria
Cameroon
Canada
China
Cuba
Czechoslovakia
Denmark
Dominican Republic
Finland
France
Federal Republic of Germany
Greece
Hungary
Iceland
India
Ireland
Israel
Italy
Japan
Republic of Korea
Kuwait
Liberia
Mexico
Netherlands
New Zealand
Norway
Pakistan
Panama
Peru
Philippines
Poland
Portugal
Spain
Sweden
Switzerland
Union of Soviet Socialist Republics
United Arab Republic
United Kingdom
United States of America
Venezuela
Yugoslavia

¹ See footnote 1, p. 30 of this volume.
² United Nations, Treaty Series, Vol. 191, p. 3; for subsequent actions relating to these Regulations, see references in Cumulative Indexes Nos. 2 to 4.

No. 7794
The Governments of the following countries were represented at the Conference by observers:

- Ceylon
- Chile
- Guinea
- Indonesia
- Iran
- Roumania
- Thailand
- Turkey
- Union of South Africa
- Vietnam

The following Inter-Governmental Organizations were also represented by observers at the Conference:

- United Nations
- Food and Agriculture Organization
- International Atomic Energy Agency
- International Civil Aviation Organization
- International Labour Organization
- International Telecommunication Union
- World Health Organization
- World Meteorological Organization
- International Hydrographic Bureau

Sir Gilmour Jenkins, the Leader of the United Kingdom Delegation, was elected President of the Conference. Admiral Alfred C. Richmond, Leader of the Delegation of the United States of America, and Captain Alexander Saveliev, Leader of the Delegation of the Union of Soviet Socialist Republics, were elected First and Second Vice-Presidents respectively. The Secretary-General of the Conference was Mr. William Graham, Deputy Secretary-General of the Inter-Governmental Maritime Consultative Organization.

For the purpose of its work, the Conference set up the following Committees, of which the under-mentioned were Chairmen:

- Heads of Delegations Committee: Sir Gilmour Jenkins (United Kingdom)
- Credentials Committee: Mr. Eleuterio Capapas (Philippines)
- Drafting Committee: Mr. Dennis C. Haselgrove (United Kingdom)
- Committee on General Provisions: Mr. Jean-Georges Roullier (France)
- Committee on Construction: Dr. Ing. Gino Soldà (Italy)
- Committee on Life-Saving Appliances: Mr. Władysław Milewski (Poland)
- Committee on Radio: Mr. Per Mortensen (Norway)
- Committee on Safety of Navigation: Mr. Anders Bache (Denmark)
- Committee on Carriage of Grain, Ore and Bulk Cargoes: Captain P. Pagonis (Greece)
- Committee on Carriage of Dangerous Goods: Mr. A. W. Clarke (United Kingdom)
Committee on Safety of Nuclear-Powered Ships: Mr. Arthur Gatewood (United States)

The Conference had before it and used as a basis for discussion the International Convention for the Safety of Life at Sea, 1948, and the International Regulations for Preventing Collisions at Sea, 1948.

In addition, the Conference, having carefully studied the new problems which have arisen owing to the advent of nuclear propulsion for merchant ships, and having regard to the hazards inherent in nuclear ships, recognised the importance of reaching an international agreement thereon. Considering the technical developments in this field which are likely to take place in the near future, the Conference decided to include in the text of a revised Convention for the Safety of Life at Sea only a small number of Regulations dealing with matters of principle and procedure concerning nuclear ships.¹

As a result of its deliberations, as recorded in the records and reports of the respective Committees, and of the plenary sessions, the Conference prepared and opened for signature and acceptance the International Convention for the Safety of Life at Sea, 1960, to replace the International Convention for the Safety of Life at Sea, 1948. The International Convention for the Safety of Life at Sea, 1960 is appended hereto as Annex A² to this Final Act.

The Conference also had before it and used as a basis for discussion the present International Regulations for Preventing Collisions at Sea. The Conference considered it desirable to revise these Regulations and accordingly prepared and approved revised International Regulations for Preventing Collisions at Sea, but decided not to annex the revised Regulations to the International Convention for the Safety of Life at Sea, 1960.

The Conference invites the Inter-Governmental Maritime Consultative Organization to forward the revised International Regulations for Preventing Collisions at Sea to the Governments which have accepted the present International Regulations for Preventing Collisions at Sea, and also invites the Inter-Governmental Maritime Consultative Organization, when substantial unanimity has been reached as to the acceptance of the revised International Regulations for Preventing Collisions at Sea to fix a date on and after which they shall be applied by the Governments which have agreed to accept them. The Conference requests the Inter-Governmental Maritime Consultative Organization to give not less than one year's notice of this date to the Governments of all States.

¹ See p. 362 of this volume.
² See p. 28 of this volume.
The International Regulations for Preventing Collisions at Sea as revised by the Conference are appended hereto as Annex B\(^1\) to this Final Act.

The Conference adopted a number of Recommendations Applicable to Nuclear Ships (appended hereto as Annex C\(^2\) to this Final Act) in order to provide guidance for Governments in the application of the Regulations included in the International Convention for the Safety of Life at Sea, 1960, and to draw attention to the main problems which at the present stage of technical development require attention.

The Conference also adopted other Recommendations on a number of matters arising from its deliberations. These are appended hereto as Annex D\(^3\) to this Final Act.

IN WITNESS WHEREOF the respective representatives have signed this Final Act.

DONE in London this seventeenth day of June, 1960, in a single copy in English and French, each text being equally authoritative. The original texts will be deposited with the Inter-Governmental Maritime Consultative Organization, together with texts in the Russian and Spanish languages which will be translations.

The Inter-Governmental Maritime Consultative Organization will send certified copies of this Final Act, and copies of the translations in the Russian and Spanish languages, to each of the Governments invited to send representatives or observers to the Conference.

\(^1\) Not reproduced herein; see footnote 1, p. 28 of this volume.

\(^2\) See p. 418 of this volume.

\(^3\) See p. 426 of this volume.
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ANNEX C

RECOMMENDATIONS APPLICABLE TO NUCLEAR SHIPS

Note: Throughout the following Recommendations, “the present Convention” means the “International Convention for the Safety of Life at Sea, 1960”.

Attention is drawn to the Regulations concerning nuclear ships in Chapter VIII of the present Convention.

1. General Safety of Nuclear Ships

(a) Since a casualty involving the non-nuclear features of a nuclear ship, such as a steering gear failure, fire or collision, and so forth, could endanger the nuclear power plant, it is desirable that these features should provide for the maximum practicable safety. A nuclear ship should comply with the relevant requirements of the present Convention, the Administration and a recognised Classification Society. Components and systems such as watertight subdivision, fire protection, bilge pumping arrangements, fire extinguishing arrangements, electrical installations, steering gear, astern power, stability and navigational aids should receive special consideration to ensure that adequate protection is given to the ship to minimise the hazards peculiar to the nuclear power plant. Consideration should be given to the results of past marine casualties involving similar size ships with the intent of preventing the dangerous uncontrolled release of radioactive or toxic materials in the event of similar casualties.

(b) Special attention should be given to general structural strength of nuclear ships and to the local strength of structures in and around the reactor compartment.

(c) A nuclear ship should remain afloat and have sufficient stability when not less than any two adjacent main watertight compartments are flooded, in all anticipated conditions of loading.

(d) Fire protection systems and the watertight integrity should be at least equivalent to the highest standards of the present Convention.

2. General Requirements of Nuclear Power Plant

(a) It should be demonstrated by calculation and experiment that the properties of the plant and the nature of the enclosure provide the maximum practicable protection against accidents or failures resulting in unreasonable radiation at sea or in port, to the crew, passengers or public, or to the waterways, or food or water resources.

1 See p. 28 of this volume.
2 See p. 362 of this volume.

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(b) The reactor installation should be designed to prevent an uncontrolled chain reaction under all foreseeable operational and accident conditions including sinking of the ship.

(c) A nuclear ship equipped with a single-reactor nuclear power plant, the dependability of which has not been proven, should be provided with an emergency propulsion plant capable of propelling the ship at a navigable speed. Such emergency propulsion plant should be in a state of readiness whenever the ship is navigating in territorial waters.

(d) The nuclear power plant should be such as to ensure manœuvrability equivalent to that of a similar conventional ship.

(e) Requirements for standby emergency components for the conventional portions of the nuclear power plant should be in accordance with those for a similar conventional ship. Standby and emergency nuclear components should be considered and developed in relation to the type of nuclear power plant used.

(f) Where standby systems are essential to the safe operation of the reactor installation, they should be so separated from the main systems as to give maximum protection in the event of an accident.

(g) An emergency source of power should be provided which is capable of furnishing power to the components necessary for safely shutting down the reactor installation and retaining it in a safe condition.

(h) The reactor compartment should contain no inflammable materials other than those necessary for use in the reactor installation.

(i) Reactor materials which are chemically reactive with air or water to a dangerous degree should not be used unless it can be shown that adequate safeguards are incorporated in the particular system.

(j) The machinery and reactor installation should be designed to operate satisfactorily under seagoing conditions having regard to the ship’s attitude, accelerations and vibrations.

(k) Reactor cooling systems should provide for the safe removal of decay heat from the reactor and should prevent excessive temperature conditions under all foreseeable operational and accident conditions at angles of heel and list within the stability range. Failure of decay heat removal facilities should not result in the release of hazardous amounts of radioactive or toxic materials from the enclosure of the reactor installation.

(l) Adequate reactor controls, protective devices and instrumentation should be provided.

(m) Necessary controls and instrumentation should be arranged to permit control of the reactor installation from outside its enclosure.

3. Protection and Enclosure of Reactor Installation

(a) The reactor installation should be so arranged, protected and securely fastened as to minimise the probability of its damage in the event of a ship accident.
(b) The reactor installation should be provided with enclosures, systems, or arrangements which in the event of damage to its components will prevent the release of hazardous amounts of radioactive or toxic materials into service and accommodation spaces and the ship's environment. These outer enclosures, systems, or arrangements should be subjected to suitable tests to demonstrate satisfactory performance under all foreseeable conditions of accident.

(c) The enclosures, systems or arrangements should be located in such a manner as to minimise damage in the event of collision or grounding. In construction, arrangements should be made, if practicable, to facilitate the possible salvage of the reactor or of its essential parts from the vessel in the event of shipwreck, without adversely affecting the safety of the reactor installation under normal conditions.

(d) Facilities should be provided to ensure that fires within and without the reactor installation do not impair the integrity of the enclosures, systems, or arrangements provided, or the arrangements provided for safely shutting down the reactor installation and retaining it in a safe condition.

4. **Shielding and Radiation Safety**

(a) A nuclear power plant should be provided with reliable biological shielding to protect persons on board ship or within the immediate vicinity of the ship against hazardous effect of radiation under normal and accident conditions. Maximum permissible levels of radiation in accommodation and service spaces should be in accordance with international levels when established.

(b) Maintenance and operation instructions in regard to appropriate radiation protection should be worked out for every nuclear ship. Knowledge of these instructions by the nuclear power plant personnel should be periodically checked by the Administration.

(c) Radiation monitoring instruments should be installed at appropriate locations. These should give warning in the event of any radiation exceeding a predetermined safe level.

5. **Radioactive Wastes**

(a) Special arrangements should be provided for the safe temporary storage, where necessary, and for the safe disposal of solid, liquid and gaseous radioactive wastes.

(b) Monitoring devices should be provided for these waste disposal systems. These should give warning and, if necessary, take action in the event of any radiation exceeding a predetermined safe level.

(c) The maximum permissible levels of radiation for waste disposal on the high seas should be in accordance with international levels when established.

6. **Fuelling and Maintenance**

(a) Reactor fuelling should be carried out exclusively at locations suitably equipped for this purpose.
(b) Arrangements should be provided to ensure that de-fuelling, re-fuelling, servicing and maintenance can be carried out without unacceptable exposure of personnel to radiation and without hazardous release of radioactive or toxic materials to the environment.

7. Manning

The master, officers and members of the crew of a nuclear ship should possess qualifications and have undergone proper training appropriate to their responsibilities and duties in accordance with arrangements provided by the Administration. Such personnel should also be instructed as to the precautions to be taken in the matter of radiological protection.

8. Operating Manual

The Operating Manual should provide detailed operating procedures for the various equipment and systems under normal and accident conditions, as well as provide for the maintenance of adequate records of operation, radiation levels, waste disposal, and tests and inspections pertinent to the safety of the reactor installation.

9. Safety Assessment

(a) The Safety Assessment should include sufficiently detailed information to permit qualified personnel to assess the safety of the ship and its power plant, including standards and procedures followed, and to determine whether initial and continued performance will be safe. Typical items which the safety assessment should include are a description of the ship; propulsion and reactor systems; a discussion of the operation under normal sea, port and emergency conditions; a description of reactor control; protection and enclosure; radiation protection; radioactive waste disposal; fuelling; standby and emergency components; test procedures; manning and training requirements; and an evaluation of credible accidents which indicates that the hazards are minimised. The Safety Assessment should indicate that the reactor installation does not constitute an undue hazard, to the crew, passengers or the public, or to the waterways, or food or water resources.

(b) The content of the Safety Assessment should not be considered limited to the information suggested herein, and such additional specific data as necessary should be made available. The complete Safety Assessment should be prepared for the first installation of a reactor type in a ship type. For second and following generation reactor and ship types where performance and safety have been demonstrated, acceptance may be based on an analysis of deviations from the previous design.
10. **Publication of Requirements**

The Contracting Governments should publish any special requirements which they make regarding the approach, entry into, for stay in their ports of a nuclear ship.

11. **Special Control**

After the safety of the nuclear ship and its nuclear power plant has been properly established, the following actions should, in general, be adequate to determine their safe operational conditions:

(a) Examination of the daily log of the behaviour of the nuclear power plant and equipment, covering a reasonable period of between one week to one month including the stay in the last port.

(b) Determination that the nuclear power plant is properly certified and that any periodic checks required by the Operating Manual have been complied with.

(c) Determination that radiation levels in areas within the ship and in the vicinity of the ship which are accessible to shore personnel are not in excess of maximum permissible levels specified by the Operating Manual to be determined by examination of the ship's records or by independent measurement.

(d) Determination of the quantity and activity of radioactive waste stored aboard the ship by examination of the ship's records or by independent measurement, and of the procedures and programme for any disposal.

(e) Determination that the reactor installation protection and enclosure is intact, and that any programme involving a breach of its integrity complies with the requirements of the Operating Manual.

(f) Determination that conventional and emergency arrangements and equipment, the reliability of which is essential when navigating in narrow waters, are in efficient operating condition.

**ANNEX D**

**RECOMMENDATIONS**

Throughout the following Recommendations "the present Convention" means the International Convention for the Safety of Life at Sea, 1960,¹ and "the Organization" means the Inter-Governmental Maritime Consultative Organization.

The following are the Recommendations adopted by the Conference.

¹ See p. 28 of this volume.
1. **Denunciation of the International Convention for the Safety of Life at Sea, 1948**¹

The Conference recommends that Governments should accept the present Convention at as early a date as possible, and that the Governments which become parties to the present Convention should denounce the International Convention for the Safety of Life at Sea, 1948, and should co-operate with one another with a view to ensuring that their respective denunciations become effective on a date twelve months after the date on which the present Convention comes into force.

2. **Special Application of Convention Standards**

The Conference, having excluded fishing vessels and certain cargo ships from the scope of particular provisions of the present Convention in recognition that the Convention requirements in question might not be applicable to such ships without modification, recommends that Contracting Governments should apply the principles of the present Convention to all such ships belonging to their countries as far as is reasonable and practicable. In particular it recommends Governments to take steps to ensure at least the same standards of safety for crews of fishing vessels as for crews of other ships, taking into account existing experience of the use of inflatable liferafts in fishing vessels.

The Conference, moreover, recognising that safety of life at sea will be promoted by the fullest possible availability of radio on ships, recommends that all Contracting Governments should consider the possibility of extending, with such modifications as may be necessary, the requirements for radio installations so that such installations should, in so far as practicable, be carried by ships, including coasting ships and fishing vessels, not covered by the present Convention, on voyages in the open sea.

The Conference further recommends that Contracting Governments should take steps to ensure that, when ports in their countries are used by ships belonging to countries whose Governments are not parties to the present Convention, such ships should be required to conform to standards not lower than those prescribed by the present Convention.

3. **Inspection and Survey by Non-Governmental Organizations**

The Conference, recognising that—

(a) under Regulation 6 of Chapter I of the present Convention, a Contracting Government may entrust the inspection and survey of ships to Organizations recognised by it;

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¹ See footnote 1, p. 30 of this volume.
(b) under Regulation 13 of Chapter I of the present Convention Contracting Governments are from time to time requested to arrange for the inspection and survey of ships in ports where their own facilities are not available; and

(c) information as to any arrangements made in accordance with (a) above would be helpful to other Contracting Governments in making similar arrangements;

Recommends that Contracting Governments should notify to the Organization the names of the non-governmental organizations entrusted with such duties, and that the Organization should circulate the information so obtained to Contracting Governments.

4. Fishing Vessels

The Conference recommends that Contracting Governments should transmit to the Organization information as to the extent to which they have found it practicable to apply the appropriate provisions of the Convention to fishing vessels, with a view to such information being disseminated to Contracting Governments and the Food and Agriculture Organization of the United Nations.

5. Use of “Gross Tonnage” as a Parameter in Future Conventions

The Conference recommends that a study should be made by Contracting Governments of the question whether in future Conventions the present use of “gross tonnage” as a parameter should be replaced by another parameter which indicates the size of the ship and which will ensure uniformity in the application of the requirements of the Convention by Contracting Governments.

Recommendations concerning the Convention Provisions relating to Construction (Chapter II)

6. Standards of Watertight Subdivision of Passenger Ships

The Conference has considered carefully the question of the watertight subdivision of passenger ships in the light of the results achieved since the International Convention for the Safety of Life at Sea, 1948, came into force, and has agreed on certain additional requirements calculated to secure greater safety. It recognises, however, that the questions of watertight subdivision and stability deserve further study which the limited time available to the present Conference did not permit, and accordingly recommends that the Organization should at the earliest practicable date initiate further studies of watertight subdivision on the basis of proposals which any participating Government may submit, including proposals submitted to the Conference. The objective should be to review the existing criteria of subdivision, stability and damage and to consider the relative merits of these criteria in comparison with other possible criteria from the point of view of safety and practicability.
7. **Intact Stability of Passenger Ships, Cargo Ships and Fishing Vessels**

The Conference, having considered proposals made by certain Governments to adopt as part of the present Convention Regulations for intact stability, concluded that further study should be given to these proposals and to any other relevant material which may be submitted by interested Governments.

The Conference therefore recommends that the Organization should, at a convenient opportunity, initiate studies, on the basis of the information referred to above, of:

(a) intact stability of passenger ships,  
(b) intact stability of cargo ships,  
(c) intact stability of fishing vessels, and  
(d) standards of stability information, taking into account the decisions of the present Conference on requirements for damage stability and the results of any further studies which may be carried out by the Organization on the subdivision and damage stability of cargo ships in pursuance of Recommendation 8 of the Conference, the object being the formulation of such international standards as may appear necessary.

The Conference further recommends that in such studies the Organization should take into account studies already undertaken by the Food and Agriculture Organization of the United Nations on the stability of fishing vessels and should co-operate with that Organization on that aspect of the matter.

8. **Subdivision and Damage Stability of Cargo Ships**

The Conference, having considered proposals made by certain Governments to include in the present Convention regulations concerning the subdivision and damage stability of cargo ships, and having regard to the studies which the Organization is already undertaking on the subject of tonnage measurement, recommends that the Organization should, at an early date, initiate studies on the extent to which it would be reasonable and practicable to apply subdivision and damage stability requirements to cargo ships, taking into consideration the proposals referred to above and any other material which interested Governments may make available, and having as its aim the formulation of such international standards as may appear necessary.

9. **Openings in Bulkheads and Shell Plating**

The Conference, recognising the objection which attaches to openings, which may sometimes be open at sea, in the shell plating of ships and in the main watertight bulkheads, nevertheless considered that it is not presently practicable to adopt international regulations concerning such openings which are more exacting than those incorporated in the present Convention. It recognised, however, that the question of such openings, especially sidescuttles at the side shell below the bulkhead deck, deserves continued study.

The Conference therefore recommends that Contracting Governments make special efforts to ensure that the number of such openings, particularly opening sidescuttles below the bulkhead deck and doors low down in the machinery space bulkheads, be kept at the minimum required in each case.
10. **Means of Going Astern**

The Conference, having considered the necessity for, and practicability of, adopting detailed Regulations in the Convention for power for going astern is of the opinion that further experience should be gained to determine the extent to which any additional Regulations dealing with power for going astern are required before promulgating such requirements.

The Conference therefore recommends that a further study should be made by Contracting Governments of the subject of power for going astern and that information on this subject should be exchanged between Governments.

11. **Test Procedures for Fire Resisting and Retarding Divisions, Deck Coverings and Flame-spread Characteristics**

The Conference, noting that wide differences exist between the different test procedures adopted by Governments for "A" and "B" Class bulkheads, the resistance of surfaces to flame-spread, and the fire-resistant characteristics of deck coverings, recommends that, with a view to achieving greater uniformity of practice in these matters, Contracting Governments should provide the Organization with sufficient copies of any document setting out the test procedures they employ, for circulation to other Contracting Governments.

12. **Availability of Pressure in Fire Mains**

The Conference, while recognising the importance of shore-based fire-fighting facilities in dealing with fires on board ships in port, considers that additional precautions should be taken at such time due to the hazards involved. The Conference accordingly recommends that Contracting Governments should ensure that, wherever possible while ships are in port, the fire pumps are available for immediate use if there is no shore connection to the fire main.

13. **International Shore Connection**

The Conference, recognising that for fire fighting on board ships there is a need for a universal coupling from ship to ship and from ship to shore, has decided to require an international shore connection on board ships complying with the present Convention so that connection can be made from ship to ship and from ship to shore in order to supply water to the fire main and to the sprinkler system.

The Conference accordingly recommends that Contracting Governments should request port or other appropriate authorities in their countries to provide similar arrangements on shore by providing adaptors having at one end the usual coupling or flange of the hoses or hydrants used in the port.
The description of the international shore connection is given below and in the appended sketch. ¹

Outside diameter: 7 inches (or 178 millimetres).
Inner diameter: 2 3/4 inches (or 64 millimetres).
Bolt circle diameter: 5 3/4 inches (or 140 millimetres).
Holes: four holes of 3/4 inch (or 19 millimetres) diameter equidistantly placed.
Flange thickness: 9/16 inch (or 14.5 millimetres) minimum.
Bolts: four each of 5/8 inch (or 16 millimetres) diameter and 2 inches (or 50 millimetres) in length.
Flange surface: Flat face.
Material: Any suited to 150 pounds per square inch (or 10.5 kilogrammes per square centimetre) service.
Gasket: Any suited to 150 pounds per square inch (or 10.5 kilogrammes per square centimetre) service.

14. Carbon Dioxide Cylinders (recharging and filling)

The Conference, recognising that difficulties have arisen from lack of reciprocal acceptance of carbon dioxide cylinders, used for fire extinguishing installations in ships, when sent by overland transport for recharging in other than the country of origin, recommends that Contracting Governments should take such steps as may be necessary to permit transportation of cylinders to and from recharging facilities, and to permit recharging of cylinders in accordance with the requirements of the installation as approved for any particular ship by the Government concerned.

In addition, the Conference recognises that there are variations in national practice in the filling ratio of carbon dioxide cylinders and, having regard to the danger that the efficiency of a carbon dioxide fire smothering system would be impaired if the cylinders were filled to the wrong capacity, further recommends that endeavours should be made to secure international agreement on the adoption of standard filling ratios, such as two-thirds for tropical zones and three-quarters for temperate zones.

15. Safety Measures in Tankers

The Conference, recognising the importance of safety measures in the construction and operation of tankers in connection with the fire and explosion risks involved, recommends that Contracting Governments should exchange information on the following matters:
(a) the establishment of international limits for the classes of liquids transported, and
(b) the preparation of internationally applicable regulations covering the safety measures to be taken in tankers, which measures would replace the present requirements of individual Governments and port authorities.

¹ See p. 438 of this volume.
International Shore Connection (Shore)
16. *Carriage of Explosives*

The Conference, considering that the carriage of explosives on board cargo ships presents fire protection problems and that, for the majority of explosives so carried, sprinkling or flooding of the explosives constitutes the only possible protection against the risk of a rise in temperature which would affect their chemical stability; considering, moreover, that uncontrolled flooding of a hold by a large quantity of water incurs the risk of dangerously affecting the buoyancy and stability of many cargo ships, especially the smaller type; is of the opinion that the segregation of explosives from other cargoes in ships and particularly incompatible cargoes should be the subject of further study by Contracting Governments.

The Conference therefore recommends that Contracting Governments should provide the Organization with sufficient copies for circulation to other Governments of any relevant material on this question and particularly on the possibility of reserving, for the carriage of explosives, holds or magazines of such size that flooding by water does not dangerously affect the safety of the ship.

17. *Effect of Tonnage Measurement Regulations on Safety*

The Conference, considering that the present treatment of open spaces in sea-going ships may not always secure the highest practicable degree of safety, recommends that the Organization should examine the influence of tonnage measurement regulations on the design of ships in regard to their seaworthiness, safety and fire protection and, in particular, the desirability of

(a) dispensing with the closing appliances now prescribed or substituting these by watertight closing appliances; and

(b) altering the present methods of tonnage measurement to improve the safety of ships.

**Recommendations Concerning the Convention Provisions Relating to Life-Saving Appliances (Chapter III)**

18. *Freeboard of Lifeboats*

The Conference recommends that, in complying with paragraph (a) of Regulation 5 of Chapter III of the present Convention, Contracting Governments should require the freeboard of a lifeboat to be not less than 44 per cent. of the moulded depth, nor less than 6 per cent. of the lifeboat.

The Conference further recommends that the initial metacentric height of a lifeboat loaded with its full complement of persons and equipment should be not less than the following:

\[
h > \frac{2.8nB^2}{DF}
\]

where \( h \) is the initial metacentric height in metres

\( n \) is the number of persons in the boat

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B is the width of the boat in metres
D is the displacement of water in kilogrammes
and F is the freeboard in metres.

19. **Lifeboats Constructed of Reinforced Plastic Material**

The Conference recommends that, in the present state of development of lifeboats constructed of reinforced plastic material, Contracting Governments should ensure careful inspection of lifeboats of this type at all stages of construction.

The Conference further recommends that Contracting Governments should prescribe, for the prototype lifeboat and specified subsequent lifeboats of the same design, the strength tests which they deem appropriate having regard to their own experience with this type of lifeboat.

20. **Tanker Lifeboats**

The Conference, bearing in mind the need for tanker lifeboats to be capable of resisting fire when attached to davits, and of being safely lowered with their full complement and then cleared from the ship’s side in conditions of fire on the surface of the water, recommends that Contracting Governments should continue their studies into the requirements for tanker lifeboats and that, in particular, such studies should embrace the following points:

(a) the need for tanker lifeboats to be of non-inflammable and fire-resisting materials, and to be adequately insulated;

(b) the provision of a water spray to cool the lifeboat to the maximum extent possible; and

(c) the provision of means of protecting the occupants against fire, high temperature and smoke.

The Conference further recommends that Contracting Governments should report the results of any researches on these matters to the Organization with a view to their being disseminated.

21. **Emergency Repair of Lifeboats**

The Conference recommends that Contracting Governments should encourage experiments to find a suitable self-setting material for the emergency repair of minor damage to all types of material used in lifeboat construction.

22. **Instruction of Seafarers in First Aid and Survival at Sea**

The Conference recommends that Contracting Governments should encourage the instruction, in accordance with standards prescribed by each Government, of their seafarers in first-aid and survival at sea.

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23. **Survey of Inflatable Liferafts**

The Conference, recognising that in the present state of development of inflatable liferafts it is necessary to survey them at intervals of not more than one year, recommends that Contracting Governments should make provision accordingly and that, where servicing stations for inflatable liferafts are set up, they should comply with the requirements of the Government of the country in which they are situated.

For the purposes of this Recommendation, a servicing station is a suitably equipped place at which periodic-surveys of inflatable liferafts can be undertaken and any necessary repairs carried out.

24. **Superimposition of Lifeboats**

The Conference, having adopted in the present Convention provisions prohibiting the stowage of lifeboats one above another, or one within another, under a single set of davits, nevertheless recommends Contracting Governments to examine and report to the Organization all developments which may take place in the stowage of lifeboats in this manner, in order that consideration may be given through the Organization to permitting the use of any system which is considered to be sufficiently free from the disadvantages of present methods of superimposition.

**Recommendations Concerning the Convention Provisions Relating to Radiotelegraphy and Radiotelephony (Chapter IV)**

25. **Exemptions Granted under Regulation 5 of Chapter IV of the Present Convention**

The Conference, considering that Regulation 5 (c) of Chapter IV of the present Convention requires each Contracting Government to submit to the Organization, as soon as possible after the 1st of January in each year, a report showing all exemptions granted under paragraphs (a) and (b) of Regulation 5 of Chapter IV during the previous calendar year together with the reasons for granting such exemptions, and considering also that a summary of the information obtained in this way, classified according to the reasons for granting the exemptions, would be helpful to Contracting Governments, recommends that the Organization should circulate to Contracting Governments a summary report in suitable form every three years showing the numbers of exemptions granted in relation to the reasons for granting them.

26. **Listening for Distress Calls**

The Conference, recognising that shore-based radio facilities make important contributions to safety of life at sea, recommends that:

(a) Contracting Governments should give consideration to establishing and maintaining, so far as is practicable during the hours of service, continuous listening on the radio-
telegraph distress frequency prescribed by the Radio Regulations, by a qualified 
operator using headphones or loud-speaker in coastal radiotelegraph stations which 
work in the medium frequency bands;

(b) Contracting Governments should give consideration to establishing and maintaining, 
so far as is practicable during the hours of service, continuous listening on the radiotelegraph frequency prescribed by the Radio Regulations for use by survival craft 
in the bands between 4,000 kc/s and 27,500 kc/s, by a qualified operator using head-
phones or loud-speaker in at least one of the land radiotelegraph stations under their 
jurisdiction which work in the high frequency bands;

(c) in order to encourage for safety purposes the installation of radiotelephone equip-
ment in small ships, each Contracting Government, so far as is practicable, should 
establish or encourage the establishment of coastal radiotelephone stations working 
in the medium frequency radiotelephone bands;

(d) each Contracting Government, having regard to the area served by its radiotelephone 
coast stations, should maintain, during the hours of service, continuous listening on 
the radiotelephone distress frequency by a qualified operator using headphones or 
loud-speaker so far as is practicable, in a sufficient number of radiotelephone coast 
stations under its jurisdiction to reduce to a minimum the possibility of a radiotelephone distress call not being received.

27. **Interference Level on the Radiotelegraph Distress Frequency**

The Conference, recognising that at present there is a tendency to increase the maxi-
mum power of radiotelegraph installations, and that this may lead to an increase in the 
interference level on the radiotelegraph distress frequency which may considerably impair 
the use of this frequency for safety purposes, recommends that the International Tele-
communication Union should be invited by the Organization to consider what measures 
can be taken to prevent such an increase in the interference level.

28. **Frequency Coverage of Reserve Radiotelegraph Receivers**

The Conference, recognising the importance of ensuring reception by ships of messages 
concerning safety of navigation, recommends that Contracting Governments should 
encourage the installation in ships of reserve radiotelegraph receivers which are capable 
of receiving not only the radiotelegraph distress frequency but also such of the frequencies 
and classes of emission used for the transmission of time signals, meteorological messages 
and such other communications relating to safety of navigation as may be considered 
necessary.

29. **Interference by Aerials attached to Broadcast Receivers**

The Conference, recognising that aerials attached to broadcast receivers may, unless 
adequately controlled, cause serious interference to the radiocommunication and direction-
finding services of ships; and having regard to the requirement in Regulation 9 (g) of Chapter IV of the present Convention that, in ships provided with a radiotelegraph station, in compliance with Regulation 3 or Regulation 4 of Chapter IV of the present Convention, steps shall, if necessary, be taken to ensure that these aerials do not cause interference to the efficient and correct working of the station, recommends as a guide

(a) that in new ships provided with a radiotelegraph station in compliance with Regulation 3 or Regulation 4 of Chapter IV all broadcast receivers should be attached to a communal aerial system, or to efficient and properly installed aerials which, in the case of a ship fitted with direction-finding apparatus:

(i) are outside a radius of 50 feet from the direction-finding aerial; or

(ii) do not rise above the base of the direction-finding aerial; or

(iii) can be lowered quickly and stowed easily when the direction-finder is in use, and

(b) that similar measures should, wherever practicable, be taken in respect of new ships which are provided with a radiotelephone installation in compliance with Regulation 4 of Chapter IV of the present Convention; and in respect of existing ships which are provided with either a radiotelegraph or radiotelephone installation in compliance with Regulation 3 or Regulation 4 of Chapter IV.

30. **Automatic Radiotelegraph Alarm Signal Keying Device**

The Conference, recognising that the automatic radiotelegraph alarm signal keying device required by paragraph (r) of Regulation 9 of Chapter IV of the present Convention would enable an unskilled person to operate the reserve transmitter of a radiotelegraph station in the event of the radio officer becoming disabled at a time when a distress call was necessary, and that the transmission could, when used in this manner, attract attention and provide signals by means of which other ships could locate the casualty, recommends that:

(a) in new installations, the automatic radiotelegraph alarm signal keying device may be combined with additional facilities which would enable the transmission of the following:

(i) the radiotelegraph alarm signal;

(ii) the radiotelegraph distress call;

(iii) a long dash;

(b) the additional facilities should not prevent the proper functioning of the automatic radiotelegraph alarm signal keying device required by paragraph (r) of Regulation 9 of Chapter IV; and

(c) Contracting Governments which require these additional facilities to be fitted should arrange for the display of suitable instructions for the bringing into operation of the reserve transmitter by unskilled personnel. These instructions should set out clearly the procedure to be followed in transmitting the radiotelegraph alarm signal and distress call as set out in the appropriate paragraphs of the Radio Regulations, Geneva, 1959.
31. Direction-Finding on the Radiotelephone Distress Frequency

The Conference, considering that the provision of direction-finding apparatus capable of operation on the radiotelephone distress frequency of 2,182 kc/s in ships required by Regulation 12 of Chapter V of the present Convention to be fitted with direction-finding apparatus may possibly, in the future, provide a valuable aid to the location of small vessels in distress and of survival craft provided with radiotelephone equipment, and recognising that the International Radio Consultative Committee is at present studying this subject, recommends that the Organization should keep the progress of this study under review, should evaluate developments in this field, and, if and when appropriate, should make recommendations to Contracting Governments on this subject.

32. Radiotelegraph Installation for fitting in Motor Lifeboats

The Conference, recognising the importance to safety of life at sea of quickly locating survival craft, recommends that Contracting Governments should encourage the provision in the radiotelegraph installation for fitting in motor lifeboats of an automatic keying device which will transmit not only the radiotelegraph alarm and distress signals but also the call sign of the lifeboat and a long dash for direction-finding purposes.

33. Radiotelephone Listening Watch Equipment

The Conference, considering that Regulation 7 of Chapter IV of the present Convention prescribes the conditions under which a listening watch on the radiotelephone distress frequency shall be maintained on board ships subject to Regulation 4 of that Chapter, and that Regulation 15 (g) of Chapter IV prescribes the methods to be followed in ensuring that the listening watch receiver is correctly tuned to the radiotelephone distress frequency, and bearing in mind that it is desirable to adopt a listening arrangement which will cause the least possible disturbance in the operation of the ship and will make it possible to carry out the prescribed listening under the best possible conditions, recommends that, before adopting a listening watch equipment for use in ships fitted with radiotelephony, Contracting Governments should take into account the following considerations:

I. Receiver

(a) If a receiver other than the main receiver is used as the listening watch receiver,

(i) the selectivity should be such as to produce a practically uniform sensitivity in a band of 3.5 kc/s on each side of the radiotelephone distress frequency, and outside that band a sensitivity decreasing as rapidly as possible in conformity with the best engineering practice;

(ii) the sensitivity should be not less than that required of the main receiver by Regulation 15 (f) of Chapter IV of the present Convention;

(iii) the number of controls should be kept to a minimum;

(iv) the power consumption should be as low as practicable.
(b) Whatever receiver is used for the listening watch, it should have an output power sufficient to operate a loud-speaker, either when used alone or when fitted with any of the devices mentioned in Section II below.

II. Filtered Loud-speakers

The loud-speaker may be fitted with:

(a) a filtering unit maintaining the output level of the two alarm signal frequencies at approximately the speech level normally used for listening, and capable of reducing the strength of other audio frequencies. This filtering unit should be such that its effect can be removed when the radiotelephone alarm or distress signal is received so as to facilitate listening to the distress message; and

(b) in addition, if it is so desired, a device which will, when used in conjunction with the filter mentioned in paragraph II (a) above, silence the loud-speaker in the absence of a radiotelephone alarm signal. This device should be capable of being easily switched in and out since it is intended to be used only in the circumstances described in paragraph (b) (ii) of Regulation 7 of Chapter IV of the present Convention.

III. Miscellaneous Specifications

(a) If filters are used, the frequencies of maximum response of the filters should be subject to a tolerance of ± 1.5 per cent. The response should not fall to a level below 50 per cent. of the maximum response on frequencies differing at most by 3 per cent. from the maximum response frequency.

(b) If the device mentioned in paragraph II (b) above is fitted, it should, when switched on, in the absence of noise or interference, and if a radiotelephone alarm signal is received, be capable of setting the loud-speaker in operation as quickly as possible, and at most six seconds after receipt of the alarm signal.

(c) If the receiver is provided with its own aerial, measures should be taken to prevent damage to the receiver when the ship's transmitter is transmitting.

(d) The receiver, loud-speaker and accessory devices should be sufficiently robust to require only the minimum of maintenance while the ship is at sea and to withstand vibrations, humidity and the effects of variation in temperature and voltage resulting from the special conditions prevailing on board ship at sea, and should continue to function under such conditions.

34. Recommendations of the International Radio Consultative Committee (C.C.I.R.)

The Conference, recognising that certain recommendations of the International Radio Consultative Committee would be of assistance to Contracting Governments in the uniform implementation of the Regulations of the present Convention with regard to radio installations, recommends that Contracting Governments should have regard to those provisions of Recommendations No. 45 and No. 218 of the International Radio Consultative Committee which are not included in the present Convention.
RECOMMENDATIONS CONCERNING THE CONVENTION PROVISIONS RELATING TO SAFETY OF NAVIGATION (CHAPTER V)

35. Cyclonic Storm Warnings

The Conference, considering that it is better to prevent disaster than merely to render assistance, and bearing in mind that use may be made of the radiotelegraph and radiotelephone alarm signals to prevent disaster,

(a) recommends Contracting Governments to authorise selected coast stations to precede the initial broadcasting by radiotelegraph or radiotelephone of urgent cyclonic storm warnings by the appropriate alarm signal, wherever such a procedure is suitable (e.g., where the station is itself near the centre of anticipated path of the cyclonic storm) and

(b) further recommends that, in order to minimise interference where several countries lie close together adjoining a sea area, a single coast station might be selected by agreement between the Governments of those countries to make these broadcasts for the area.

36. Depth-sounding Apparatus

The Conference recommends that Contracting Governments should encourage the development and use of reliable echo depth-sounding apparatus.

37. Lights on Land

The Conference recommends that, so far as practicable, steps should be taken by Contracting Governments to regulate the position and the intensity of lights on land in the vicinity of the entrances to ports so as to ensure that such lights cannot be mistaken for, or do not impair the visibility of, the navigation lights of the port.

38. Transmission of Weather Messages

The Conference, recognising the value to safety at sea of radio weather messages from ships transmitted to appropriate shore stations in accordance with Regulation 4 of Chapter V of the present Convention, recommends that Contracting Governments should arrange that such messages should be free of cost to the ship concerned and should make adequate arrangements for the radio reception of such messages.

39. Training of Masters, Officers and Seamen in the Use of Aids to Navigation and other Devices

The Conference

(i) having in mind the provisions of Regulation 13 of Chapter V of the present Convention in regard to the manning of ships from the point of view of safety of life at sea;
(ii) taking due account of the provisions of the two Conventions adopted by the International Labour Conference, that is to say, the Officers' Competency Certificates Convention, 1936 (No. 53)\(^1\) and the Certification of Able Seamen Convention, 1946 (No. 74)\(^2\);

(iii) recognising that the effectiveness of aids to navigation, life-saving appliances and devices for use in the prevention, detection or extinction of fire is dependent to a large degree on the ability of officers and seamen to use them properly and in the full knowledge of their limitations;

(iv) recognising that lack of such ability may be a contributory cause of casualties at sea;

(v) taking note of the Agreement\(^3\) concluded between the Organization and the governing Body of the International Labour Organisation providing for co-operation between the two Organizations, and, in particular Article 3 of that Agreement;

recommends—

(a) that Contracting Governments should take all practicable steps, if necessary in co-operation with other Contracting Governments, to ensure that the education and training of masters, officers and seamen in the use of aids to navigation, of life-saving appliances and of authorised devices designed for the prevention, detection and extinction of fires or for preventing or alleviating casualties at sea is sufficiently comprehensive, and also that, by supplementary or refresher courses, or by other appropriate means, such education and training is kept up to date and in step with modern technological developments in this field, and

(b) that within their respective spheres of activity the Organization and the International Labour Organisation should co-operate closely with each other and with all interested Governments to the above ends.

40. **Co-ordination of Safety at Sea and in the Air**

The Conference, recognising that it is desirable to co-ordinate activities regarding safety on and over the sea, recommends that the Organization, the International Civil Aviation Organization, the International Telecommunication Union and the World Meteorological Organization should pursue their joint studies on matters regarding the planning and providing of facilities for search and rescue and the dissemination of information concerning these arrangements and in other matters of joint concern to these organizations regarding safety at sea.

41. **Ship-Aircraft Communication**

The Conference, recognising that there is a need for communication between aircraft and ships involved in cases of distress, recommends that the Working Group established

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\(^1\) United Nations, *Treaty Series*, Vol. 40, p. 153; for subsequent actions relating to this Convention, see references in Cumulative Indexes Nos. 1 to 4, as well as Annex A in volumes 401, 413, 429 and 483.

\(^2\) United Nations, *Treaty Series*, Vol. 94, p. 11; for subsequent actions relating to this Convention, see references in Cumulative Indexes Nos. 2, 3 and 4, as well as Annex A in volumes 401, 420, 444, 475 and 495.

by the Organization, the International Civil Aviation Organization, the International Telecommunication Union and the World Meteorological Organization, should give urgent consideration to the best way of establishing such communication.

42. **International Radiotelephone Code**

The Conference, recognising that language difficulties might prejudice the successful communication of distress messages and of search and rescue information and that a short and simple radiotelephone code might materially assist in overcoming these shortcomings in areas where they occur, recommends that:

(a) the Organization should as soon as possible undertake the studies recommended by the Administrative Radio Conference, Geneva, 1959 in paragraphs 2 and 3 of Recommendation No. 22 of that Conference;

(b) in undertaking these studies, the Organization should give priority to consideration of Annex 3 of Recommendation No. 22 of the International Telecommunication Union with a view to its being brought into general use as soon as possible;

(c) in order to assist the Organization in these studies, Contracting Governments should study the code proposed in Annexes 2 and 3 of Recommendation No. 22 of the International Telecommunication Union, carrying out as necessary limited and controlled tests under practical conditions and giving priority to that part of it reproduced in Annex 3, and should report their findings to the Organization as well as to the International Telecommunication Union, as soon as possible; and

(d) in replying to paragraph 1 of Recommendation No. 22, the Organization should report that the present Conference considered that a suitable short and simple radiotelephone code would materially serve the purposes of safety of life at sea and has requested the Organization and Contracting Governments to initiate the action proposed in (a), (b) and (c) above.

43. **Medium Frequency Direction-Finding and Radio Beacons**

The Conference, recognising that medium frequency direction-finding will continue to provide a valuable navigational aid, recommends that the existing systems of radio beacons provided for use in connection with shipborne medium frequency direction-finders should be maintained universally at a standard not below that at present provided, and that in certain areas (notably those where such systems are established) they should be improved and expanded as navigational needs require and opportunity affords.

44. **Electronic Aids to Navigation**

The Conference, recognising that advances in radio technique are of great service to shipping, recommends that:

(a) Contracting Governments should recognise the desirability of adopting new equipment, devices or systems incorporating advanced techniques in electronic aids to navigation which have proved operationally useful or necessary in the promotion of safe navigation;
(b) Contracting Governments should study all available information concerning the development of electronic systems of position-fixing, with special reference to their suitability for use in their countries and by their countries' ships;

(c) Contracting Governments should ensure that in the selection of systems of navigational aids for aircraft and ships due weight is given to the relative advantages of the various systems from both points of view, and that when systems are selected which can serve the needs of both ships and aircraft they should be so organised and operated as to serve those needs as fully as practicable;

(d) Contracting Governments should participate in the regular exchange of information on the whole subject of electronic aids to navigation and should bring to the notice of the Organization any operational requirements or technical developments or applications of technical developments the study of which might further the interests of safety of life at sea, and in so doing, should furnish such data as would assist any study which the Organization might undertake; and

(e) the Organization should regard the subject of electronic navigational aids as one of fundamental importance for increasing the safety of navigation, should initiate or pursue such special studies of various aspects of the problem as may seem necessary or desirable, and should undertake the co-ordination and distribution of the information in this field referred to in paragraph (d) above.

45. Radar

1. The Conference, recognising:

(i) that shipborne radar equipments are used increasingly in poor visibility to obtain early warning of the presence of other vessels, of obstructions to navigation and of navigational features; and to measure their ranges and bearings; and as an aid to determining the past behaviour of other vessels;

(ii) that it is highly desirable that such equipments should be capable of providing the information necessary to the performance of all these functions in all conditions of weather or sea which a vessel might reasonably expect to encounter, and at ranges great enough to permit such appropriate action to be taken as will contribute to the safety of navigation; and that they should give a sure and positive indication if the overall performance has been reduced;

(iii) that shipborne radar equipments whose standards of operational performance are inadequate might prejudice safe navigation;

(iv) that there may be considerable advantage in securing uniformity in the ranges of view offered by all shipborne radar so that pilots and navigating officers may quickly familiarise themselves with the equipment fitted on any ship in which they may be employed;

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(v) that all the potentialities of a general purpose shipborne radar can be realised to the full only if facilities exist to enable its information to be displayed stabilised in azimuth;

Recommends that:

(a) Contracting Governments should encourage the installation, on vessels to which Chapter I of the present Convention applies, of shipborne radar conforming to operational standards not inferior to those shown in the Schedule of Performance Standards appended below;

(b) that Contracting Governments should encourage the provision of azimuth stabilisation facilities in shipborne radar; and

(c) the Organization should consider the extent to which uniformity in the ranges of view of shipborne radar could be achieved internationally.

Schedule of Performance Standards

A.—Effective Range

In a ship which is rolling 10° each way the equipment should display clearly:

(i) A vessel of 5,000 tons gross tonnage at a range of 7 nautical miles, whatever her aspect;

(ii) An object such as a lighted navigational buoy at a range of 2 nautical miles, if it has an echoing area of approximately 10 square metres.

The equipment should be capable of displaying the object in (ii) above down to a minimum range of 100 yards (or 92 metres).

Means should be provided of minimising the display of unwanted responses from precipitation and the sea.

B.—Resolution

1. Bearing.—The equipment should display as separate indications two objects at the same range separated by not more than 3° in azimuth.

2. Range.—The equipment should display as separate indications, on the shortest range scale provided, two objects on the same azimuth separated by 75 yards (or 68.25 metres) in range.

C.—Accuracy of Measurement

1. Bearing.—The equipment should offer means of measuring with an error not greater than 2° the bearing of any object at a range of 3/4 nautical mile or more whose echo is displayed. When a plan position indicator display is used, ship’s heading should be represented electronically.

2. Range.—The equipment should offer means of measuring with an error not greater than 6 per cent. of the range of any object at a distance of 3/4 nautical mile or more and whose echo is displayed. The error in measuring ranges less than 3/4 nautical mile should not be greater than 90 yards (or 82 metres).
D.—Durability and Resistance to Effects of Climate

The radar installation should be capable of continued operation under the conditions of vibration, humidity and change of temperature likely to be experienced in the vessel in which it is installed.

E.—Operation

The equipment should be in all respects suitable for operation by the officer of the watch and should be capable of being switched on and operated from the main display position; all controls he will need to use should be accessible and easy to use. Means should be provided of bringing the equipment to a fully operational condition within one minute; a “stand-by” condition may be used provided the equipment can become fully operational within four minutes of first being switched on. The equipment should not be subject to becoming inefficient by reason of a variation from the nominal supply voltage such as might reasonably be expected to occur on the vessel.

F.—Electrical and Magnetic Interference and Mechanical Noise

All steps should be taken to eliminate as far as practicable the causes of, and to suppress, radio interference between the radar equipment and other equipments on board. The radar equipment should be so sited as not to interfere with the efficiency of the compasses.

Mechanical noise from all units should be so limited as not to prejudice the hearing of sounds on which the safety of the ship might depend.

2. The Conference, having in mind the contribution which shipborne radar can make to the safety of navigation at sea, and the fact that incorrect use of such equipment or failure to appreciate its limitations may jeopardise rather than facilitate safe navigation, considers that those using shipborne radar should be competent to do so, and accordingly,

Recommends

(a) that appropriate steps be taken to ensure that:

(i) prior to obtaining full certificated status, all intending deck officers receive suitable instruction in the use of radar and be examined as to their proficiency, and

(ii) all deck officers are encouraged to undergo comparable training in the use of radar and examination as to their proficiency; the objective being that all officers in charge of a watch on radar-equipped vessels will be the holders of appropriate qualifications in the use of shipborne radar;

(b) that such training should include instruction in the capabilities and limitations of radar, the proper operation of radar equipment, the extraction and interpretation of information from it and the ability to recognise when either the reliability of the equipment or the accuracy of the information it gives is affected. The opportunity should be afforded during training of observing radar equipment set up so as to present display conditions similar to those which would be encountered operationally.
3. The Conference, recognising that the size and shape of a small craft or a survival
craft and the material of which it is constructed may to a considerable degree limit the
range at which it can be detected by shipborne radar,

Recommends that Contracting Governments should draw attention to this limitation
and to the existence of such practical means of increasing this range as are available and
should encourage the further development and use of such means.

46. Interference between Shipborne and Airborne Radar

The Conference, noting that Recommendation No. 12 of the Administrative Radio
Conference of the International Telecommunication Union, Geneva, 1959, suggests
that the Organization should study the question of interference between shipborne and
airborne radar in the frequency band 9,300-9,500 Mc/s, endorses that Recommendation
and recommends that the Organization should give this matter urgent attention and in
particular should consider the possibility that frequency planning within the band might
provide an acceptable solution.

47. Merchant Ship Position Reporting

The Conference recommends that Contracting Governments should encourage all
ships to report their positions when travelling in areas where arrangements are made to
collect these positions for search and rescue use. Each Government should arrange that
such messages shall be free of cost to the ship concerned.


The Conference, recognising that an automatic non-directional emergency position-
indicating radio beacon will improve safety of life at sea by greatly facilitating search
and rescue, recommends that Governments should encourage the equipping of all ships
where appropriate with a device of this nature which shall be small, light-weight, floatable,
watertight, shock-resistant, selfenergising and capable of 48 hours' continuous operation.
The Organization should consult with the International Civil Aviation Organization and
the International Telecommunication Union with a view to determining the standard
of world-wide application to which the radio characteristics of that equipment should
conform.

49. Noise on the Bridges of Ships

The Conference, recognising that in the interests of safe navigation the noise level
on the bridges of ships should be kept to a minimum, recommends that studies of this
problem should be made by Contracting Governments with a view to minimising machin-
ery and equipment noise and that the results of these studies should be reported to the
Organization.
50. Disposition of Masthead Lights

The Conference, recognising that there are sailing the high seas vessels whose length and heading cannot always be adequately deduced from the horizontal positioning of their masthead lights, although they comply strictly with the provisions of the International Regulations for Preventing Collisions at Sea, 1 draws the attention of Contracting Governments to the difficulties which may arise therefrom and recommends that Contracting Governments should use their best endeavours, in consultation with shipowners and shipbuilders, to find a solution of these problems with a view to reaching international agreement.

51. Efficiency of Navigation Lights

The Conference, recognising that

(i) the efficiency of the International Regulations for Preventing Collisions at Sea during the hours of darkness in all conditions when the Steering and Sailing Rules apply is dependent upon the ability of a mariner to see and to recognise, at a sufficient range to take appropriate action, the red, green and white lights prescribed in those Regulations, and

(ii) while not regarding the minimum ranges of visibility as defined in those Rules as being inadequate, its freedom to increase those minimum ranges and thereby to provide an additional margin of safety to take account of the increased speeds of vessels is necessarily limited by the need to specify ranges capable of achievement by oil lamps suitable for installation on vessels,

Recommends that the Organization, consulting as necessary with the International Standards Organization and the International Civil Aviation Organization and seeking such other advice as may be appropriate, should collate information concerning transmissivity and chromaticity as they affect ships' navigation lights and if necessary initiate further studies on an international basis.

52. Efficiency of Sound-Signal Apparatus

The Conference, recognising that the efficacy of the International Regulations for Preventing Collisions at Sea is dependent, particularly in conditions of restricted visibility, on the ability of the mariner to hear and to identify the sound signals made by other vessels at a sufficient range to take the action prescribed by the Regulations, recommends that Contracting Governments should submit to the Organization such information resulting from investigations into the behaviour of sound-signals in conditions which restrict visibility, or of the comparative efficiency of different types of sound-signal, as will enable the Organization to collate information and, if necessary, initiate further studies on an international basis.

53. International Collision Regulations—Local Special Rules

The Conference, recognising that, whilst the local Rules referred to in Rule 30 of the International Regulations for Preventing Collisions at Sea must necessarily take

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1 See footnote 2, p. 400, and footnote 1, p. 28 of this volume.
into account particular circumstances and conditions prevailing in the waters in which
they apply, such rules should, so far as is practicable, not be confusing to mariners,
recommends that Contracting Governments should endeavour (a) to bring all special
local rules which prescribe lights, shapes and signals for vessels in as near agreement as may
be practicable with those in the International Regulations for Preventing Collisions at
Sea; and (b) the Organization should initiate a study into the possibility of achieving
further unification of local special rules.

Recommendations Concerning the Convention Provisions Relating to
the Carriage of Grain, Ore and Bulk Cargoes (Chapter VI)

54. Strength of Grain Fittings

The Conference, recognising the need for international agreement on all aspects of
the safe carriage by sea of bulk grain, recommends that Governments submit to the Organization
details of their practices with a view to the dissemination of information and the ultimate international standardisation of the requirements for the strength of fittings required to prevent the shifting of bulk grain cargoes. The Conference further draws attention to the agreement reached at Ottawa in 1950 between Australia, Canada, the United Kingdom and the United States of America and recommends that until such time as international agreement can be reached the constructional details decided upon in Ottawa should guide Administrations in their approval of grain loading plans.

55. Carriage of Bulk Cargoes other than Grain

The Conference, recognising the need for adequate safety precautions to be taken
in the carriage by sea of bulk cargoes other than grain, and considering that the great
variety of types of bulk cargoes, of vessels used for their carriage, and of the conditions of
voyages shows the need for flexibility and prevents the adoption of regulations on this
complex problem, recommends that Contracting Governments ensure, by means of the issue of advice to owners and masters and by administrative supervision of the precautions taken in the stowage of such cargoes, that the necessary good practices in loading and stowage are maintained. The Conference further draws attention to the manual on this subject, issued in 1959 by the National Cargo Bureau of the United States of America at the request of the United States Coast Guard, and recommends that Contracting Governments should inform the Organization of their practices in order that the latter may initiate further study with a view to the formulation of internationally accepted practices on this subject.
Recommendation Concerning the Convention Provisions Relating to the Carriage of Dangerous Goods (Chapter VII)

56. The Conference—

noting that the Economic and Social Council of the United Nations in its Resolution 645 G (XXIII) of 26 April, 1957,¹ and 724 C (XXVIII) of 17 July, 1959,² has approved the Reports of Committees of Experts on the classification, labelling and documentation of dangerous goods whether carried by sea, road, rail or air;

congratulating the Committees of Experts for the work which they have performed in this respect, and desiring to assist the Economic and Social Council to promote a universal code covering matters relating to the carriage of dangerous goods by all forms of transport; and

noting that the Organization has asked for an expression of views by the Conference on the steps which the Organization should take both to give effect to the Resolutions of the Economic and Social Council and to bring about international uniformity in relation to the carriage of dangerous goods,

recommends that

(a) Contracting Governments should adopt a unified international code for the carriage of dangerous goods by sea; and
(b) the Organization should pursue its studies, in co-operation with the Committee of Experts, on such an international code, especially in respect of the classification, description, labelling and the list of dangerous goods and the shipping documents therefor. Any such code proposed for international adoption should take into account existing maritime practices and should cover, among other things:

(i) packing;
(ii) container traffic; and
(iii) stowage, with particular reference to the segregation of incompatible substances.