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Treaties and international agreements

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from 1 July 1984 to 11 July 1984

No. 23001

Traités et accords internationaux

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du 1^{er} juillet 1984 au 11 juillet 1984

N° 23001

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MULTILATERAL

International Convention on standards of training, certification and watchkeeping for seafarers, 1978 (with annex). Concluded at London on 7 July 1978

Authentic texts: Chinese, English, French, Russian and Spanish.

Registered by the International Maritime Organization on 11 July 1984.

(For the authentic French, Russian and Spanish texts, see volume 1362.)

十七、本最终议定书文本，包括其附件，用中文、英文、法文、俄文和西班牙文写成原本一份，交政府间海禁协商组织秘书长保存。公约的官方译本将用阿拉伯文和德文译就，并与本最终议定书一起保存。

十八、政府间海禁协商组织秘书长将把本最终议定书连同会议决议的核证无误的付本，本公约正式文本的核证无误的付本和本公约的官方译本，如已译就，按这些政府的愿望，分送应邀派代表出席会议的各国政府。

各国代表签署本最终议定书，以昭信守。

本最终议定书于一九七八年七月七日订于伦敦。

[For signatures affixed to the Final Act, see p. 379 in volume 1362 — Pour les signatures apposées sous l'Acte final, voir p. 379 du volume 1362.]

INTERNATIONAL CONVENTION¹ ON STANDARDS OF TRAINING, CERTIFICATION AND WATCHKEEPING FOR SEAFARERS, 1978

The Parties to this Convention,

Desiring to promote safety of life and property at sea and the protection of the marine environment by establishing in common agreement international standards of training, certification and watchkeeping for seafarers,

Considering that this end may best be achieved by the conclusion of an International Convention on Standards of Training, Certification and Watchkeeping for Seafarers,

Have agreed as follows:

¹ Came into force on 20 April 1984 in respect of the following States, i.e., 12 months after the date on which not less than 25 States, the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant shipping of ships of 100 gross register tons or more, had either signed it definitively or deposited the requisite instruments of ratification, acceptance, approval or accession with the Secretary-General of the International Maritime Organization, in accordance with article XIV (1):

| <i>State</i> | <i>Date of definitive signature (s), or of the deposit of the instrument of ratification, acceptance (A), approval (AA) or accession (a)</i> | <i>State</i> | <i>Date of definitive signature (s), or of the deposit of the instrument of ratification, acceptance (A), approval (AA) or accession (a)</i> |
|---|--|---|--|
| Argentina | 6 October 1982 <i>a</i> | Greece | 22 March 1983 |
| Australia* | 7 November 1983 | Japan | 27 May 1982 <i>a</i> |
| Bahamas | 7 June 1983 <i>a</i> | Liberia | 28 October 1980 |
| Bangladesh | 6 November 1981 <i>a</i> | Libyan Arab Jamahiriya | 10 August 1983 <i>a</i> |
| Belgium | 14 September 1982 | Mexico | 2 February 1982 <i>a</i> |
| Brazil | 17 January 1984 <i>a</i> | Norway | 18 January 1982 |
| Bulgaria | 31 March 1982 <i>a</i> | Peru | 16 July 1982 <i>a</i> |
| China | 8 June 1981 <i>AA</i> | Poland | 27 April 1983 |
| Colombia | 27 July 1981 <i>a</i> | South Africa | 27 July 1983 <i>a</i> |
| Czechoslovakia | 6 May 1981 <i>a</i> | Spain | 21 October 1980 <i>a</i> |
| Denmark* | 20 January 1981 | Sweden | 8 January 1981 |
| Egypt | 22 September 1980 <i>a</i> | Union of Soviet Socialist Re- publics** | 9 October 1979 <i>s</i> |
| Finland | 27 January 1984 | United Arab Emirates | 15 December 1983 <i>a</i> |
| France** | 11 July 1980 <i>AA</i> | United Kingdom of Great Britain and Northern Ire- land*,*** | 28 November 1980 |
| Gabon | 21 January 1982 <i>a</i> | United Republic of Tanzania . | 27 October 1982 <i>a</i> |
| German Democratic Repub- lic** | 5 November 1979 | | |
| Germany, Federal Republic of* | 28 May 1982 | | |

* For the text of the declarations and reservations made upon ratification see p. 374 of volume 1362.

** For the text of the declarations relating to the application of the Convention to Berlin (West), see p. 376 of volume 1362.

Subsequently, the Convention came into force for the following State three months after the deposit of its instrument of accession with the Secretary-General of the International Maritime Organization, in accordance with article XIV (3):

| <i>State</i> | <i>Date of deposit of the instrument of accession (a)</i> |
|---------------------------------|---|
| Philippines | 22 February 1984 <i>a</i> |
| (With effect from 22 May 1984.) | |

Article I. GENERAL OBLIGATIONS UNDER THE CONVENTION

(1) The Parties undertake to give effect to the provisions of the Convention and the Annex thereto, which shall constitute an integral part of the Convention. Every reference to the Convention constitutes at the same time a reference to the Annex.

(2) The Parties undertake to promulgate all laws, decrees, orders and regulations and to take all other steps which may be necessary to give the Convention full and complete effect, so as to ensure that, from the point of view of safety of life and property at sea and the protection of the marine environment, seafarers on board ships are qualified and fit for their duties.

Article II. DEFINITIONS

For the purpose of the Convention, unless expressly provided otherwise:

(a) "Party" means a State for which the Convention has entered into force.

(b) "Administration" means the Government of the Party whose flag the ship is entitled to fly.

(c) "Certificate" means a valid document, by whatever name it may be known, issued by or under the authority of the Administration or recognized by the Administration authorizing the holder to serve as stated in this document or as authorized by national regulations.

(d) "Certificated" means properly holding a certificate.

(e) "Organization" means the Inter-Governmental Maritime Consultative Organization (IMCO).¹

(f) "Secretary-General" means the Secretary-General of the Organization.

(g) "Sea-going ship" means a ship other than those which navigate exclusively in inland waters or in waters within, or closely adjacent to, sheltered waters or areas where port regulations apply.

(h) "Fishing vessel" means a vessel used for catching fish, whales, seals, walrus or other living resources of the sea.

(i) "Radio Regulations" means the Radio Regulations annexed to, or regarded as being annexed to, the most recent International Telecommunication Convention² which may be in force at any time.

Article III. APPLICATION

The Convention shall apply to seafarers serving on board sea-going ships entitled to fly the flag of a Party except to those serving on board:

(a) Warships, naval auxiliaries or other ships owned or operated by a State and engaged only on governmental non-commercial service; however, each Party shall ensure by the adoption of appropriate measures not impairing the operations or operational capabilities of such ships owned or operated by it, that the persons serving on board such ships meet the requirements of the Convention so far as is reasonable and practicable;

¹ By an amendment adopted by the Assembly of the Inter-Governmental Maritime Consultative Organization (IMCO) by its resolutions A.358 (IX) of 14 November 1975 and A.371 (X) of 9 November 1977 [rectification of resolution A.358 (IX)], the name of the Organization was changed to "International Maritime Organization (IMO)" with effect from 22 May 1982. See United Nations, *Treaty Series*, vol. 1276, p. 468.

² For the Radio Regulations, see International Telecommunications Union, *Radio Regulations*, Geneva, 1959; for the text of the most recent International Telecommunications Convention concluded at Malaga-Torremolinos in 1973, see United Nations, *Treaty Series*, vol. 1209, p. 32, and vol. 1210, p. 2.

- (b) Fishing vessels;
- (c) Pleasure yachts not engaged in trade; or
- (d) Wooden ships of primitive build.

Article IV. COMMUNICATION OF INFORMATION

(1) The Parties shall communicate as soon as practicable to the Secretary-General:

- (a) The text of laws, decrees, orders, regulations and instruments promulgated on the various matters within the scope of the Convention;
- (b) Full details, where appropriate, of contents and duration of study courses, together with their national examination and other requirements for each certificate issued in compliance with the Convention;
- (c) A sufficient number of specimen certificates issued in compliance with the Convention.

(2) The Secretary-General shall notify all Parties of the receipt of any communication under paragraph (1)(a) and, *inter alia*, for the purposes of Articles IX and X, shall, on request, provide them with any information communicated to him under paragraphs (1)(b) and (c).

Article V. OTHER TREATIES AND INTERPRETATION

(1) All prior treaties, conventions and arrangements relating to standards of training, certification and watchkeeping for seafarers in force between the Parties, shall continue to have full and complete effect during the terms thereof as regards:

- (a) Seafarers to whom this Convention does not apply;
- (b) Seafarers to whom this Convention applies, in respect of matters for which it has not expressly provided.

(2) To the extent, however, that such treaties, conventions or arrangements conflict with the provisions of the Convention, the Parties shall review their commitments under such treaties, conventions and arrangements with a view to ensuring that there is no conflict between these commitments and their obligations under the Convention.

(3) All matters which are not expressly provided for in the Convention remain subject to the legislation of Parties.

(4) Nothing in the Convention shall prejudice the codification and development of the law of the sea by the United Nations Conference on the Law of the Sea convened pursuant to resolution 2750 C(XXV) of the General Assembly of the United Nations,¹ nor the present or future claims and legal views of any State concerning the law of the sea and the nature and extent of coastal and flag State jurisdiction.

Article VI. CERTIFICATES

(1) Certificates for masters, officers or ratings shall be issued to those candidates who, to the satisfaction of the Administration, meet the requirements for service, age, medical fitness, training, qualification and examinations in accordance with the appropriate provisions of the Annex to the Convention.

¹ United Nations, *Official Records of the General Assembly, Twenty-fifth Session, Supplement No. 28 (A/8028)*, p. 26.

(2) Certificates for masters and officers, issued in compliance with this Article, shall be endorsed by the issuing Administration in the form as prescribed in Regulation I/2 of the Annex. If the language used is not English, the endorsement shall include a translation into that language.

Article VII. TRANSITIONAL PROVISIONS

(1) A certificate of competency or of service in a capacity for which the Convention requires a certificate and which before entry into force of the Convention for a Party is issued in accordance with the laws of that Party or the Radio Regulations, shall be recognized as valid for service after entry into force of the Convention for that Party.

(2) After the entry into force of the Convention for a Party, its Administration may continue to issue certificates of competency in accordance with its previous practices for a period not exceeding five years. Such certificates shall be recognized as valid for the purpose of the Convention. During this transitional period such certificates shall be issued only to seafarers who had commenced their sea service before entry into force of the Convention for that Party within the specific ship department to which those certificates relate. The Administration shall ensure that all other candidates for certification shall be examined and certificated in accordance with the Convention.

(3) A Party may, within two years after entry into force of the Convention for that Party, issue a certificate of service to seafarers who hold neither an appropriate certificate under the Convention nor a certificate of competency issued under its laws before entry into force of the Convention for that Party but who have:

- (a) Served in the capacity for which they seek a certificate of service for not less than three years at sea within the last seven years preceding entry into force of the Convention for that Party;
- (b) Produced evidence that they have performed that service satisfactorily;
- (c) Satisfied the Administration as to medical fitness, including eyesight and hearing, taking into account their age at the time of application.

For the purpose of the Convention, a certificate of service issued under this paragraph shall be regarded as the equivalent of a certificate issued under the Convention.

Article VIII. DISPENSATION

(1) In circumstances of exceptional necessity, Administrations, if in their opinion this does not cause danger to persons, property or the environment, may issue a dispensation permitting a specified seafarer to serve in a specified ship for a specified period not exceeding six months in a capacity, other than that of the radio officer or radiotelephone operator, except as provided by the relevant Radio Regulations, for which he does not hold the appropriate certificate, provided that the person to whom the dispensation is issued shall be adequately qualified to fill the vacant post in a safe manner, to the satisfaction of the Administration. However, dispensations shall not be granted to a master or chief engineer officer, except in circumstances of *force majeure* and then only for the shortest possible period.

(2) Any dispensation granted for a post shall be granted only to a person properly certificated to fill the post immediately below. Where certification of the post below is not required by the Convention, a dispensation may be issued to a person whose qualification and experience are, in the opinion of the Administration, of a

clear equivalence to the requirements for the post to be filled, provided that, if such a person holds no appropriate certificate, he shall be required to pass a test accepted by the Administration as demonstrating that such a dispensation may safely be issued. In addition, Administrations shall ensure that the post in question is filled by the holder of an appropriate certificate as soon as possible.

(3) Parties shall, as soon as possible after 1 January of each year, send a report to the Secretary-General giving information of the total number of dispensations in respect of each capacity for which a certificate is required that have been issued during the year to sea-going ships, together with information as to the numbers of those ships above and below 1,600 gross register tons respectively.

Article IX. EQUIVALENTS

(1) The Convention shall not prevent an Administration from retaining or adopting other educational and training arrangements, including those involving sea-going service and shipboard organization especially adapted to technical developments and to special types of ships and trades, provided that the level of sea-going service, knowledge and efficiency as regards navigational and technical handling of ship and cargo ensures a degree of safety at sea and has a preventive effect as regards pollution at least equivalent to the requirements of the Convention.

(2) Details of such arrangements shall be reported as early as practicable to the Secretary-General who shall circulate such particulars to all Parties.

Article X. CONTROL

(1) Ships, except those excluded by Article III, are subject, while in the ports of a Party, to control by officers duly authorized by that Party to verify that all seafarers serving on board who are required to be certificated by the Convention are so certificated or hold an appropriate dispensation. Such certificates shall be accepted unless there are clear grounds for believing that a certificate has been fraudulently obtained or that the holder of a certificate is not the person to whom that certificate was originally issued.

(2) In the event that any deficiencies are found under paragraph (1) or under the procedures specified in Regulation I/4, "Control Procedures", the officer carrying out the control shall forthwith inform, in writing, the master of the ship and the Consul or, in his absence, the nearest diplomatic representative or the maritime authority of the State whose flag the ship is entitled to fly, so that appropriate action may be taken. Such notification shall specify the details of the deficiencies found and the grounds on which the Party determines that these deficiencies pose a danger to persons, property or the environment.

(3) In exercising the control under paragraph (1) if, taking into account the size and type of the ship and the length and nature of the voyage, the deficiencies referred to in paragraph (3) of Regulation I/4 are not corrected and it is determined that this fact poses a danger to persons, property or the environment, the Party carrying out the control shall take steps to ensure that the ship will not sail unless and until these requirements are met to the extent that the danger has been removed. The facts concerning the action taken shall be reported promptly to the Secretary-General.

(4) When exercising control under this Article, all possible efforts shall be made to avoid a ship being unduly detained or delayed. If a ship is so detained or delayed it shall be entitled to compensation for any loss or damage resulting therefrom.

(5) This Article shall be applied as may be necessary to ensure that no more favourable treatment is given to ships entitled to fly the flag of a non-Party than is given to ships entitled to fly the flag of a Party.

Article XI. PROMOTION OF TECHNICAL CO-OPERATION

(1) Parties to the Convention shall promote, in consultation with, and with the assistance of, the Organization, support for those Parties which request technical assistance for:

- (a) Training of administrative and technical personnel;
- (b) Establishment of institutions for the training of seafarers;
- (c) Supply of equipment and facilities for training institutions;
- (d) Development of adequate training programmes, including practical training on sea-going ships; and
- (e) Facilitation of other measures and arrangements to enhance the qualifications of seafarers;

preferably on a national, sub-regional or regional basis, to further the aims and purposes of the Convention, taking into account the special needs of developing countries in this regard.

(2) On its part, the Organization shall pursue the aforesaid efforts, as appropriate, in consultation or association with other international organizations, particularly the International Labour Organisation.

Article XII. AMENDMENTS

(1) The Convention may be amended by either of the following procedures:

- (a) Amendments after consideration within the Organization:
 - (i) Any amendment proposed by a Party shall be submitted to the Secretary-General, who shall then circulate it to all Members of the Organization, all Parties and the Director-General of the International Labour Office at least six months prior to its consideration;
 - (ii) Any amendment so proposed and circulated shall be referred to the Maritime Safety Committee of the Organization for consideration;
 - (iii) Parties, whether or not Members of the Organization, shall be entitled to participate in the proceedings of the Maritime Safety Committee for consideration and adoption of amendments;
 - (iv) Amendments shall be adopted by a two-thirds majority of the Parties present and voting in the Maritime Safety Committee expanded as provided for in sub-paragraph (a)(iii) (hereinafter referred to as the "expanded Maritime Safety Committee") on condition that at least one third of the Parties shall be present at the time of voting;
 - (v) Amendments so adopted shall be communicated by the Secretary-General to all Parties for acceptance;
 - (vi) An amendment to an Article shall be deemed to have been accepted on the date on which it is accepted by two thirds of the Parties;
 - (vii) An amendment to the Annex shall be deemed to have been accepted:
 - 1. At the end of two years from the date on which it is communicated to Parties for acceptance; or

2. At the end of a different period, which shall be not less than one year, if so determined at the time of its adoption by a two-thirds majority of the Parties present and voting in the expanded Maritime Safety Committee; however, the amendments shall be deemed not to have been accepted if within the specified period either more than one third of Parties, or Parties the combined merchant fleets of which constitute not less than fifty per cent of the gross tonnage of the world's merchant shipping of ships of 100 gross register tons or more, notify the Secretary-General that they object to the amendment;
- (viii) An amendment to an Article shall enter into force with respect to those Parties which have accepted it, six months after the date on which it is deemed to have been accepted, and with respect to each Party which accepts it after that date, six months after the date of that Party's acceptance;
- (ix) An amendment to the Annex shall enter into force with respect to all Parties, except those which have objected to the amendment under sub-paragraph (a)(vii) and which have not withdrawn such objections, six months after the date on which it is deemed to have been accepted. Before the date determined for entry into force, any Party may give notice to the Secretary-General that it exempts itself from giving effect to that amendment for a period not longer than one year from the date of its entry into force, or for such longer period as may be determined by a two-thirds majority of the Parties present and voting in the expanded Maritime Safety Committee at the time of the adoption of the amendment; or
- (b) Amendment by a conference:
- (i) Upon the request of a Party concurred in by at least one third of the Parties, the Organization shall convene, in association or consultation with the Director-General of the International Labour Office, a conference of Parties to consider amendments to the Convention;
- (ii) Every amendment adopted by such a conference by a two-thirds majority of the Parties present and voting shall be communicated by the Secretary-General to all Parties for acceptance;
- (iii) Unless the conference decides otherwise, the amendment shall be deemed to have been accepted and shall enter into force in accordance with the procedures specified in sub-paragraphs (a)(vi) and (a)(viii) or sub-paragraphs (a)(vii) and (a)(ix) respectively, provided that references in these sub-paragraphs to the expanded Maritime Safety Committee shall be taken to mean references to the conference.
- (2) Any declaration of acceptance of, or objection to, an amendment or any notice given under paragraph (1)(a)(ix) shall be submitted in writing to the Secretary-General, who shall inform all Parties of any such submission and the date of its receipt.
- (3) The Secretary-General shall inform all Parties of any amendments which enter into force, together with the date on which each such amendment enters into force.

Article XIII. SIGNATURE, RATIFICATION, ACCEPTANCE,
APPROVAL AND ACCESSION

(1) The Convention shall remain open for signature at the Headquarters of the Organization from 1 December 1978 until 30 November 1979 and shall thereafter remain open for accession. Any State may become a Party by:

- (a) Signature without reservation as to ratification, acceptance or approval; or
- (b) Signature subject to ratification, acceptance or approval, followed by ratification, acceptance or approval; or
- (c) Accession.

(2) Ratification, acceptance, approval or accession shall be effected by the deposit of an instrument to that effect with the Secretary-General.

(3) The Secretary-General shall inform all States that have signed the Convention or acceded to it and the Director-General of the International Labour Office of any signature or of the deposit of any instrument of ratification, acceptance, approval or accession and the date of its deposit.

Article XIV. ENTRY INTO FORCE

(1) The Convention shall enter into force twelve months after the date on which not less than twenty-five States, the combined merchant fleets of which constitute not less than fifty per cent of the gross tonnage of the world's merchant shipping of ships of 100 gross register tons or more, have either signed it without reservation as to ratification, acceptance or approval or deposited the requisite instruments of ratification, acceptance, approval or accession in accordance with Article XIII.

(2) The Secretary-General shall inform all States that have signed the Convention or acceded to it of the date on which it enters into force.

(3) Any instrument of ratification, acceptance, approval or accession deposited during the twelve months referred to in paragraph (1) shall take effect on the coming into force of the Convention or three months after the deposit of such instrument, whichever is the later date.

(4) Any instrument of ratification, acceptance, approval or accession deposited after the date on which the Convention enters into force shall take effect three months after the date of deposit.

(5) After the date on which an amendment is deemed to have been accepted under Article XII, any instrument of ratification, acceptance, approval or accession deposited shall apply to the Convention as amended.

Article XV. DENUNCIATION

(1) The Convention may be denounced by any Party at any time after five years from the date on which the Convention entered into force for that Party.

(2) Denunciation shall be effected by notification in writing to the Secretary-General who shall inform all other Parties and the Director-General of the International Labour Office of any such notification received and of the date of its receipt as well as the date on which such denunciation takes effect.

(3) A denunciation shall take effect twelve months after receipt of the notification of denunciation by the Secretary-General or after any longer period which may be indicated in the notification.

Article XVI. DEPOSIT AND REGISTRATION

(1) The Convention shall be deposited with the Secretary-General who shall transmit certified true copies thereof to all States that have signed the Convention or acceded to it.

(2) As soon as the Convention enters into force, the Secretary-General shall transmit the text to the Secretary-General of the United Nations for registration and publication, in accordance with Article 102 of the Charter of the United Nations.

Article XVII. LANGUAGES

The Convention is established in a single copy in the Chinese, English, French, Russian and Spanish languages, each text being equally authentic. Official translations in the Arabic and German languages shall be prepared and deposited with the signed original.

IN WITNESS WHEREOF the undersigned, being duly authorized by their respective Governments for that purpose, have signed the Convention.

DONE at London this seventh day of July, one thousand nine hundred and seventy-eight.

[*For signatures affixed to the Convention, see p. 256 in volume 1362.*]

ANNEX

CHAPTER I. GENERAL PROVISIONS

Regulation I/1. DEFINITIONS

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

- (a) "Regulations" means Regulations contained in the Annex to the Convention.
- (b) "Approved" means approved by the Administration.
- (c) "Master" means the person having command of a ship.
- (d) "Officer" means a member of the crew, other than the master, designated as such by national law or regulations or in the absence of such designation by collective agreement or custom.
- (e) "Deck officer" means a qualified officer in the deck department.
- (f) "Chief mate" means the deck officer next in rank to the master and upon whom the command of the ship will fall in event of the incapacity of the master.
- (g) "Engineer officer" means a qualified officer in the engine department.
- (h) "Chief engineer officer" means the senior engineer officer, responsible for the mechanical propulsion of the ship.
- (i) "Second engineer officer" means the engineer officer next in rank to the chief engineer officer and upon whom the responsibility for the mechanical propulsion of the ship will fall in the event of the incapacity of the chief engineer officer.
- (j) "Assistant engineer officer" means a person under training to become an engineer officer and designated as such by national law or regulations.
- (k) "Radio officer" means a person holding a first class or second class radiotelegraph operator's certificate or a radiocommunication operator's general certificate for the maritime mobile service issued under the provisions of the Radio Regulations, who is employed in the radiotelegraph station of a ship which is required to have such a station by the International Convention for the Safety of Life at Sea.
- (l) "Radiotelephone operator" means a person holding an appropriate certificate issued under the provisions of the Radio Regulations.
- (m) "Rating" means a member of the ship's crew other than the master or an officer.
- (n) "Near-coastal voyages" means voyages in the vicinity of a Party as defined by that Party.
- (o) "Propulsion power" means the power in kilowatts which appears on the ship's Certificate of Registry or other official document.*
- (p) "Radio duties" include, as appropriate, watchkeeping and technical maintenance and repairs in accordance with the Radio Regulations, the International Convention for the Safety of Life at Sea and, at the discretion of each Administration, the relevant IMCO recommendations.
- (q) "Oil tanker" means a ship constructed and used for the carriage of petroleum and petroleum products in bulk.
- (r) "Chemical tanker" means a ship constructed and used for the carriage in bulk of any liquid chemical listed in the IMCO "Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk".
- (s) "Liquefied gas tanker" means a ship constructed and used for the carriage in bulk of any liquefied gas listed in the IMCO "Code for the Construction and Equipment of Ships carrying Liquefied Gases in Bulk".

* It is assumed that the power so appearing on the Certificate of Registry or other official document is the total maximum continuous rated output power of all the ship's main propulsion machinery.

Regulation 1/2. CONTENT OF CERTIFICATES AND FORM OF ENDORSEMENT

- 1. Certificates shall be in the official language or languages of the issuing country. If the language used is not English, the text shall include a translation into that language.
- 2. In respect of radio officers and radiotelephone operators, Administrations may:
 - (a) Include the additional knowledge required by the relevant Regulations of the Annex to the Convention in the examination for the issue of a certificate complying with the Radio Regulations; or
 - (b) Issue a separate certificate indicating that the holder has the additional knowledge required by the Annex to the Convention.
- 3. The form of certificate endorsement required by Article VI of the Convention shall be as follows:

Form of Endorsement of Certificates

ENDORSEMENT OF CERTIFICATES

(Official Seal) (Country)

Issued under the provisions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978

Either* (The Government of (name) certifies
(I, the undersigned certify

that the present Certificate/Certificate No:**, is issued to (full name of person), who has been found duly qualified in accordance with the provisions of Regulation of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as*** with the following limitations only:

Insert here)
limitations)
or "none" as)
appropriate.)

Date of issue of this endorsement:

(Official Seal) Signed
(Name and signature of duly authorized official)

Date of birth of the holder of the Certificate:

Signature of the holder of the Certificate:

* Use one line or the other.
** Delete as appropriate.
*** Insert Convention grade or class of Certificate.

Regulation I/3. PRINCIPLES GOVERNING NEAR-COASTAL VOYAGES

1. Any Party defining near-coastal voyages for the purpose of the Convention shall not impose training, experience or certification requirements on the seafarers serving on board the ships entitled to fly the flag of another Party and engaged on such voyages in a manner resulting in more stringent requirements for such seafarers than for seafarers serving on board ships entitled to fly its own flag. In no case shall any such Party impose requirements in respect of seafarers serving on board ships entitled to fly the flag of another Party in excess of those of the Convention in respect of ships not engaged on near-coastal voyages.

2. With respect to ships entitled to fly the flag of a Party regularly engaged on near-coastal voyages off the coast of another Party, the Party whose flag the ship is entitled to fly shall prescribe training, experience and certification requirements for seafarers serving on such ships at least equal to those of the Party off whose coast the ship is engaged, provided that they do not exceed the requirements of the Convention in respect of ships not engaged on near-coastal voyages. A ship which extends its voyage beyond what is defined as a near-coastal voyage by a Party and enters waters not covered by that definition shall fulfil the requirements of the Convention without relaxation under this Regulation.

3. A Party may afford a ship which is entitled to fly its flag the benefits of the near-coastal voyages provisions of the Convention when it is regularly engaged off the coast of a non-Party on near-coastal voyages as defined by the Party.

4. Nothing in this Regulation shall in any way limit the jurisdiction of any State, whether or not a Party to the Convention.

Regulation I/4. CONTROL PROCEDURES

1. Control exercised by a duly authorized control officer under Article X shall be limited to the following:

- (a) Verification in accordance with Article X(1) that all seafarers serving on board who are required to be certificated by the Convention hold a valid certificate or a valid dispensation.
- (b) Assessment of the ability of the seafarers of the ship to maintain watchkeeping standards as required by the Convention if there are grounds for believing that such standards are not being maintained because, while in the port of a Party or in the approaches to that Port, the following have occurred:
 - (i) The ship has been involved in a collision, grounding or stranding; or
 - (ii) There has been a discharge of substances from the ship when underway, at anchor or at berth which is illegal under international conventions; or
 - (iii) The ship has been manoeuvred in an erratic or unsafe manner or navigational course markers or traffic separation schemes have not been followed.

2. The control officer shall provide written information to the master of the ship and the appropriate representative of the flag State according to Article X if, as a result of control action taken in accordance with paragraph 1, any of the following deficiencies are revealed:

- (a) Failure of seafarers, required to hold a certificate, to have an appropriate valid certificate or valid dispensation;
- (b) Failure of navigational or engineering watch arrangements to conform to the requirements specified for the ship by the flag State;
- (c) Absence in a watch of a person qualified to operate equipment essential to safe navigation or the prevention of pollution;
- (d) Inability of the master to provide rested persons for the first watch at the commencement of a voyage and subsequent relieving watches.

3. Failures to correct the deficiencies referred to in paragraph 2(a) — to the extent that they relate to the certificates of the master, chief engineer officer and officers in charge of navigational and engineering watches and, where relevant, the radio officer — and in paragraph 2(b), shall be the only grounds under Article X on which a Party may detain a ship.

CHAPTER II. MASTER, DECK DEPARTMENT

Regulation II/I. BASIC PRINCIPLES TO BE OBSERVED IN KEEPING A NAVIGATIONAL WATCH

1. Parties shall direct the attention of shipowners, ship operators, masters and watch-keeping personnel to the following principles which shall be observed to ensure that a safe navigational watch is maintained at all times.

2. The master of every ship is bound to ensure that watchkeeping arrangements are adequate for maintaining a safe navigational watch. Under the master's general direction, the officers of the watch are responsible for navigating the ship safely during their periods of duty when they will be particularly concerned with avoiding collision and stranding.

3. The basic principles, including but not limited to the following, shall be taken into account on all ships.

4. *Watch arrangements*

(a) The composition of the watch shall at all times be adequate and appropriate to the prevailing circumstances and conditions and shall take into account the need for maintaining a proper look-out.

(b) When deciding the composition of the watch on the bridge which may include appropriate deck ratings, the following factors, *inter alia*, shall be taken into account:

- (i) At no time shall the bridge be left unattended;
- (ii) Weather conditions, visibility and whether there is daylight or darkness;
- (iii) Proximity of navigational hazards which may make it necessary for the officer in charge of the watch to carry out additional navigational duties;
- (iv) Use and operational condition of navigational aids such as radar or electronic position-indicating devices and any other equipment affecting the safe navigation of the ship;
- (v) Whether the ship is fitted with automatic steering;
- (vi) Any unusual demands on the navigational watch that may arise as a result of special operational circumstances.

5. *Fitness for duty.* The watch system shall be such that the efficiency of watchkeeping officers and watchkeeping ratings is not impaired by fatigue. Duties shall be so organized that the first watch at the commencement of a voyage and the subsequent relieving watches are sufficiently rested and otherwise fit for duty.

6. *Navigation*

(a) The intended voyage shall be planned in advance taking into consideration all pertinent information and any course laid down shall be checked before the voyage commences.

(b) During the watch the course steered, position and speed shall be checked at sufficiently frequent intervals, using any available navigational aids necessary, to ensure that the ship follows the planned course.

(c) The officer of the watch shall have full knowledge of the location and operation of all safety and navigational equipment on board the ship and shall be aware and take account of the operating limitations of such equipment.

(d) The officer in charge of a navigational watch shall not be assigned or undertake any duties which would interfere with the safe navigation of the ship.

7. *Navigational equipment*

(a) The officer of the watch shall make the most effective use of all navigational equipment at his disposal.

(b) When using radar, the officer of the watch shall bear in mind the necessity to comply at all times with the provisions on the use of radar contained in the applicable regulations for preventing collisions at sea.

(c) In cases of need the officer of the watch shall not hesitate to use the helm, engines and sound signalling apparatus.

8. *Navigational duties and responsibilities*

(a) The officer in charge of the watch shall:

- (i) Keep his watch on the bridge which he shall in no circumstances leave until properly relieved;
- (ii) Continue to be responsible for the safe navigation of the ship, despite the presence of the master on the bridge, until the master informs him specifically that he has assumed that responsibility and this is mutually understood;
- (iii) Notify the master when in any doubt as to what action to take in the interest of safety;
- (iv) Not hand over the watch to the relieving officer if he has reason to believe that the latter is obviously not capable of carrying out his duties effectively, in which case he shall notify the master accordingly.

(b) On taking over the watch the relieving officer shall satisfy himself as to the ship's estimated or true position and confirm its intended track, course and speed and shall note any dangers to navigation expected to be encountered during his watch.

(c) A proper record shall be kept of the movements and activities during the watch relating to the navigation of the ship.

9. *Look-out.* In addition to maintaining a proper look-out for the purpose of fully appraising the situation and the risk of collision, stranding and other dangers to navigation, the duties of the lookout shall include the detection of ships or aircraft in distress, shipwrecked persons, wrecks and debris. In maintaining a look-out the following shall be observed:

(a) The look-out must be able to give full attention to the keeping of a proper look-out and no other duties shall be undertaken or assigned which could interfere with that task.

(b) The duties of the look-out and helmsman are separate and the helmsman shall not be considered to be the look-out while steering, except in small ships where an unobstructed all-round view is provided at the steering position and there is no impairment of night vision or other impediment to the keeping of a proper look-out. The officer in charge of the watch may be the sole look-out in daylight provided that on each such occasion:

- (i) The situation has been carefully assessed and it has been established without doubt that it is safe to do so;
- (ii) Full account has been taken of all relevant factors including, but not limited to:
 - State of weather,
 - Visibility,
 - Traffic density,
 - Proximity of danger to navigation,
 - The attention necessary when navigating in or near traffic separation schemes;
- (iii) Assistance is immediately available to be summoned to the bridge when any change in the situation so requires.

10. *Navigation with pilot embarked.* Despite the duties and obligations of a pilot, his presence on board does not relieve the master or officer in charge of the watch from their duties and obligations for the safety of the ship. The master and the pilot shall exchange information regarding navigation procedures, local conditions and the ship's characteristics. The master and officer of the watch shall co-operate closely with the pilot and maintain an accurate check of the ship's position and movement.

11. *Protection of the marine environment.* The master and officer in charge of the watch shall be aware of the serious effects of operational or accidental pollution of the marine environment and shall take all possible precautions to prevent such pollution, particularly within the framework of relevant international and port regulations.

Regulation II/2. MANDATORY MINIMUM REQUIREMENTS FOR CERTIFICATION OF MASTERS AND CHIEF MATES OF SHIPS OF 200 GROSS REGISTER TONS OR MORE

Master and chief mate of ships of 1,600 gross register tons or more

1. Every master and chief mate of a sea-going ship of 1,600 gross register tons or more shall hold an appropriate certificate.
2. Every candidate for certification shall:
 - (a) Satisfy the Administration as to medical fitness, particularly regarding eyesight and hearing;
 - (b) Meet the requirements for certification as an officer in charge of a navigational watch on ships of 200 gross register tons or more and have approved sea-going service in that capacity:
 - (i) For certification as chief mate, not less than 18 months; however, this period may be reduced to not less than 12 months if the Administration requires special training which it considers to be equivalent to at least six months' service as officer in charge of a navigational watch;
 - (ii) For certification as master, not less than 36 months; however, this period may be reduced to not less than 24 months if not less than 12 months of such sea-going service has been served as chief mate, or if the Administration requires special training which it considers to be equivalent to such service;
 - (c) Have passed appropriate examination to the satisfaction of the Administration. Such examination shall include the material set out in the Appendix to this Regulation, except that the Administration may vary these examination requirements for masters and chief mates of ships of limited size engaged on near-coastal voyages, as it considers necessary, bearing in mind the effect on the safety of all ships which may be operating in the same waters.

Master and chief mate of ships of between 200 and 1,600 gross register tons

3. Every master and chief mate of a sea-going ship of between 200 and 1,600 gross register tons shall hold an appropriate certificate.
4. Every candidate for certification shall:
 - (a) Satisfy the Administration as to medical fitness, particularly regarding eyesight and hearing;
 - (b)
 - (i) For certification as chief mate, meet the requirements of an officer in charge of a navigational watch on ships of 200 gross register tons or more;
 - (ii) For certification as master, meet the requirements of an officer in charge of a navigational watch on ships of 200 gross register tons or more and have approved sea-

going service in that capacity of not less than 36 months; however, this period may be reduced to not less than 24 months if not less than 12 months of such sea-going service has been served as chief mate, or if the Administration requires special training which it considers to be equivalent to such service;

- (c) Have passed appropriate examination to the satisfaction of the Administration. Such examination shall include the material set out in the Appendix, except that the Administration may vary these examination requirements for masters and chief mates of ships engaged on near-coastal voyages, as it considers appropriate, to exclude such material as is not applicable to the waters or ships concerned, bearing in mind the effect on the safety of all ships which may be operating in the same waters.

General

5. The level of knowledge required under the different headings of the Appendix may be varied according to whether the certificate is being issued at master or chief mate level, and according to whether the certificate or certificates is applicable to ships of 1,600 gross register tons or more, or to ships of between 200 and 1,600 gross register tons.

APPENDIX TO REGULATION II/2. MINIMUM KNOWLEDGE REQUIRED FOR CERTIFICATION OF MASTERS AND CHIEF MATES OF SHIPS OF 200 GROSS REGISTER TONS OR MORE

1. The syllabus given below is compiled for examination of candidates for certification as master or chief mate of ships of 200 gross register tons or more. It is intended to expand and extend in depth the subjects contained in Regulation II/4, "Mandatory Minimum Requirements for Certification of Officers in Charge of a Navigational Watch on Ships of 200 Gross Register Tons or More". Bearing in mind that a master has ultimate responsibility for the safety of the ship, its passengers, crew and cargo, and that a chief mate shall be in a position to assume that responsibility at any time, examination in these subjects shall be designed to test their ability to assimilate all available information that affects the safety of the ship.

2. *Navigation and position determination*

- (a) Voyage planning and navigation for all conditions:
- (i) By acceptable methods of plotting ocean tracks;
 - (ii) Within restricted waters;
 - (iii) In ice;
 - (iv) In restricted visibility;
 - (v) In traffic separation schemes;
 - (vi) In areas of extensive tidal effects.
- (b) Position determination:
- (i) By celestial observations, including the use of sun, stars, moon and planets;
 - (ii) By terrestrial observations, including the ability to use bearings from landmarks and aids to navigation such as lighthouses, beacons and buoys in conjunction with appropriate charts, notices to mariners and other publications to assess the accuracy of the resulting position fix;
 - (iii) Using all modern ship electronic navigational aids to the satisfaction of the Administration, with specific knowledge of their operating principles, limitations, sources of error, detection of misrepresentation of information and methods of correction to obtain accurate position fixing.

3. *Watchkeeping*

- (a) Demonstrate thorough knowledge of content, application and intent of the International Regulations for Preventing Collisions at Sea,¹ including those Annexes concerned with safe navigation;
- (b) Demonstrate knowledge of Regulation II/1, "Basic Principles to Be Observed in Keeping a Navigational Watch".

4. *Radar equipment.* Demonstrate in conjunction with the use of [a] radar simulator or, when not available, [a] manoeuvring board, knowledge of the fundamentals of radar and ability in the operation and use of radar, and in the interpretation and analysis of information obtained from this equipment, including:

- (a) Factors affecting performance and accuracy;
- (b) Setting up and maintaining displays;
- (c) Detection of misrepresentation of information, false echoes, sea return, etc.;
- (d) Range and bearing;
- (e) Identification of critical echoes;
- (f) Course and speed of other ships;
- (g) Time and distance of closest approach of crossing, meeting or overtaking ships;
- (h) Detecting course and speed changes of other ships;
- (i) Effect of changes in own ship's course or speed or both;
- (j) Application of the International Regulations for Preventing Collisions at Sea.

5. *Compasses — magnetic and gyro.* Ability to determine and correct the errors of the magnetic and gyro-compasses and knowledge of the means for correcting such errors.

6. *Meteorology and oceanography*

- (a) Demonstrate the ability to understand and interpret a synoptic chart and to forecast area weather, taking into account local weather conditions;
- (b) Knowledge of the characteristics of various weather systems, including tropical revolving storms and avoidance of storm centres and the dangerous quadrants;
- (c) Knowledge of ocean current systems;
- (d) Ability to use all appropriate navigational publications on tides and currents, including those in the English language;
- (e) Ability to calculate tidal conditions.

7. *Ship manoeuvring and handling.* Manoeuvring and handling of a ship in all conditions, including the following:

- (a) Manoeuvres when approaching pilot vessels or stations with due regard to weather, tide, headreach and stopping distances;
- (b) Handling a ship in rivers, estuaries, etc., having regard to the effects of current, wind and restricted water on the response to the helm;
- (c) Manoeuvring in shallow water, including the reduction in keel clearance due to the effect of squat,* rolling and pitching;
- (d) Interaction between passing ships and between own ship and nearby banks (canal effect);
- (e) Berthing and unberthing under various conditions of wind and tide with and without tugs;

* *Squat.* The decrease in clearance beneath a ship which occurs when the ship moves through the water and is caused both by bodily sinkage and by change of trim. The effect is accentuated in shallow water and is reduced with a reduction in ship's speed.

¹ See "Convention on the International Regulations for Preventing Collisions at Sea, 1972", United Nations, *Treaty Series*, vol. 1050, p. 16.

- (f) Choice of anchorage; anchoring with one or two anchors in limited anchorages and factors involved in determining the length of anchor cable to be used;
- (g) Dragging; clearing fouled anchors;
- (h) Dry-docking, both with and without damage;
- (i) Management and handling of ships in heavy weather, including assisting a ship or aircraft in distress, towing operations, means of keeping an unmanageable ship out of a sea trough, lessening drift and use of oil;
- (j) Precautions in manoeuvring for launching boats or liferafts in bad weather;
- (k) Methods of taking on board survivors from lifeboats or liferafts;
- (l) Ability to determine the manoeuvring and engine characteristics of major types of ships with special reference to stopping distances and turning circles at various draughts and speeds;
- (m) The importance of navigating at reduced speed to avoid damage caused by own ship's bow or stern wave;
- (n) Practical measures to be taken when navigating in ice or conditions of ice accumulation on board;
- (o) The use of, and manoeuvring in, traffic separation schemes.

8. *Ship stability, * construction and damage control*

- (a) Understanding fundamental principles of ship construction and the theories and factors affecting trim and stability and measures necessary to preserve safe trim and stability;
- (b) Knowledge of the effect on trim and stability of a ship in the event of damage to and consequent flooding of a compartment and counter measures to be taken;
- (c) Demonstrate use of stability, trim and stress tables, diagrams and stress calculating equipment, including knowledge of loading cargoes and ballasting in order to keep hull stresses within acceptable limits;
- (d) General knowledge of the principal structural members of a ship and the proper names of the various parts;
- (e) Knowledge of IMCO recommendations concerning ship stability.

9. *Ship power plants*

- (a) Operating principles of marine power plants;
- (b) Ships' auxiliary machinery;
- (c) General knowledge of marine engineering terms.

10. *Cargo handling and stowage*

- (a) The stowage and securing of cargoes on board ships, including cargo gear;
- (b) Loading and discharging operations, with special regard to loading and discharging of heavy weights;
- (c) International regulations and recommendations relating to the carriage of cargoes, in particular the International Maritime Dangerous Goods Code (IMDG);
- (d) Carriage of dangerous goods; precautions to be taken during loading and discharging operations and the care of dangerous goods during a voyage;
- (e) Working knowledge of contents and application of current relevant tanker safety guides;
- (f) Working knowledge of commonly used cargo piping and pumping arrangements;
- (g) Terms and definitions used to describe properties of common oil cargoes, such as crude oil, middle distillates, naphtha;

* Masters and chief mates serving on small ships shall be fully acquainted with the basic stability requirements of such ships.

- (h) Pollution regulations; ballasting, tank cleaning and gas freeing operations;
- (i) Load-on-top procedures.

11. *Fire prevention and fire-fighting appliances*

- (a) Organization of fire drills;
- (b) Classes and chemistry of fire;
- (c) Fire-fighting systems;
- (d) Attendance at an approved fire-fighting course;
- (e) Knowledge of regulations concerning fire-fighting equipment.

12. *Emergency procedures*

- (a) Precautions when beaching a ship;
- (b) Action to be taken prior to, and after, grounding;
- (c) Floating a grounded ship, with and without assistance;
- (d) Action to be taken following a collision;
- (e) Temporary plugging of leaks;
- (f) Measures for the protection and safety of passengers and crew in emergencies;
- (g) Limiting damage and salvaging the ship following a fire or explosion;
- (h) Abandoning ship;
- (i) Emergency steering, rigging and use of jury steering and the means of rigging a jury rudder, where practicable;
- (j) Rescuing persons from a ship in distress or from a wreck;
- (k) Man-overboard procedures.

13. *Medical care.* A thorough knowledge of the use of the contents of the following publications:

- (a) International Medical Guide for Ships or equivalent national publications;
- (b) Medical section of the International Code of Signals;
- (c) Medical First Aid Guide for Use in Accidents Involving Dangerous Goods.

14. *Maritime law*

- (a) A knowledge of international maritime law as embodied in international agreements and conventions as they affect the specific obligations and responsibilities of the master, particularly those concerning safety and the protection of the marine environment. Regard shall be paid especially to the following subjects:
 - (i) Certificates and other documents required to be carried on board ships by international conventions, how they may be obtained and the period of their legal validity;
 - (ii) Responsibilities under the relevant requirements of the International Convention on Load Lines;¹
 - (iii) Responsibilities under the relevant requirements of the International Convention for the Safety of Life at Sea;²
 - (iv) Responsibilities under international conventions for the prevention of pollution from ships;
 - (v) Maritime declarations of health; the requirements of the International Health Regulations;³

¹ United Nations, *Treaty Series*, vol. 640, p. 133.

² *Ibid.*, vol. 1184, p. 2, and vol. 1185, p. 2.

³ *Ibid.*, vol. 764, p. 3, vol. 943, p. 428, and vol. 1286, p. 390.

- (vi) Responsibilities under the Convention on the International Regulations for Preventing Collisions at Sea;
 - (vii) Responsibilities under other international instruments affecting the safety of the ship, passengers, crew and cargo.
- (b) The extent of knowledge of national maritime legislation is left to the discretion of the Administration but shall include national arrangements for implementing international agreements and conventions.

15. *Personnel management and training responsibilities.* A knowledge of personnel management, organization and training aboard ships.

16. *Communications*

- (a) Ability to transmit and receive messages by morse light and to use the International Code of Signals; where the Administration has examined candidates in these subjects at the lower levels of certification, they may have the option of not re-examining in these subjects for certification as master;
- (b) Knowledge of procedures used in radiotelephone communications and ability to use radiotelephones, in particular with respect to distress, urgency, safety and navigational messages;
- (c) A knowledge of the procedures for emergency distress signals by radiotelegraphy as prescribed in the Radio Regulations.

17. *Life-saving.* A thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea), organization of abandon ship drills, lifeboats, liferafts and other life-saving equipment.

18. *Search and rescue.* A thorough knowledge of the IMCO Merchant Ship Search and Rescue Manual (MERSAR).

19. *Methods for demonstration of proficiency*

- (a) *Navigation.* Demonstrate the use of sextant, pelorus, azimuth mirror and ability to plot position, course, bearings.
- (b) *International Regulations for Preventing Collisions at Sea*
 - (i) Use of small models displaying proper signals or lights, or navigation light simulator;
 - (ii) Manoeuvring board or radar simulator.
- (c) *Radar*
 - (i) Radar simulator; or
 - (ii) Manoeuvring boards.
- (d) *Fire-fighting.* Attendance at an approved fire-fighting course.
- (e) *Communications.* Visual and vocal practical test.
- (f) *Life-saving.* Launching and handling of lifeboats and other life-saving appliances, including the donning of life-jackets.

Regulation II/3. MANDATORY MINIMUM REQUIREMENTS FOR CERTIFICATION OF OFFICERS IN CHARGE OF A NAVIGATIONAL WATCH AND OF MASTERS OF SHIPS OF LESS THAN 200 GROSS REGISTER TONS

1. *Ships not engaged on near-coastal voyages*

(a) Every master serving on a sea-going ship of less than 200 gross register tons not engaged on near-coastal voyages shall hold a certificate recognized by the Administration for service as master of ships of between 200 and 1,600 gross register tons.

(b) Every officer in charge of a navigational watch serving on a sea-going ship of less than 200 gross register tons not engaged on near-coastal voyages shall hold an appropriate certificate for ships of 200 gross register tons or more.

2. *Ships engaged on near-coastal voyages*

(a) *Master*

(i) Every master serving in a sea-going ship of less than 200 gross register tons engaged on near-coastal voyages shall hold an appropriate certificate.

(ii) Every candidate for certification shall:

- (1) Be not less than 20 years of age;
- (2) Have approved sea-going service of not less than 12 months as officer in charge of a navigational watch;
- (3) Satisfy the Administration that he possesses adequate knowledge appropriate to his duties on the ships concerned which shall include the subjects contained in the Appendix to this Regulation.

(b) *Officer in charge of a navigational watch*

(i) Every officer in charge of a navigational watch on a sea-going ship of less than 200 gross register tons engaged on near-coastal voyages shall hold an appropriate certificate.

(ii) Every candidate for certification shall:

- (1) Be not less than 18 years of age;
- (2) Satisfy the Administration as to medical fitness, particularly regarding eyesight and hearing;
- (3) Satisfy the Administration that he has:
 - Successfully undergone special training, including an adequate period of appropriate sea-going service as required by the Administration; or
 - Completed approved sea-going service in the deck department of not less than three years;
- (4) Satisfy the Administration that he possesses adequate knowledge appropriate to his duties on the ships concerned, which shall include the subjects contained in the Appendix.

3. *Training.* Training to achieve the necessary knowledge and practical experience shall be based on Regulation II/1, "Basic Principles to Be Observed in Keeping a Navigational Watch", and relevant international regulations and recommendations.

4. *Exemptions.* The Administration, if it considers that a ship's size and the conditions of its voyage are such as to render the application of the full requirements of this Regulation and its Appendix unreasonable or impracticable, may to that extent exempt the master and the officer in charge of a navigational watch on such a ship or class of ships from some of the requirements, bearing in mind the safety of all ships which may be operating in the same waters.

APPENDIX TO REGULATION II/3. MINIMUM KNOWLEDGE REQUIRED FOR CERTIFICATION OF OFFICERS IN CHARGE OF A NAVIGATIONAL WATCH AND OF MASTERS OF SHIPS OF LESS THAN 200 GROSS REGISTER TONS

1. (a) Knowledge of the following:

- (i) Coastal navigation and, to the extent required, celestial navigation;
- (ii) International Regulations for Preventing Collisions at Sea;
- (iii) International Maritime Dangerous Goods Code (IMDG);
- (iv) Magnetic compass;
- (v) Radiotelephony and visual signalling;
- (vi) Fire prevention and fire-fighting appliances;
- (vii) Life-saving;

- (viii) Emergency procedures;
- (ix) Ship manœuvring;
- (x) Ship stability;
- (xi) Meteorology;
- (xii) Small ship power plants;
- (xiii) First aid;
- (xiv) Search and rescue;
- (xv) Prevention of pollution of the marine environment.

(b) In addition to the requirements of sub-paragraph (a), sufficient knowledge to operate safely all navigational aids and equipment fitted aboard the ships concerned.

(c) The level of knowledge to be required in the subjects specified in sub-paragraphs (a) and (b) shall be sufficient for the officer of the watch to carry out his duties safely.

2. Every master serving on a sea-going ship of less than 200 gross register tons shall, in addition to the requirements of paragraph 1 above, satisfy the Administration that he possesses the knowledge to carry out all the duties of such a master safely.

Regulation II/4. MANDATORY MINIMUM REQUIREMENTS FOR CERTIFICATION OF OFFICERS IN CHARGE OF A NAVIGATIONAL WATCH ON SHIPS OF 200 GROSS REGISTER TONS OR MORE

1. Every officer in charge of a navigational watch serving on a sea-going ship of 200 gross register tons or more shall hold an appropriate certificate.

2. Every candidate for certification shall:

- (a) Be not less than 18 years of age;
- (b) Satisfy the Administration as to medical fitness, particularly regarding eyesight and hearing;
- (c) Have approved sea-going service in the deck department of not less than three years which shall include at least six months of bridge watchkeeping duties under the supervision of a qualified officer; however, an Administration may allow the substitution of a period of special training for not more than two years of this approved sea-going service, provided the Administration is satisfied that such training is at least equivalent in value to the period of sea-going service it replaces;
- (d) Satisfy the Administration by passing an appropriate examination that he possesses adequate theoretical and practical knowledge appropriate to his duties.

3. *Certificates for service without restriction.* For issue of certificates for service without restriction as to area of operation, the examination shall test the adequacy of the candidate's theoretical and practical knowledge in the subjects shown in the Appendix to this Regulation.

4. *Restricted certificates.* For issue of restricted certificates for service on near-coastal voyages, the Administration may omit the following subjects from those shown in the Appendix, bearing in mind the effect on the safety of all ships which may be operating in the same waters:

- (a) Celestial navigation;
- (b) Electronic systems of position fixing and navigation for waters not covered by such systems.

5. *Level of knowledge*

(a) The level of knowledge to be required in the subjects shown in the Appendix shall be sufficient for the officer of the watch to carry out his watchkeeping duties safely. In determining the appropriate level of knowledge the Administration shall take into account the remarks under each subject in the Appendix.

(b) Training to achieve the necessary theoretical knowledge and practical experience shall be based on Regulation II/1, “Basic Principles to Be Observed in Keeping a Navigational Watch”, and relevant international regulations and recommendations.

APPENDIX TO REGULATION II/4. MINIMUM KNOWLEDGE REQUIRED FOR CERTIFICATION OF OFFICERS IN CHARGE OF A NAVIGATIONAL WATCH ON SHIPS OF 200 GROSS REGISTER TONS OR MORE

1. *Celestial navigation.* Ability to use celestial bodies to determine the ship’s position and compass errors.

2. *Terrestrial and coastal navigation*

(a) Ability to determine the ship’s position by the use of:

- (i) Landmarks;
- (ii) Aids to navigation, including lighthouses, beacons and buoys;
- (iii) Dead reckoning, taking into account winds, tides, currents and speed by propeller revolutions per minute and by log.

(b) Thorough knowledge of and ability to use navigational charts and publications, such as sailing directions, tide tables, notices to mariners, radio navigational warnings and ships’ routing information.

3. *Radar navigation.* Knowledge of the fundamentals of radar and ability in the operation and use of radar and ability to interpret and analyse information obtained by use of radar including the following:

- (a) Factors affecting performance and accuracy;
- (b) Setting up and maintaining displays;
- (c) Detection of misrepresentation of information, false echoes, sea return, etc.;
- (d) Range and bearing;
- (e) Identification of critical echoes;
- (f) Course and speed of other ships;
- (g) Time and distance of closest approach of crossing, meeting or overtaking ships;
- (h) Detecting course and speed changes of other ships;
- (i) Effect of changes in own ship’s course or speed or both;
- (j) Application of the International Regulations for Preventing Collisions at Sea.

4. *Watchkeeping*

(a) Demonstrate thorough knowledge of content, application and intent of the International Regulations for Preventing Collisions at Sea, including those Annexes concerned with safe navigation;

(b) Demonstrate knowledge of content of Regulation II/1, “Basic Principles to Be Observed in Keeping a Navigational Watch”.

5. *Electronic systems of position fixing and navigation.* Ability to determine the ship’s position by the use of electronic navigational aids to the satisfaction of the Administration.

6. *Radio direction-finders’ and echo-sounders.* Ability to operate the equipment and apply the information correctly.

7. *Meteorology.* Knowledge of shipborne meteorological instruments and their application. Knowledge of the characteristics of various weather systems, reporting procedures and recording systems and the ability to apply the meteorological information available.

8. *Compasses — magnetic and gyro.* Knowledge of the principles of magnetic and gyro-compasses including errors and corrections. With regard to gyro-compasses, an understanding of the systems under the control of the master gyro and a knowledge of the operation and care of the main types of gyro-compasses.

9. *Automatic pilot.* Knowledge of automatic pilot systems and procedures.

10. *Radiotelephony and visual signalling*

- (a) Ability to transmit and receive messages by morse light;
- (b) Ability to use the International Code of Signals;
- (c) Knowledge of procedures used in radiotelephone communications and ability to use radiotelephones, in particular with respect to distress, urgency, safety and navigational messages.

11. *Fire prevention and fire-fighting appliances*

- (a) Ability to organize fire drills;
- (b) Knowledge of classes and chemistry of fire;
- (c) Knowledge of fire-fighting systems;
- (d) Attendance at an approved fire-fighting course.

12. *Life-saving.* Ability to organize abandon ship drills and knowledge of the operation of lifeboats, liferafts, buoyant apparatus and similar life-saving appliances along with their equipment, including portable radio apparatus and emergency position-indicating radio beacons (EPIRBs). Knowledge of survival at sea techniques.

13. *Emergency procedures.* Knowledge of the items listed in the appropriate Appendix of the current edition of the ILO/IMCO "Document for Guidance".

14. *Ship manoeuvring and handling.* Knowledge of:

- (a) The effects of various deadweights, draughts, trim, speed and under keel clearance on turning circles and stopping distances;
- (b) Effects of wind and current on ship handling;
- (c) Manoeuvres for the rescue of man-overboard;
- (d) Squat, shallow water and similar effects;
- (e) Proper procedures for anchoring and mooring.

15. *Ship stability*

- (a) Working knowledge and application of stability, trim and stress tables, diagrams and stress calculating equipment.
- (b) Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy.

16. *English language.* Adequate knowledge of the English language enabling the officer to use charts and other nautical publications, to understand meteorological information and messages concerning ship's safety and operation and to express himself clearly in his communications with other ships or coast stations. Ability to understand and use the IMCO Standard Marine Navigational Vocabulary.

17. *Ship construction.* General knowledge of the principal structural members of a ship and the proper names of the various parts.

18. *Cargo handling and stowage.* Knowledge of safe handling and stowage of cargoes and the effect of these factors on the safety of the ship.

19. *Medical aid.* Practical application of medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur on board ship.

20. *Search and rescue.* Knowledge of the IMCO Merchant Ship Search and Rescue Manual (MERSAR).

21. *Prevention of pollution of the marine environment.* Knowledge of the precautions to be observed to prevent pollution of the marine environment.

Regulation II/5. MANDATORY MINIMUM REQUIREMENTS TO ENSURE THE CONTINUED PROFICIENCY AND UP-DATING OF KNOWLEDGE FOR MASTERS AND DECK OFFICERS

1. Every master and every deck officer holding a certificate who is serving at sea or intends to return to sea after a period ashore shall, in order to continue to qualify for sea-going service, be required at regular intervals not exceeding five years to satisfy the Administration as to:

- (a) Medical fitness, particularly regarding eyesight and hearing; and
- (b) Professional competence:
 - (i) By approved sea-going service as master or deck officer of at least one year during the preceding five years; or
 - (ii) By virtue of having performed functions relating to the duties appropriate to the grade of certificate held which are considered to be at least equivalent to the sea-going service required in paragraph 1(b)(i); or
 - (iii) By one of the following:
 - Passing an approved test; or
 - Successfully completing an approved course or courses; or
 - Having completed approved sea-going service as a deck officer for a period of not less than three months in a supernumerary capacity immediately prior to taking up the rank to which he is entitled by virtue of his certificate.

2. The Administration shall, in consultation with those concerned, formulate or promote the formulation of a structure of refresher and up-dating courses, either voluntary or mandatory, as appropriate, for masters and deck officers who are serving at sea, especially for re-entrants to sea-going service. The Administration shall ensure that arrangements are made to enable all persons concerned to attend such courses as appropriate to their experience and duties. Such courses shall be approved by the Administration and include changes in marine technology and relevant international regulations and recommendations concerning the safety of life at sea and the protection of the marine environment.

3. Every master and deck officer shall, for continuing sea-going service on board ships for which special training requirements have been internationally agreed upon, successfully complete an approved relevant training.

4. The Administration shall ensure that the texts of recent changes in international regulations concerning the safety of life at sea and the protection of the marine environment are made available to ships under its jurisdiction.

Regulation II/6. MANDATORY MINIMUM REQUIREMENTS FOR RATINGS FORMING PART OF A NAVIGATIONAL WATCH

1. The minimum requirements for a rating forming part of a navigational watch on a sea-going ship of 200 gross register tons or more are set out in paragraph 2. These requirements are not those for certification of able seamen,* nor, except for ships of limited size, are they minimum requirements for a rating who is to be the sole rating of a navigational watch. Administrations may require additional training and qualifications for a rating who is to be the sole rating of a navigational watch.

2. Every rating forming part of a navigational watch on a sea-going ship of 200 gross register tons or more shall:

- (a) Be not less than 16 years of age;
- (b) Satisfy the Administration as to medical fitness, particularly regarding eyesight and hearing;

* Reference is made to ILO Certification of Able Seamen Convention, 1946¹ or any successive convention.

¹ United Nations, *Treaty Series*, vol. 94, p. 11.

- (c) Satisfy the Administration that he has:
- (i) Completed approved sea-going service, including not less than six months' sea experience associated, in particular, with navigational watchkeeping duties; or
 - (ii) Successfully undergone special training, either pre-sea or aboard ship, including an adequate period of sea-going service as required by the Administration which shall be not less than two months;
- (d) Have experience or training which includes:
- (i) Basic principles of fire-fighting, first aid, personal survival techniques, health hazards and personal safety;
 - (ii) Ability to understand orders and make himself understood by the officer of the watch in matters relevant to his duties;
 - (iii) Ability to steer and comply with helm orders, together with sufficient knowledge of magnetic and gyro-compasses for performance of these duties;
 - (iv) Ability to keep a proper look-out by sight and hearing and report the approximate bearing of a sound signal, light or other object in degrees or points;
 - (v) Familiarity with the change-over from automatic pilot to hand steering and vice-versa;
 - (vi) Knowledge of the use of appropriate internal communication and alarm systems;
 - (vii) Knowledge of pyrotechnic distress signals;
 - (viii) Knowledge of his emergency duties;
 - (ix) Knowledge of shipboard terms and definitions appropriate to his duties.

3. The experience, service or training required by paragraphs 2(c) and (d) may be acquired through performance of duties associated with navigational watchkeeping, but only if such duties are carried out under the direct supervision of the master, officer in charge of the navigational watch or a qualified rating.

4. Administrations shall ensure that an authorized document is issued to every seafarer who by experience or training is qualified in accordance with this Regulation to serve as a rating forming part of a navigational watch, or that his existing document is duly endorsed.

5. A seafarer may be considered by the Administration to have met the requirements of this Regulation if he has served in a relevant capacity in the deck department for a period of not less than one year within the last five years preceding the entry into force of the Convention for that Administration.

*Regulation II/7. BASIC PRINCIPLES TO BE OBSERVED
IN KEEPING A WATCH IN PORT*

1. On any ship safely moored or safely at anchor under normal circumstances in port, the master shall arrange for an appropriate and effective watch to be maintained for the purpose of safety.

2. In organizing the watches note shall be taken of the provisions of the "Recommendation on Principles and Operational Guidance for Deck Officers in Charge of a Watch in Port" and the "Recommendation on Principles and Operational Guidance for Engineer Officers in Charge of an Engineering Watch in Port" adopted by the International Conference on Training and Certification of Seafarers, 1978.

*Regulation II/8. MANDATORY MINIMUM REQUIREMENTS FOR A WATCH IN PORT
ON SHIPS CARRYING HAZARDOUS CARGO*

1. The master of every ship carrying cargo in bulk that is hazardous—whether it is, or may be, explosive, flammable, toxic, health-threatening or environment polluting—shall ensure that a safe deck watch and a safe engineering watch are maintained by the ready availability on board

of a duly qualified officer or officers, and ratings where appropriate, even when the ship is safely moored or safely at anchor in port.

2. The master of every ship carrying hazardous cargo other than in bulk — whether it is, or may be, explosive, flammable, toxic, health-threatening or environment polluting — shall in organizing safe watchkeeping arrangements take full account of the nature, quantity, packing and stowage of the hazardous cargo and of any special conditions on board, afloat and ashore.

3. In organizing the watches full account shall be taken of the “Recommendation on Principles and Operational Guidance for Deck Officers in Charge of a Watch in Port” and the “Recommendation on Principles and Operational Guidance for Engineer Officers in Charge of an Engineering Watch in Port” adopted by the International Conference on Training and Certification of Seafarers, 1978.

CHAPTER III. ENGINE DEPARTMENT

Regulation III/1. BASIC PRINCIPLES TO BE OBSERVED IN KEEPING AN ENGINEERING WATCH

1. Parties shall direct the attention of shipowners, ship operators, masters, chief engineer officers and watchkeeping personnel to the following principles which shall be observed to ensure that a safe engineering watch is maintained at all times.

2. The term “watch” is used in this Regulation to mean either a group of personnel composing the watch or a period of responsibility for an engineer officer during which his physical presence in the machinery space may or may not be required.

3. The basic principles, including but not limited to the following, shall be taken into account on all ships.

4. *General.* (a) The chief engineer officer of every ship is bound, in consultation with the master, to ensure that watchkeeping arrangements are adequate to maintain a safe watch. When deciding the composition of the watch, which may include appropriate engine room ratings, the following criteria, *inter alia*, shall be taken into account:

- (i) Type of ship;
- (ii) Type and condition of the machinery;
- (iii) Special modes of operation dictated by conditions such as weather, ice, contaminated water, shallow water, emergency conditions, damage containment or pollution abatement;
- (iv) Qualifications and experience of the watch;
- (v) Safety of life, ship, cargo and port, and protection of the environment;
- (vi) Observance of international, national and local regulations;
- (vii) Maintaining the normal operations of the ship.

(b) Under the direction of the chief engineer officer, the engineer officer in charge of the watch shall be responsible for the inspection, operation and testing, as required, of all machinery and equipment under his responsibility. The engineer officer in charge of a watch is the chief engineer officer's representative and his primary responsibility, at all times, shall be the safe and efficient operation and up-keep of machinery affecting the safety of the ship.

(c) The chief engineer officer shall, in consultation with the master, determine in advance the needs of the intended voyage, taking into consideration the requirements for fuel, water, lubricants, chemicals, expendable and other spare parts, tools, supplies and any other requirements.

5. *Operation.* (a) The engineer officer in charge of the watch shall ensure that the established watchkeeping arrangements are maintained. Under his general direction engine

room ratings, if forming part of the watch, shall be required to assist in the safe and efficient operation of the propulsion machinery and the auxiliary equipment.

(b) At the commencement of the engineering watch, the current operational parameters and condition of all machinery shall be verified. Any machinery not functioning properly, expected to malfunction or requiring special service, shall be noted along with any action already taken. Plans shall be made for any further action if required.

(c) The engineer officer in charge of the watch shall ensure that the main propulsion plant and auxiliary systems are kept under constant surveillance, inspections are made of the machinery and steering gear spaces at suitable intervals and appropriate action is taken to remedy any malfunction discovered.

(d) When the machinery spaces are in the manned condition, the engineer officer in charge of the watch shall at all times be readily capable of operating the propulsion equipment in response to needs for changes in direction or speed. When the machinery spaces are in the periodic unmanned condition, the designated duty engineer officer in charge of the watch shall be immediately available and on call to attend the machinery spaces.

(e) All bridge orders shall be promptly executed. Changes in direction or speed of the main propulsion unit shall be recorded, except where an Administration determines that the size or characteristics of a particular ship make such recording impracticable. The engineer officer in charge of the watch shall ensure that the main propulsion unit controls, when in the manual mode of operation, are continuously attended under standby or manoeuvring conditions.

(f) The engineer officer in charge of the watch shall not be assigned or undertake any duties which would interfere with his supervisory duty in respect of the main propulsion system and its ancillary equipment and he shall ensure that the main propulsion system and auxiliary equipment are kept under constant surveillance until he is properly relieved.

(g) Due attention shall be paid to the maintenance and support of all machinery, including mechanical, electrical, hydraulic and pneumatic systems, their control apparatus and associated safety equipment, all accommodation service systems equipment and the recording of stores and spare gear usage.

(h) The chief engineer officer shall ensure that the engineer officer in charge of the watch is informed of all preventive maintenance, damage control, or repair operations to be performed during the watch. The engineer officer in charge of the watch shall be responsible for the isolation, by-passing and adjustment of all machinery under his responsibility that is to be worked on, and shall record all work carried out.

(i) Before going off duty, the engineer officer in charge of the watch shall ensure that all events related to the main and auxiliary machinery are suitably recorded.

(j) To avoid any danger to the safety of the ship and its crew, the engineer officer in charge of the watch shall notify the bridge immediately in the event of fire, impending actions in machinery spaces that may cause reduction in ship's speed, imminent steering failure, stoppage of the ship's propulsion system or any alteration in the generation of electric power, or similar threat to safety. This notification, where possible, shall be accomplished before changes are made in order to afford the bridge the maximum available time to take whatever actions are possible to avoid a potential marine casualty.

(k) When the engine room is put in a standby condition, the engineer officer in charge of the watch shall ensure that all machinery and equipment which may be used during manoeuvring is in a state of immediate readiness and that an adequate reserve of power is available for steering gear and other requirements.

6. *Watch requirements.* (a) Every member of the watch shall be familiar with his assigned watchkeeping duties. In addition, every member shall have with respect to that ship:

- (i) Knowledge of the use of appropriate internal communication systems;
- (ii) Knowledge of escape routes from machinery spaces;

- (iii) Knowledge of engine room alarm systems and the ability to distinguish between the various alarms with special reference to the CO₂ alarm;
- (iv) Knowledge of the positions and use of the fire-fighting equipment in the machinery spaces.

(b) The composition of an underway watch shall, at all times, be adequate to ensure the safe operation of all machinery affecting the operation of the ship, in either automated or manual mode and be appropriate to the prevailing circumstances and conditions. To achieve this, the following, *inter alia*, shall be taken into account:

- (i) Adequate supervision, at all times, of machinery affecting the safe operation of the ship;
- (ii) Condition and reliability of any remotely operated propulsion and steering equipment and their controls, control location and the procedures involved in placing them in a manual mode of operation in the event of breakdown or emergency;
- (iii) Location and operation of fixed fire detection, fire extinction or fire containment devices and apparatus;
- (iv) Use and operational condition of auxiliary, standby and emergency equipment affecting the safe navigation, mooring or docking operations of the ship;
- (v) Steps and procedures necessary to maintain the condition of machinery installations in order to ensure their efficient operation during all modes of ship operation;
- (vi) Any other demands on the watch which may arise as a result of special operating circumstances.

(c) At an unsheltered anchorage the chief engineer officer shall consult with the master whether or not to maintain an underway watch.

7. *Fitness for duty.* The watch system shall be such that the efficiency of the watch is not impaired by fatigue. Duties shall be so organized by the chief engineer officer that the first watch at the commencement of a voyage and the subsequent relieving watches are sufficiently rested and otherwise fit for duty.

8. *Protection of the marine environment.* All engineer officers and engine room ratings shall be aware of the serious effects of operational or accidental pollution of the marine environment and shall take all possible precautions to prevent such pollution, particularly within the framework of relevant international and port regulations.

Regulation III/2. MANDATORY MINIMUM REQUIREMENTS FOR CERTIFICATION OF CHIEF ENGINEER OFFICERS AND SECOND ENGINEER OFFICERS OF SHIPS POWERED BY MAIN PROPULSION MACHINERY OF 3,000 kW PROPULSION POWER OR MORE

1. Every chief engineer officer and second engineer officer of a sea-going ship powered by main propulsion machinery of 3,000 kW propulsion power or more shall hold an appropriate certificate.

2. Every candidate for certification shall:

- (a) Satisfy the Administration as to medical fitness, including eyesight and hearing;
- (b) Meet the requirements for certification as an engineer officer in charge of a watch; and
 - (i) For certification as second engineer officer, have not less than 12 months' approved sea-going service as assistant engineer officer or engineer officer;
 - (ii) For certification as chief engineer officer, have not less than 36 months' approved sea-going service of which not less than 12 months shall be served as an engineer officer in a position of responsibility while qualified to serve as second engineer officer;
- (c) Have attended an approved practical fire-fighting course;
- (d) Have passed appropriate examination to the satisfaction of the Administration. Such examination shall include the material set out in the Appendix to this Regulation, except

that the Administration may vary these examination requirements for officers of ships with limited propulsion power that are engaged on near-coastal voyages, as it considers necessary, bearing in mind the effect on the safety of all ships which may be operating in the same waters.

3. Training to achieve the necessary theoretical knowledge and practical experience shall take into account relevant international regulations and recommendations.

4. The level of knowledge required under the different paragraphs of the Appendix may be varied according to whether the certificate is being issued at chief engineer officer or second engineer officer level.

APPENDIX TO REGULATION III/2. MINIMUM KNOWLEDGE REQUIRED FOR CERTIFICATION OF CHIEF ENGINEER OFFICERS AND SECOND ENGINEER OFFICERS OF SHIPS POWERED BY MAIN PROPULSION MACHINERY OF 3,000 kW PROPULSION POWER OR MORE

1. The syllabus given below is compiled for examination of candidates for certification as chief engineer officer or second engineer officer of ships powered by main propulsion machinery of 3,000 kW propulsion power or more. Bearing in mind that a second engineer officer shall be in a position to assume the responsibilities of a chief engineer officer at any time, examination in these subjects shall be designed to test the candidate's ability to assimilate all available information that affects the safe operation of the ship's machinery.

2. With respect to paragraph 4(a) below, the Administration may omit knowledge requirements for types of propulsion machinery other than those machinery installations for which the certificate to be awarded shall be valid. A certificate awarded on such a basis shall not be valid for any category of machinery installation which has been omitted until the engineer officer proves to be competent in these items to the satisfaction of the Administration. Any such limitation shall be stated in the certificate.

3. Every candidate shall possess theoretical knowledge in the following subjects:

- (a) Thermodynamics and heat transmission;
- (b) Mechanics and hydromechanics;
- (c) Operational principles of ships' power installations (diesel, steam and gas turbine) and refrigeration;
- (d) Physical and chemical properties of fuels and lubricants;
- (e) Technology of materials;
- (f) Chemistry and physics of fire and extinguishing agents;
- (g) Marine electrotechnology, electronics and electrical equipment;
- (h) Fundamentals of automation, instrumentation and control systems;
- (i) Naval architecture and ship construction, including damage control.

4. Every candidate shall possess adequate practical knowledge in at least the following subjects:

- (a) Operation and maintenance of:
 - (i) Marine diesel engines;
 - (ii) Marine steam propulsion plant;
 - (iii) Marine gas turbines;
- (b) Operation and maintenance of auxiliary machinery, including pumping and piping systems, auxiliary boiler plant and steering gear systems;
- (c) Operation, testing and maintenance of electrical and control equipment;
- (d) Operation and maintenance of cargo handling equipment and deck machinery;
- (e) Detection of machinery malfunction, location of faults and action to prevent damage;
- (f) Organization of safe maintenance and repair procedures;

- (g) Methods of, and aids for, fire prevention, detection and extinction;
- (h) Methods and aids to prevent pollution of the environment by ships;
- (i) Regulations to be observed to prevent pollution of the marine environment;
- (j) Effects of marine pollution on the environment;
- (k) First aid related to injuries which might be expected in machinery spaces and use of first aid equipment;
- (l) Functions and use of life-saving appliances;
- (m) Methods of damage control;
- (n) Safe working practices.

5. Every candidate shall possess a knowledge of international maritime law embodied in international agreements and conventions as they affect the specific obligations and responsibilities of the engine department, particularly those concerning safety and the protection of the marine environment. The extent of knowledge of national maritime legislation is left to the discretion of the Administration but shall include national arrangements for implementing international agreements and conventions.

6. Every candidate shall possess a knowledge of personnel management, organization and training aboard ships.

Regulation III/3. MANDATORY MINIMUM REQUIREMENTS FOR CERTIFICATION OF CHIEF ENGINEER OFFICERS AND SECOND ENGINEER OFFICERS OF SHIPS POWERED BY MAIN PROPULSION MACHINERY BETWEEN 750 kW AND 3,000 kW PROPULSION POWER

1. Every chief engineer officer and second engineer officer of a sea-going ship powered by main propulsion machinery of between 750 and 3,000 kW propulsion power shall hold an appropriate certificate.

2. Every candidate for certification shall:

- (a) Satisfy the Administration as to medical fitness, including eyesight and hearing;
- (b) Meet the requirements for certification as an engineer officer in charge of a watch; and
 - (i) For certification as second engineer officer, have not less than 12 months' approved sea-going service as assistant engineer officer or engineer officer;
 - (ii) For certification as chief engineer officer, have not less than 24 months' approved sea-going service of which not less than 12 months shall be served while qualified to serve as second engineer officer;
- (c) Have attended an approved practical fire-fighting course;
- (d) Have passed appropriate examination to the satisfaction of the Administration. Such examination shall include the material set out in the Appendix to this Regulation, except that the Administration may vary the requirements for examination and sea-going service for officers of ships engaged on near-coastal voyages, bearing in mind the types of automatic and remotely operated controls with which such ships are fitted and the effect on the safety of all ships which may be operating in the same waters.

3. Training to achieve the necessary theoretical knowledge and practical experience shall take into account relevant international regulations and recommendations.

4. The level of knowledge required under the different paragraphs of the Appendix may be varied according to whether the certificate is being issued at chief engineer officer or second engineer officer level.

5. Every engineer officer who is qualified to serve as second engineer officer of ships powered by main propulsion machinery of 3,000 kW propulsion power or more, may serve as chief engineer officer of ships powered by main propulsion machinery of less than 3,000 kW propulsion power provided that not less than 12 months' approved sea-going service shall have been served as an engineer officer in a position of responsibility.

APPENDIX TO REGULATION III/3. MINIMUM KNOWLEDGE REQUIRED FOR CERTIFICATION OF CHIEF ENGINEER OFFICERS AND SECOND ENGINEER OFFICERS OF SHIPS POWERED BY MAIN PROPULSION MACHINERY OF BETWEEN 750 kW AND 3,000 kW PROPULSION POWER

1. The syllabus given below is compiled for examination of candidates for certification as chief engineer officer or second engineer officer of ships powered by main propulsion machinery of between 750 kW and 3,000 kW propulsion power. Bearing in mind that a second engineer officer shall be in a position to assume the responsibilities of the chief engineer officer at any time, examination in these subjects shall be designed to test the candidate's ability to assimilate all available information that affects the safe operation of the ship's machinery.

2. With respect to paragraphs 3(d) and 4(a) below, the Administration may omit knowledge requirements for types of propulsion machinery other than those machinery installations for which the certificate to be awarded shall be valid. A certificate awarded on such a basis shall not be valid for any category of machinery installation which has been omitted until the engineer officer proves to be competent in these items to the satisfaction of the Administration. Any such limitation shall be stated in the certificate.

3. Every candidate shall possess sufficient elementary theoretical knowledge to understand the basic principles involved in the following subjects:

- (a) Combustion processes;
- (b) Heat transmission;
- (c) Mechanics and hydromechanics;
- (d) (i) Marine diesel engines;
- (ii) Marine steam propulsion plant;
- (iii) Marine gas turbines;
- (e) Steering gear systems;
- (f) Properties of fuels and lubricants;
- (g) Properties of materials;
- (h) Fire-extinguishing agents;
- (i) Marine electrical equipment;
- (j) Automation, instrumentation and control systems;
- (k) Ship construction, including damage control;
- (l) Auxiliary systems.

4. Every candidate shall possess adequate practical knowledge, in at least the following subjects:

- (a) Operation and maintenance of:
 - (i) Marine diesel engines;
 - (ii) Marine steam propulsion plant;
 - (iii) Marine gas turbines;
- (b) Operation and maintenance of auxiliary machinery systems, including steering gear systems;
- (c) Operation, testing and maintenance of electrical and control equipment;
- (d) Operation and maintenance of cargo handling equipment and deck machinery;
- (e) Detection of machinery malfunction, location of faults and action to prevent damage;
- (f) Organization of safe maintenance and repair procedures;
- (g) Methods of, and aids for, fire prevention, detection and extinction;
- (h) Regulations to be observed regarding pollution of the marine environment and methods and aids to prevent such pollution;

- (i) First aid related to injuries which might be expected in machinery spaces and use of first aid equipment;
- (j) Functions and use of life-saving appliances;
- (k) Methods of damage control with specific reference to action to be taken in the event of flooding of sea water into the engine room;
- (l) Safe working practices.

5. Every candidate shall possess a knowledge of international maritime law as embodied in international agreements and conventions as they affect the specific obligations and responsibilities of the engine department, particularly those concerning safety and the protection of the marine environment. The extent of knowledge of national maritime legislation is left to the discretion of the Administration but shall include national arrangements for implementing international agreements and conventions.

6. Every candidate shall possess a knowledge of personnel management, organization and training aboard ships.

Regulation III/4. MANDATORY MINIMUM REQUIREMENTS FOR CERTIFICATION OF ENGINEER OFFICERS IN CHARGE OF A WATCH IN A TRADITIONALLY MANNED ENGINE ROOM OR DESIGNATED DUTY ENGINEER OFFICERS IN A PERIODICALLY UNMANNED ENGINE ROOM

1. Every engineer officer in charge of a watch in a traditionally manned engine room or the designated duty engineer officer in a periodically unmanned engine room on a sea-going ship powered by main propulsion machinery of 750 kW propulsion power or more shall hold an appropriate certificate.

2. Every candidate for certification shall:

- (a) Be not less than 18 years of age;
- (b) Satisfy the Administration as to medical fitness, including eyesight and hearing;
- (c) Have not less than a total of three years approved education or training, relevant to the duties of a marine engineer;
- (d) Have completed an adequate period of sea-going service which may have been included within the period of three years stated in sub-paragraph (c);
- (e) Satisfy the Administration that he has the theoretical and practical knowledge of the operation and maintenance of marine machinery appropriate to the duties of an engineer officer;
- (f) Have attended an approved practical fire-fighting course;
- (g) Have knowledge of safe working practices.

The Administration may vary the requirement of sub-paragraphs (c) and (d) for engineer officers of ships powered by main propulsion machinery of less than 3,000 kW propulsion power engaged on near-coastal voyages, bearing in mind the effect on the safety of all ships which may be operating in the same waters.

3. Every candidate shall have knowledge of the operation and maintenance of main and auxiliary machinery, which shall include knowledge of relevant regulatory requirements and also knowledge of at least the following specific items:

(a) *Watchkeeping routines*

- (i) Duties associated with taking over and accepting a watch;
- (ii) Routine duties undertaken during a watch;
- (iii) Maintenance of the machinery space log book and the significance of readings taken;
- (iv) Duties associated with handing over a watch.

- (b) *Main and auxiliary machinery*
 - (i) Assisting in the preparation of main machinery and preparation of auxiliary machinery for operation;
 - (ii) Operation of steam boilers, including combustion system;
 - (iii) Methods of checking water level in steam boilers and action necessary if water level is abnormal;
 - (iv) Location of common faults of machinery and plant in engine and boiler rooms and action necessary to prevent damage.
- (c) *Pumping systems*
 - (i) Routine pumping operations;
 - (ii) Operation of bilge, ballast and cargo pumping systems.
- (d) *Generating plant.* Preparing, starting, coupling and changing over alternators or generators.
- (e) *Safety and emergency procedures*
 - (i) Safety precautions to be observed during a watch and immediate actions to be taken in the event of a fire or accident, with particular reference to oil systems;
 - (ii) Safe isolation of electrical and other types of plant and equipment required before personnel are permitted to work on such plant and equipment.
- (f) *Anti-pollution procedures.* The precautions to be observed to prevent pollution of the environment by oil, cargo residue, sewage, smoke or other pollutants. The use of pollution prevention equipment, including oily water separators, sludge tank systems and sewage disposal plant.
- (g) *First aid.* Basic first aid related to injuries which might be expected in machinery spaces.

4. Where steam boilers do not form part of a ship's machinery, the Administration may omit the knowledge requirements of paragraphs 3(b)(ii) and (iii). A certificate awarded on such a basis shall not be valid for service on ships in which steam boilers form part of a ship's machinery until the engineer officer proves to be competent in the omitted items to the satisfaction of the Administration. Any such limitations shall be stated in the certificate.

5. The training to achieve the necessary theoretical knowledge and practical experience shall take into account relevant international regulations and recommendations.

*Regulation III/5. MANDATORY MINIMUM REQUIREMENTS TO ENSURE
THE CONTINUED PROFICIENCY AND UP-DATING OF KNOWLEDGE FOR ENGINEER OFFICERS*

1. Every engineer officer holding a certificate who is serving at sea or intends to return to sea after a period ashore shall, in order to continue to qualify for sea-going service in the rank appropriate to his certificate, be required at regular intervals not exceeding five years to satisfy the Administration as to:

- (a) Medical fitness, including eyesight and hearing; and
- (b) Professional competence:
 - (i) By approved service as an engineer officer of at least one year during the preceding five years; or
 - (ii) By virtue of having performed functions relating to the duties appropriate to the grade of certificate held which is considered to be at least equivalent to the sea-going service required in paragraph 1(b)(i); or
 - (iii) By one of the following:
 - Passing an approved test; or
 - Successfully completing an approved course or courses; or

- Having completed approved sea-going service as an engineer officer for a period of not less than three months in a supernumerary capacity, or in a lower rank than that for which he holds the certificate, immediately prior to taking up the rank to which he is entitled by virtue of his certificate.
- 2. The course or courses referred to in paragraph 1(b)(iii) shall include, in particular, changes in the relevant international regulations and recommendations concerning the safety of life at sea and the protection of the marine environment.
- 3. The Administration shall ensure that the texts of recent changes in international regulations concerning the safety of life at sea and the protection of the marine environment are made available to ships under its jurisdiction.

*Regulation III/6. MANDATORY MINIMUM REQUIREMENTS FOR RATINGS
FORMING PART OF AN ENGINE ROOM WATCH*

1. The minimum requirements for a rating if forming part of an engine room watch shall be as set out in paragraph 2. These requirements are not for:
 - (a) A rating nominated as the assistant to the engineer officer in charge of the watch;*
 - (b) A rating who is under training;
 - (c) A rating whose duties while on watch are of an unskilled nature.
2. Every rating forming part of an engine room watch shall:
 - (a) Be not less than 16 years of age;
 - (b) Satisfy the Administration as to medical fitness, including eyesight and hearing;
 - (c) Satisfy the Administration as to:
 - (i) Experience or training regarding fire-fighting, basic first aid, personal survival techniques, health hazards and personal safety;
 - (ii) Ability to understand orders, and make himself understood in matters relevant to his duties;
 - (d) Satisfy the Administration that he has:
 - (i) Shore experience relevant to his sea-going duties supplemented by an adequate period of sea-going service as required by the Administration; or
 - (ii) Undergone special training either pre-sea or on board ship, including an adequate period of sea-going service as required by the Administration; or
 - (iii) Approved sea-going service of at least six months.
3. Every such rating shall have knowledge of:
 - (a) Engine room watchkeeping procedures and the ability to carry out a watch routine appropriate to his duties;
 - (b) Safe working practices as related to engine room operations;
 - (c) Terms used in machinery spaces and names of machinery and equipment relative to his duties;
 - (d) Basic environmental protection procedures.
4. Every rating required to keep a boiler watch shall have knowledge of the safe operation of boilers, and shall have the ability to maintain the correct water levels and steam pressures.
5. Every rating forming part of an engine room watch shall be familiar with his watchkeeping duties in the machinery spaces on the ship on which he is to serve. In particular, with respect to that ship the rating shall have:

* Reference is made to Resolution 9, "Recommendation on Minimum Requirements for a Rating nominated as the Assistant to the Engineer Officer in Charge of the Watch", adopted by the International Conference on Training and Certification of Seafarers, 1978.

- (a) Knowledge of the use of appropriate internal communication systems;
- (b) Knowledge of escape routes from machinery spaces;
- (c) Knowledge of engine room alarm systems and ability to distinguish between the various alarms with special reference to fire-extinguishing gas alarms;
- (d) Familiarity with the location and use of fire-fighting equipment in the machinery spaces.

6. A seafarer may be considered by the Administration to have met the requirements of this Regulation if he has served in a relevant capacity in the engine department for a period of not less than one year within the last five years preceding the entry into force of the Convention for that Administration.

CHAPTER IV. RADIO DEPARTMENT; RADIO WATCHKEEPING AND MAINTENANCE

Explanatory note: Mandatory provisions relating to radio watchkeeping are set forth in the Radio Regulations, and the safety radio watchkeeping and maintenance provisions are set forth in the International Convention for the Safety of Life at Sea and in the Radio Regulations, as these two sets of Regulations may be amended and are in force. Attention is also directed to the relevant resolutions adopted by the International Conference on Training and Certification of Seafarers, 1978.

Regulation IV/1. MANDATORY MINIMUM REQUIREMENTS FOR CERTIFICATION OF RADIO OFFICERS

1. Every radio officer in charge of, or performing, radio duties in a ship shall hold an appropriate certificate or certificates issued or recognized by the Administration under the provisions of the Radio Regulations, and have adequate qualifying service.

2. In addition, a radio officer shall:

- (a) Be not less than 18 years of age;
- (b) Satisfy the Administration as to medical fitness, particularly regarding eyesight, hearing and speech;
- (c) Meet the requirements of the Appendix to this Regulation.

3. Every candidate for a certificate shall be required to pass an examination or examinations to the satisfaction of the Administration concerned.

4. The level of knowledge required for certification shall be sufficient for the radio officer to carry out his radio duties safely and efficiently. In determining the appropriate level of knowledge and the training necessary to achieve that knowledge and practical ability, the Administration shall take into account the requirements of the Radio Regulations and the Appendix to this Regulation. Administrations shall also take into account the relevant resolutions adopted by the International Conference on Training and Certification of Seafarers, 1978, and relevant IMCO recommendations.

APPENDIX TO REGULATION IV/1. MINIMUM ADDITIONAL KNOWLEDGE AND TRAINING REQUIREMENTS FOR RADIO OFFICERS

In addition to satisfying the requirements for the issue of a certificate in compliance with the Radio Regulations, radio officers shall have knowledge and training, including practical training, in the following:

- (a) The provision of radio services in emergencies, including:
 - (i) Abandon ship;
 - (ii) Fire aboard ship;
 - (iii) Partial or full breakdown of the radio station;

- (b) The operation of lifeboats, liferafts, buoyant apparatus and their equipment, with special reference to portable and fixed lifeboat radio apparatus and emergency position-indicating radio beacons;
- (c) Survival at sea;
- (d) First aid;
- (e) Fire prevention and fire-fighting with particular reference to the radio installation;
- (f) Preventive measures for the safety of ship and personnel in connexion with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards;
- (g) The use of the IMCO Merchant Ship Search and Rescue Manual (MERSAR) with particular reference to radiocommunications;
- (h) Ship position-reporting systems and procedures;
- (i) The use of the International Code of Signals and the IMCO Standard Marine Navigational Vocabulary;
- (j) Radio medical systems and procedures.

*Regulation IV/2. MANDATORY MINIMUM REQUIREMENTS TO ENSURE
THE CONTINUED PROFICIENCY AND UP-DATING OF KNOWLEDGE FOR RADIO OFFICERS*

1. Every radio officer holding a certificate or certificates issued or recognized by the Administration shall, in order to continue to qualify for sea-going service, be required to satisfy the Administration as to the following:

- (a) Medical fitness, particularly regarding eyesight, hearing and speech, at regular intervals not exceeding five years; and
- (b) Professional competence:
 - (i) By approved radiocommunications service as a radio officer with no single interruption of service exceeding five years;
 - (ii) Following such interruption, by passing an approved test or successfully completing an approved training course or courses at sea or ashore, which shall include elements that are of direct relevance to the safety of life at sea and modern radiocommunication equipment and may also include radionavigation equipment.

2. When new modes, equipment or practices are being introduced aboard ships entitled to fly its flag, the Administration may require radio officers to pass an approved test or successfully complete an appropriate training course or courses, at sea or ashore, with particular reference to safety duties.

3. Every radio officer shall, to continue to qualify for sea-going service on board particular types of ships for which special training requirements have been internationally agreed upon, successfully complete approved relevant training or examinations which shall take into account relevant international regulations and recommendations.

4. The Administration shall ensure that the texts of recent changes in international regulations relating to radiocommunications and relevant to the safety of life at sea, are available to ships under its jurisdiction.

5. Administrations are encouraged, in consultation with those concerned, to formulate or promote the formulation of a structure of refresher and up-dating courses, either voluntary or mandatory, as appropriate, at sea or ashore, for radio officers who are serving at sea and especially for re-entrants to sea-going service. The course or courses shall include elements that are of direct relevance to radio duties and include changes in marine radiocommunication technology and relevant international regulations and recommendations* concerning the safety of life at sea.

* Including any IMCO recommendations concerning the development of the maritime distress system.

Regulation IV/3. MANDATORY MINIMUM REQUIREMENTS FOR CERTIFICATION OF RADIOTELEPHONE OPERATORS

1. Every radiotelephone operator in charge of, or performing, radio duties in a ship shall hold an appropriate certificate or certificates issued or recognized by the Administration under the provisions of the Radio Regulations.

2. In addition, such radiotelephone operator of a ship which is required to have a radiotelephone station by the International Convention for the Safety of Life at Sea, shall:

- (a) Be not less than 18 years of age;
- (b) Satisfy the Administration as to medical fitness, particularly regarding eyesight, hearing and speech;
- (c) Meet the requirements of the Appendix to this Regulation.

3. Every candidate for a certificate shall be required to pass an examination or examinations to the satisfaction of the Administration concerned.

4. The level of knowledge required for certification shall be sufficient for the radiotelephone operator to carry out his radio duties safely and efficiently. In determining the appropriate level of knowledge and the training necessary to achieve that knowledge and practical ability, the Administration shall take into account the requirements of the Radio Regulations and the Appendix to this Regulation. Administrations shall also take into account the relevant resolutions adopted by the International Conference on Training and Certification of Seafarers, 1978, and relevant IMCO recommendations.

APPENDIX TO REGULATION IV/3. MINIMUM ADDITIONAL KNOWLEDGE AND TRAINING REQUIREMENTS FOR RADIOTELEPHONE OPERATORS

In addition to satisfying the requirements for the issue of a certificate in compliance with the Radio Regulations, radiotelephone operators shall have knowledge and training, including practical training, in the following:

- (a) The provision of radio services in emergencies, including:
 - (i) Abandon ship;
 - (ii) Fire aboard ship;
 - (iii) Partial or full breakdown of the radio station;
- (b) The operation of lifeboats, liferafts, buoyant apparatus and their equipment, with special reference to portable and fixed lifeboat radio apparatus and emergency position-indicating radio beacons;
- (c) Survival at sea;
- (d) First aid;
- (e) Fire prevention and fire-fighting with particular reference to the radio installation;
- (f) Preventive measures for the safety of ship and personnel in connexion with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards;
- (g) The use of the IMCO Merchant Ship Search and Rescue Manual (MERSAR) with particular reference to radiocommunications;
- (h) Ship position-reporting systems and procedures;
- (i) The use of the International Code of Signals and the IMCO Standard Marine Navigational Vocabulary;
- (j) Radio medical systems and procedures.

CHAPTER V. SPECIAL REQUIREMENTS FOR TANKERS

Regulation V/1. MANDATORY MINIMUM REQUIREMENTS FOR THE TRAINING AND QUALIFICATIONS OF MASTERS, OFFICERS AND RATINGS OF OIL TANKERS

1. Officers and ratings who are to have specific duties, and responsibilities related to those duties, in connexion with cargo and cargo equipment on oil tankers and who have not served on board an oil tanker as part of the regular complement, before carrying out such duties shall have completed an appropriate shore-based fire-fighting course; and

- (a) An appropriate period of supervised shipboard service in order to acquire adequate knowledge of safe operational practices; or
- (b) An approved oil tanker familiarization course which includes basic safety and pollution prevention precautions and procedures, layouts of different types of oil tankers, types of cargo, their hazards and their handling equipment, general operational sequence and oil tanker terminology.

2. Masters, chief engineer officers, chief mates, second engineer officers and, if other than the foregoing, any person with the immediate responsibility for loading, discharging and care in transit or handling of cargo, in addition to the provisions of paragraph 1, shall have:

- (a) Relevant experience appropriate to their duties on oil tankers; and
- (b) Completed a specialized training programme appropriate to their duties, including oil tanker safety, fire safety measures and systems, pollution prevention and control, operational practice and obligations under applicable laws and regulations.

3. Within two years after the entry into force of the Convention for a Party, a seafarer may be considered to have met the requirements of paragraph 2(b) if he has served in a relevant capacity on board oil tankers for a period of not less than one year within the preceding five years.

Regulation V/2. MANDATORY MINIMUM REQUIREMENTS FOR THE TRAINING AND QUALIFICATIONS OF MASTERS, OFFICERS AND RATINGS OF CHEMICAL TANKERS

1. Officers and ratings who are to have specific duties, and responsibilities related to those duties, in connexion with cargo and cargo equipment on chemical tankers and who have not served on board a chemical tanker as part of the regular complement, before carrying out such duties shall have completed an appropriate shore-based fire-fighting course; and

- (a) An appropriate period of supervised shipboard service in order to acquire adequate knowledge of safe operational practices; or
- (b) An approved chemical tanker familiarization course which includes basic safety and pollution prevention precautions and procedures, layouts of different types of chemical tankers, types of cargo, their hazards and their handling equipment, general operational sequence and chemical tanker terminology.

2. Masters, chief engineer officers, chief mates, second engineer officers and, if other than the foregoing, any person with the immediate responsibility for loading, discharging and care in transit or handling of cargo, in addition to the provisions of paragraph 1, shall have:

- (a) Relevant experience appropriate to their duties on chemical tankers; and
- (b) Completed a specialized training programme appropriate to their duties including chemical tanker safety, fire safety measures and systems, pollution prevention and control, operational practice and obligations under applicable laws and regulations.

3. Within two years after the entry into force of the Convention for a Party, a seafarer may be considered to have met the requirements of paragraph 2(b) if he has served in a relevant capacity on board chemical tankers for a period of not less than one year within the preceding five years.

Regulation V/3. MANDATORY MINIMUM REQUIREMENTS FOR THE TRAINING AND QUALIFICATIONS OF MASTERS, OFFICERS AND RATINGS OF LIQUEFIED GAS TANKERS

1. Officers and ratings who are to have specific duties, and responsibilities related to those duties, in connexion with cargo and cargo equipment on liquefied gas tankers and who have not served on board a liquefied gas tanker as part of the regular complement, before carrying out such duties shall have completed an appropriate shore-based fire-fighting course; and

- (a) An appropriate period of supervised shipboard service in order to acquire adequate knowledge of safe operational practices; or
- (b) An approved liquefied gas tanker familiarization course which includes basic safety and pollution prevention precautions and procedures, layouts of different types of liquefied gas tankers, types of cargo, their hazards and their handling equipment, general operational sequence and liquefied gas tanker terminology.

2. Masters, chief engineer officers, chief mates, second engineer officers and, if other than the foregoing, any person with the immediate responsibility for loading, discharging and care in transit or handling of cargo, in addition to the provisions of paragraph 1, shall have:

- (a) Relevant experience appropriate to their duties on liquefied gas tankers; and
- (b) Completed a specialized training programme appropriate to their duties including liquefied gas tanker safety, fire safety measures and systems, pollution prevention and control, operational practice and obligations under applicable laws and regulations.

3. Within two years after the entry into force of the Convention for a Party, a seafarer may be considered to have met the requirements of paragraph 2(b) if he has served in a relevant capacity on board liquefied gas tankers for a period of not less than one year within the preceding five years.

CHAPTER VI. PROFICIENCY IN SURVIVAL CRAFT

Regulation VI/1. MANDATORY MINIMUM REQUIREMENTS FOR THE ISSUE OF CERTIFICATES OF PROFICIENCY IN SURVIVAL CRAFT

Every seafarer to be issued with a certificate of proficiency in survival craft shall:

- (a) Be not less than 17 1/2 years of age;
- (b) Satisfy the Administration as to medical fitness;
- (c) Have approved sea-going service of not less than 12 months or have attended an approved training course and have approved sea-going service of not less than nine months;
- (d) Satisfy the Administration by examination or by continuous assessment during an approved training course that he possesses knowledge of the contents of the Appendix to this Regulation;
- (e) Demonstrate to the satisfaction of the Administration by examination or by continuous assessment during an approved training course that he possesses the ability to:
 - (i) Don a life-jacket correctly; safely jump from a height into the water; board a survival craft from the water while wearing a life-jacket;
 - (ii) Right an inverted liferaft while wearing a life-jacket;
 - (iii) Interpret the markings on survival craft with respect to the number of persons they are permitted to carry;
 - (iv) Make the correct commands required for launching and boarding the survival craft, clearing the ship and handling and disembarking from the survival craft;
 - (v) Prepare and launch survival craft safely into the water and clear the ship's side quickly;
 - (vi) Deal with injured persons both during and after abandonment;

- (vii) Row and steer, erect a mast, set the sails, manage a boat under sail and steer a boat by compass;
- (viii) Use signalling equipment, including pyrotechnics;
- (ix) Use portable radio equipment for survival craft.

APPENDIX TO REGULATION VI/1. MINIMUM KNOWLEDGE REQUIRED FOR THE ISSUE
OF CERTIFICATES OF PROFICIENCY IN SURVIVAL CRAFT

1. Types of emergency situations which may occur, such as collisions, fire, foundering.
2. Principles of survival including:
 - (a) Value of training and drills;
 - (b) Need to be ready for any emergency;
 - (c) Actions to be taken when called to survival craft stations;
 - (d) Actions to be taken when required to abandon ship;
 - (e) Actions to be taken when in the water;
 - (f) Actions to be taken when aboard a survival craft;
 - (g) Main dangers to survivors.
3. Special duties assigned to each crew member as indicated in the muster list, including the differences between the signals calling all crew to survival craft and to fire stations.
4. Types of life-saving appliances normally carried on board ships.
5. Construction and outfit of survival craft and individual items of their equipment.
6. Particular characteristics and facilities of survival craft.
7. Various types of devices used for launching survival craft.
8. Methods of launching survival craft into a rough sea.
9. Action to be taken after leaving the ship.
10. Handling survival craft in rough weather.
11. Use of painter, sea anchor and all other equipment.
12. Apportionment of food and water in survival craft.
13. Methods of helicopter rescue.
14. Use of the first aid kit and resuscitation techniques.
15. Radio devices carried in survival craft, including emergency position-indicating radio beacons.
16. Effects of hypothermia and its prevention; use of protective covers and protective garments.
17. Methods of starting and operating a survival craft engine and its accessories together with the use of fire extinguisher provided.
18. Use of emergency boats and motor lifeboats for marshalling liferafts and rescue of survivors and persons in the sea.
19. Beaching a survival craft.

FINAL ACT¹ OF THE INTERNATIONAL CONFERENCE ON TRAINING AND CERTIFICATION OF SEAFARERS, 1978

1. Pursuant to Resolution A.248(VII)² of 15 October 1971 adopted by the Assembly of the Inter-Governmental Maritime Consultative Organization, the Organization convened an International Conference on Training and Certification of Seafarers which was held in London from 14 June to 7 July 1978. The Conference was convened in association with the International Labour Organisation.

2. Upon the invitation of the Inter-Governmental Maritime Consultative Organization the following States were represented by delegations at the Conference:

| | | |
|------------------------------|------------------------|--|
| Algeria | Greece | Philippines |
| Angola | Grenada | Poland |
| Argentina | Holy See | Portugal |
| Australia | India | Qatar |
| Bahrain | Indonesia | Republic of Korea |
| Bangladesh | Iraq | Romania |
| Belgium | Ireland | Saudi Arabia |
| Brazil | Israel | Senegal |
| Canada | Italy | Singapore |
| Cape Verde | Ivory Coast | Somalia |
| Chile | Jamaica | Spain |
| China | Japan | Sudan |
| Colombia | Kenya | Sweden |
| Cuba | Kuwait | Switzerland |
| Cyprus | Liberia | Thailand |
| Czechoslovakia | Libyan Arab Jamahiriya | Trinidad and Tobago |
| Democratic Yemen | Madagascar | Union of Soviet Socialist Republics |
| Denmark | Malaysia | United Kingdom of Great Britain and Northern Ireland |
| Egypt | Mexico | Ireland |
| Finland | Morocco | United Republic of Cameroon |
| France | Netherlands | United States of America |
| German Democratic Republic | New Zealand | Uruguay |
| Germany, Federal Republic of | Nigeria | Yugoslavia |
| Ghana | Norway | |
| | Panama | |
| | Peru | |

3. Fiji was represented at the Conference by an observer.

4. Hong Kong, an Associate Member of the Inter-Governmental Maritime Consultative Organization, sent observers to the Conference.

5. The International Labour Organisation sent to the Conference a tripartite delegation including representatives of Governments, Shipowners and Seafarers. The United Nations Environment Programme was also represented.

¹ Published for information only. The International Maritime Organization, in a communication dated 5 June 1985, informed the Secretary-General that it did not consider the Final Act of the Conference to be an integral part of the International Convention on standards of training, certification and watchkeeping for seafarers, 1978.

² Inter-Governmental Maritime Consultative Organization, *Resolutions and Other Decisions, Seventh Session*, 5-15 October 1971, p. 170.

6. The following inter-governmental organizations sent observers to the Conference:

Commission of the European Communities
League of Arab States

7. The following non-governmental organizations also sent observers to the Conference:

International Chamber of Shipping (ICS)
International Shipping Federation Ltd. (ISF)
International Confederation of Free Trade Unions (ICFTU)
International Radio-Maritime Committee (CIRM)
Oil Companies International Marine Forum (OCIMF)
International Maritime Pilots' Association (IMPA)
International Shipowners' Association (INSA)
Friends of the Earth International (FOE)
International Association of Drilling Contractors (IADC)
International Association of Institutes of Navigation (IAIN)
International Federation of Shipmasters' Associations (IFSMA)
Oil Industry International Exploration & Production Forum (E&P Forum)

8. The following liberation movement recognized by the Organization of African Unity/League of Arab States sent observers to the Conference:

Palestine Liberation Organization (PLO)

9. The Conference was opened by Mr. C. P. Srivastava, Secretary-General of the Inter-Governmental Maritime Consultative Organization. On behalf of Her Majesty's Government in the United Kingdom, Mr. S. Clinton Davis, Parliamentary Under-Secretary of State for Companies, Aviation and Shipping made a statement welcoming the delegates, emphasizing the importance of the Conference and supporting its objectives.

10. The Conference elected Mr. Tage Madsen, Head of the Danish delegation, as President of the Conference.

11. Ten Vice-Presidents of the Conference were elected, as follows:

Captain M. P. Palet (Argentina)
Captain S. A. E. Capanema (Brazil)
Mr. H. Morais (Cape Verde)
Captain G. Haussmann (German Democratic Republic)
Mr. S. Kugblenu (Ghana)
Dr. S. D. Salman Alhashim (Iraq)
Mr. J. Heringa (Netherlands)
H.E. Mr. Phan Wannamethee (Thailand)
Mr. G. Kolesnikov (USSR)
Mr. J. K. Rice-Oxley (United Kingdom)

12. The Secretariat of the Conference consisted of the following officers:

Secretary-General: Mr. C. P. Srivastava, Secretary-General of the Organization

Executive Secretary: Captain G. Kostylev

Deputy Executive Secretary: Captain W. S. G. Morrison

Secretary to the Plenary: Mr. W. de Goede

13. The Conference established the following Committees with officers indicated:

Steering Committee

Chairman: Mr. Tage Madsen (Denmark), President of the Conference

Committee I

Chairman: Mr. J. Vonau (Poland)

Vice-Chairman: The Hon. Mr. G. F. B. Cooper (Liberia)

Committee II

Chairman: Captain P. S. Vanchiswar (India)

Vice-Chairman: Mr. M. W. Ghali (Saudi Arabia)

Committee III

Chairman: Mr. T. F. Balmer (United Kingdom)

Vice-Chairman: Mr. H.-C. Oldag (Germany, Federal Republic of)

Committee IV

Chairman: Mr. O. Andersen (Norway)

Vice-Chairman: Mr. H. H. Gardner (Canada)

Drafting Committee

Chairman: Mr. J. H. Singman (United States)

Vice-Chairman: Captain Othman bin Darus (Malaysia)

Credentials Committee

Chairman: Mr. E. B. Chamfor (United Republic of Cameroon)

14. The following documentation formed the basis for the work of the Conference:

- A draft International Convention on Training and Certification of Seafarers and related Resolutions prepared by the Sub-Committee on Standards of Training and Watchkeeping of the Inter-Governmental Maritime Consultative Organization and approved by its Maritime Safety Committee;
- Proposals and comments thereon submitted to the Conference by interested governments and organizations;
- Resolutions 8 and 13 adopted by the International Conference on Tanker Safety and Pollution Prevention, 1978.

15. As a result of its deliberations, recorded in the Summary Records of the plenary sessions, the Conference adopted the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, which constitutes Attachment 1 to this Final Act.

16. The Conference also adopted the Resolutions contained in Attachment 2 to this Final Act.

17. The text of this Final Act, including its attachments, is established in a single original text in the Chinese, English, French, Russian and Spanish languages and is deposited with the Secretary-General of the Inter-Governmental Maritime Consultative Organization. Official translations of the Convention shall be prepared in the Arabic and German languages and shall be deposited with this Final Act.

18. The Secretary-General of the Inter-Governmental Maritime Consultative Organization shall send certified copies of this Final Act together with the Resolutions of the Conference, certified copies of the authentic texts of the Convention and, when they have been prepared, of the official translations of the Convention, to the Governments of the States invited to be represented at the Conference, in accordance with the wishes of those Governments.

IN WITNESS WHEREOF the undersigned have affixed their signatures to this Final Act.

DONE at London this seventh day of July one thousand nine hundred and seventy-eight.

[For signatures affixed to the Final Act, see p. 379 in volume 1362.]

ATTACHMENT 2

RESOLUTIONS ADOPTED BY THE CONFERENCE

RESOLUTION 1. OPERATIONAL GUIDANCE FOR OFFICERS
IN CHARGE OF A NAVIGATIONAL WATCH

The Conference,

Recognizing the importance of a safe and efficient navigational watch for the safety of life and property at sea and the prevention of pollution of the marine environment,

Bearing in mind the Basic Principles to Be Observed in Keeping a Navigational Watch, forming part of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978,

Considering the need to establish operational guidance for officers in charge of a navigational watch,

Resolves:

- (a) To adopt the Recommendation on Operational Guidance for Officers in Charge of a Navigational Watch, annexed to this Resolution;
- (b) To urge all Governments concerned to give effect to the contents of this Recommendation as soon as possible,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep this Recommendation under review and to bring any future amendments to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX. RECOMMENDATION ON OPERATIONAL GUIDANCE FOR OFFICERS
IN CHARGE OF A NAVIGATIONAL WATCH*Introduction*

1. This Recommendation contains operational guidance of general application for officers in charge of a navigational watch, which masters are expected to supplement as appropriate. It is essential that officers of the watch appreciate that the efficient performance of their duties is necessary in the interests of the safety of life and property at sea and the prevention of pollution of the marine environment.

General

2. The officer of the watch is the master's representative and his primary responsibility at all times is the safe navigation of the ship. He should at all times comply with the applicable regulations for preventing collisions at sea (see also paragraphs 22 and 23).

3. It is of special importance that at all times the officer of the watch ensures that an efficient look-out is maintained. In a ship with a separate chart room the officer of the watch may visit the chart room, when essential, for a short period for the necessary performance of his navigational duties, but he should previously satisfy himself that it is safe to do so and ensure that an efficient look-out is maintained.

4. The officer of the watch should bear in mind that the engines are at his disposal and he should not hesitate to use them in case of need. However, timely notice of intended variations of engine speed should be given where possible. He should also know the handling characteristics of his ship, including its stopping distance, and should appreciate that other ships may have different handling characteristics.

5. The officer of the watch should also bear in mind that the sound signalling apparatus is at his disposal and he should not hesitate to use it in accordance with the applicable regulations for preventing collisions at sea.

Taking over the navigational watch

6. The relieving officer of the watch should ensure that members of his watch are fully capable of performing their duties, particularly as regards their adjustment to night vision.

7. The relieving officer should not take over the watch until his vision is fully adjusted to the light conditions and he has personally satisfied himself regarding:

- (a) Standing orders and other special instructions of the master relating to navigation of the ship;
- (b) Position, course, speed and draught of the ship;
- (c) Prevailing and predicted tides, currents, weather, visibility and the effect of these factors upon course and speed;
- (d) Navigational situation, including but not limited to the following:
 - (i) Operational condition of all navigational and safety equipment being used or likely to be used during the watch;
 - (ii) Errors of gyro and magnetic compasses;
 - (iii) Presence and movement of ships in sight or known to be in the vicinity;
 - (iv) Conditions and hazards likely to be encountered during his watch;
 - (v) Possible effects of heel, trim, water density and squat* on underkeel clearance.

8. If at the time the officer of the watch is to be relieved a manoeuvre or other action to avoid any hazard is taking place, the relief of the officer should be deferred until such action has been completed.

Periodic checks of navigational equipment

9. Operational tests of shipboard navigational equipment should be carried out at sea as frequently as practicable and as circumstances permit, in particular when hazardous conditions affecting navigation are expected; where appropriate these tests should be recorded.

10. The officer of the watch should make regular checks to ensure that:

- (a) The helmsman or the automatic pilot is steering the correct course;
- (b) The standard compass error is determined at least once a watch and, when possible, after any major alteration of course; the standard and gyro compasses are frequently compared and repeaters are synchronized with their master compass;
- (c) The automatic pilot is tested manually at least once a watch;
- (d) The navigation and signal lights and other navigational equipment are functioning properly.

Automatic pilot

11. The officer of the watch should bear in mind the necessity to comply at all times with the requirements of Regulation 19, Chapter V of the International Convention for the Safety of Life at Sea, 1974. He should take into account the need to station the helmsman and to put the steering into manual control in good time to allow any potentially hazardous situation to be dealt with in a safe manner. With a ship under automatic steering it is highly dangerous to allow a situation to develop to the point where the officer of the watch is without assistance and has to break the continuity of the look-out in order to take emergency action. The change-over from

* *Squat*. The decrease in clearance beneath the ship which occurs when the ship moves through the water and is caused both by bodily sinkage and by change of trim. The effect is accentuated in shallow water and is reduced with a reduction in ship's speed.

automatic to manual steering and vice-versa should be made by, or under the supervision of, a responsible officer.

Electronic navigational aids

12. The officer of the watch should be thoroughly familiar with the use of electronic navigational aids carried, including their capabilities and limitations.

13. The echo-sounder is a valuable navigational aid and should be used whenever appropriate.

Radar

14. The officer of the watch should use the radar when appropriate and whenever restricted visibility is encountered or expected, and at all times in congested waters having due regard to its limitations.

15. Whenever radar is in use, the officer of the watch should select an appropriate range scale, observe the display carefully and plot effectively.

16. The officer of the watch should ensure that range scales employed are changed at sufficiently frequent intervals so that echoes are detected as early as possible.

17. It should be borne in mind that small or poor echoes may escape detection.

18. The officer of the watch should ensure that plotting or systematic analysis is commenced in ample time.

19. In clear weather, whenever possible, the officer of the watch should carry out radar practice.

Navigation in coastal waters

20. The largest scale chart on board, suitable for the area and corrected with the latest available information, should be used. Fixes should be taken at frequent intervals; whenever circumstances allow, fixing should be carried out by more than one method.

21. The officer of the watch should positively identify all relevant navigation marks.

Clear weather

22. The officer of the watch should take frequent and accurate compass bearings of approaching ships as a means of early detection of risk of collision; such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large ship or a tow or when approaching a ship at close range. He should also take early and positive action in compliance with the applicable regulations for preventing collisions at sea and subsequently check that such action is having the desired effect.

Restricted visibility

23. When restricted visibility is encountered or expected, the first responsibility of the officer of the watch is to comply with the relevant rules of the applicable regulations for preventing collisions at sea, with particular regard to the sounding of fog signals, proceeding at a safe speed and having the engines ready for immediate manoeuvres. In addition, he should:

- (a) Inform the master (see paragraph 24);
- (b) Post a proper look-out and helmsman and, in congested waters, revert to hand steering immediately;
- (c) Exhibit navigation lights;
- (d) Operate and use the radar.

It is important that the officer of the watch should know the handling characteristics of his ship, including its stopping distance, and should appreciate that other ships may have different handling characteristics.

Calling the master

24. The officer of the watch should notify the master immediately in the following circumstances:

- (a) If restricted visibility is encountered or expected;
- (b) If the traffic conditions or the movements of other ships are causing concern;
- (c) If difficulty is experienced in maintaining course;
- (d) On failure to sight land, a navigation mark or to obtain soundings by the expected time;
- (e) If, unexpectedly, land or a navigation mark is sighted or change in soundings occurs;
- (f) On the breakdown of the engines, steering gear or any essential navigational equipment;
- (g) In heavy weather if in any doubt about the possibility of weather damage;
- (h) If the ship meets any hazard to navigation, such as ice or derelicts;
- (i) In any other emergency or situation in which he is in any doubt.

Despite the requirement to notify the master immediately in the foregoing circumstances, the officer of the watch should in addition not hesitate to take immediate action for the safety of the ship, where circumstances so require.

Navigation with pilot embarked

25. If the officer of the watch is in any doubt as to the pilot's actions or intentions, he should seek clarification from the pilot; if doubt still exists, he should notify the master immediately and take whatever action is necessary before the master arrives.

Watchkeeping personnel

26. The officer of the watch should give watchkeeping personnel all appropriate instructions and information which will ensure the keeping of a safe watch including an appropriate look-out.

Ship at anchor

27. If the master considers it necessary, a continuous navigational watch should be maintained at anchor. In all circumstances, while at anchor, the officer of the watch should:

- (a) Determine and plot the ship's position on the appropriate chart as soon as practicable; when circumstances permit, check at sufficiently frequent intervals whether the ship is remaining securely at anchor by taking bearings of fixed navigation marks or readily identifiable shore objects;
- (b) Ensure that an efficient look-out is maintained;
- (c) Ensure that inspection rounds of the ship are made periodically;
- (d) Observe meteorological and tidal conditions and the state of the sea;
- (e) Notify the master and undertake all necessary measures if the ship drags anchor;
- (f) Ensure that the state of readiness of the main engines and other machinery is in accordance with the master's instructions;
- (g) If visibility deteriorates, notify the master and comply with the applicable regulations for preventing collisions at sea;
- (h) Ensure that the ship exhibits the appropriate lights and shapes and that appropriate sound signals are made at all times, as required;
- (i) Take measures to protect the environment from pollution by the ship and comply with applicable pollution regulations.

RESOLUTION 2. OPERATIONAL GUIDANCE FOR ENGINEER OFFICERS
IN CHARGE OF AN ENGINEERING WATCH

The Conference,

Recognizing the importance of a safe and efficient engineering watch for the safety of life and property at sea and the prevention of pollution of the marine environment,

Bearing in mind the Basic Principles to Be Observed in Keeping an Engineering Watch, forming part of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978,

Considering the need to establish operational guidance for engineer officers in charge of an engineering watch,

Resolves:

- (a) To adopt the Recommendation on Operational Guidance for Engineer Officers in Charge of an Engineering Watch, annexed to this Resolution;
- (b) To urge all Governments concerned to give effect to the contents of this Recommendation as soon as possible,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep this Recommendation under review and to bring any future amendments to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX. RECOMMENDATION ON OPERATIONAL GUIDANCE FOR ENGINEER
OFFICERS IN CHARGE OF AN ENGINEERING WATCH

Introduction

1. This Recommendation contains operational guidance of general application for engineer officers in charge of a watch during:

- (a) Engineering watch underway (Part I);
- (b) Engineering watch at an unsheltered anchorage (Part II).

2. The chief engineer officer should supplement this operational guidance as appropriate.

3. Every engineer officer in charge of a watch should appreciate that efficient performance of his duties is necessary in the interests of the safety of life and property at sea and the prevention of pollution of the marine environment. The term "watch" as used in this Recommendation means, as appropriate, either "group of personnel composing the watch" or "period of responsibility" during which the physical presence of an engineer officer in the machinery space may or may not be required.

4. This operational guidance including, but not limited to, the following should be taken into account on all ships.

Part I. ENGINEERING WATCH UNDERWAY

General

5. The engineer officer in charge of the watch is the chief engineer's representative and his primary responsibility, at all times, is the safe and efficient operation and upkeep of machinery affecting the safe operation of the ship. He should ensure that at all times bridge orders relating to changes in speed or direction of operation are immediately implemented.

6. The engineer officer in charge of the watch should ensure that the established watch-keeping arrangements are maintained. Under his general direction, engine room ratings, if

forming part of the watch, should assist in the safe and efficient operation of the propulsion machinery and auxiliary equipment.

7. The engineer officer in charge of the watch should keep the main propulsion plant and auxiliary systems under constant supervision until properly relieved. He should also ensure that adequate tours of the machinery and steering gear spaces are made for the purpose of observing and reporting equipment malfunctions or breakdowns, performing or directing routine adjustments, required upkeep and any other necessary tasks.

8. The engineer officer in charge of the watch should direct any other member of the watch to inform him of potentially hazardous conditions which may adversely affect the machinery and jeopardize the safety of life or the ship.

9. The engineer officer in charge of the watch should ensure that the machinery space watch is supervised and arrange for substitute personnel in the event of the incapacity of any watch personnel. The watch should not leave the machinery spaces unsupervised in a manner which would prevent the manual operation of the engine room plant or throttles.

10. The engineer officer in charge of the watch should take the action necessary to contain the effects of damage resulting from equipment breakdown, fire, flooding, rupture, collision, stranding, or other cause.

11. The engineer officer in charge of the watch should ensure that all members of the watch are familiar with the number, location and types of fire-fighting equipment and damage control gear, their use and the various safety precautions to be observed.

12. The engineer officer in charge of the watch should be aware of potential hazards in the machinery spaces which could cause injury, and be able to administer first aid.

13. The engineer officer in charge of the watch should continue to be responsible for machinery space operations despite the presence of the chief engineer officer in the machinery spaces, until the chief engineer officer informs him specifically that he has assumed that responsibility and this is mutually understood.

Taking over the watch

14. The engineer officer in charge of the watch should not hand over the watch to the relieving engineer officer if he has reason to believe that the latter is obviously not capable of carrying out his duties effectively, in which case he should notify the chief engineer officer accordingly. The relieving engineer officer of the watch should satisfy himself that the members of his watch are apparently fully capable of performing their duties effectively.

15. The relieving engineer officer should not take over the watch until he has examined the engine room log and checked that it is in accordance with his own observations.

16. Prior to taking over the watch the relieving engineer officer should satisfy himself regarding at least the following:

- (a) Standing orders and special instructions of the chief engineer officer relating to the operation of the ship's systems and machinery;
- (b) Nature of all work being performed on machinery and systems, personnel involved and potential hazards;
- (c) Level and, where applicable, the condition of water or residues in bilges, ballast tanks, slop tanks, reserve tanks, fresh water tanks, sewage tanks and special requirements for use or disposal of the contents thereof;
- (d) Condition and level of fuel in the reserve tanks, settling tank, day tank and other fuel storage facilities;
- (e) Special requirements relating to sanitary system disposals;
- (f) Condition and mode of operation of the various main and auxiliary systems;
- (g) Where applicable, the condition of monitoring and control console equipment, and which equipment is being operated manually;

- (h) Where applicable, the condition and mode of operation of automatic boiler controls such as flame safeguard control systems, limit control systems, combustion control systems, fuel supply control systems and other equipment related to the operation of steam boilers;
- (i) Potentially adverse conditions resulting from bad weather, ice, contaminated or shallow water;
- (j) Special modes of operation dictated by equipment failure or adverse ship conditions;
- (k) Reports of engine room ratings relating to their assigned duties;
- (l) Availability of fire-fighting appliances.

Periodic checks of machinery

17. It is the responsibility of the engineer officer in charge of the watch to periodically inspect the machinery in his charge. Such inspection should verify that:

- (a) Main and auxiliary machinery, control systems, indicating panels and communication systems are functioning satisfactorily;
- (b) Steering system and all associated gear are functioning satisfactorily;
- (c) Water level is properly maintained in the boiler and heat exchanger equipment;
- (d) Engine or boiler exhausts indicate good combustion characteristics and soot has been blown where applicable;
- (e) Condition of the bilges with respect to water level and contamination is satisfactory;
- (f) Various piping, including control and machinery systems piping are free from leaks, functioning properly and being adequately maintained; special attention is given to pressurized oil piping.

Engine room log

18. Before going off duty, the engineer officer in charge of the watch should ensure that all events related to the main and auxiliary machinery which have occurred during the watch are suitably recorded.

Preventive and repair maintenance

19. The engineer officer in charge of the watch should co-operate with any engineer officer in charge of maintenance work during all preventive maintenance, damage control or repairs. This would include but not necessarily be limited to:

- (a) Isolating and by-passing machinery to be worked on;
- (b) Adjusting the remaining plant to function adequately and safely during the maintenance period;
- (c) Recording, in the engine room log or other suitable document, the equipment worked on and the personnel involved, the safety steps taken and by whom, for the benefit of relieving engineer officers and for record purposes;
- (d) Testing and putting into service, where necessary, the repaired machinery or equipment.

20. The engineer officer in charge of the watch should ensure that any engine room ratings who perform maintenance duties are available to assist in the manual operation of machinery in the event of automatic equipment failure.

Bridge notification

21. The engineer officer in charge of the watch should bear in mind that changes in speed, resulting from machinery malfunction or loss of steering, may imperil the safety of the ship and life at sea. The bridge should be immediately notified, in the event of fire, of impending actions in machinery spaces that may cause reduction in ship's speed, imminent steering failure, stoppage of the ship's propulsion system or any alteration in the generation of electric

power or similar threat to safety. This notification, where possible, should be accomplished before changes are made, in order to afford the bridge the maximum available time to take whatever actions are possible to avoid a potential marine casualty.

Navigation in congested waters

22. The engineer officer in charge of the watch should ensure that all machinery involved with the manoeuvring of the ship can immediately be placed in manual modes of operation when notified that the ship is in congested waters. The engineer officer should also ensure that an adequate reserve of power is available for steering and other manoeuvring requirements. Emergency steering and other auxiliary equipment should be ready for immediate operation.

Navigation during restricted visibility

23. The engineer officer in charge of the watch should ensure a permanent air or steam pressure for fog sound signals. He should be ready to respond to any bridge orders and should ensure, in addition, that auxiliary machinery used for manoeuvring is readily available.

Calling the chief engineer officer

24. The engineer officer in charge of the watch should notify the chief engineer officer without delay, in the following circumstances:

- (i) When engine damage or malfunctions occur which in his opinion are such as to endanger the safe operation of the ship;
- (ii) When malfunctions occur which in his opinion may cause damage or breakdown of propulsion machinery, auxiliary machinery or monitoring and governing systems;
- (iii) In emergencies or in situations when he is in doubt as to what decision or measures to take.

25. Despite the requirement to notify the chief engineer officer in the foregoing circumstances, the engineer officer in charge of the watch should in addition not hesitate to take immediate action for the safety of the ship, its machinery and crew where circumstances require.

Watchkeeping personnel

26. The engineer officer in charge of the watch should give the watchkeeping personnel all appropriate instructions and information which will ensure the keeping of a safe watch. Routine machinery upkeep, performed as incidental tasks as a part of keeping a safe watch, should be set up as a regimen of the watch routine. Detailed repair maintenance involving repairs to electrical, mechanical, hydraulic, pneumatic or applicable electronic equipment throughout the ship should be performed with the cognizance of the engineer officer in charge of the watch and chief engineer officer. These repairs should be recorded.

Part II. ENGINEERING WATCH AT AN UNSHELTERED ANCHORAGE

When a ship is at anchor in an open roadstead or any other virtually "at sea" condition, the engineer officer in charge of the watch should ensure that:

- (a) An efficient watch is kept;
- (b) Periodic inspection is made of all operating and stand-by machinery;
- (c) Main and auxiliary machinery is maintained in a state of readiness in accordance with orders from the bridge;
- (d) Measures are taken to protect the environment from pollution by the ship and that applicable pollution regulations are complied with;
- (e) All damage control and fire-fighting systems are in readiness.

RESOLUTION 3. PRINCIPLES AND OPERATIONAL GUIDANCE FOR DECK OFFICERS
IN CHARGE OF A WATCH IN PORT

The Conference,

Recognizing the importance of keeping a safe and efficient watch in port for the safety of life and property and the prevention of pollution of the marine environment,

Bearing in mind the Basic Principles to Be Observed in Keeping a Navigational Watch, forming part of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978,

Considering the need to establish principles and operational guidance for deck officers in charge of a watch in port,

Resolves:

- (a) To adopt the Recommendation on Principles and Operational Guidance for Deck Officers in Charge of a Watch in Port, annexed to this Resolution;
- (b) To urge all Governments concerned to give effect to the contents of this Recommendation as soon as possible,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep this Recommendation under review and to bring any future amendments to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX. RECOMMENDATION ON PRINCIPLES AND OPERATIONAL GUIDANCE
FOR DECK OFFICERS IN CHARGE OF A WATCH IN PORT

Introduction

1. This Recommendation applies to a ship safely moored or safely at anchor under normal circumstances in port. For ships at an exposed anchorage reference should be made to the additional precautions contained in Regulation II/1, "Basic Principles to Be Observed in Keeping a Navigational Watch", of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 and in the "Recommendation on Operational Guidance for Officers in Charge of a Navigational Watch" adopted by the Conference. Special requirements may be necessary for special types of ships or cargo.

2. The following principles and operational guidance should be taken into account by shipowners, ship operators, masters and watchkeeping officers.

Watch arrangements

3. Arrangements for keeping a watch when the ship is in port should:

- (a) Ensure the safety of life, ship, cargo and port;
- (b) Observe international, national and local rules;
- (c) Maintain order and the normal routine of the ship.

4. The ship's master should decide the composition and duration of the watch depending on the conditions of mooring, type of the ship and character of duties.

5. A qualified deck officer should be in charge of the watch, except in ships under 500 gross register tons not carrying dangerous cargo, in which case the master may appoint whoever has appropriate qualifications to keep the watch in port.

6. The necessary equipment should be so arranged as to provide for efficient watchkeeping.

Taking over the watch

7. The officer of the watch should not hand over the watch to the relieving officer if he has any reason to believe that the latter is obviously not capable of carrying out his duties effectively, in which case he should notify the master accordingly.

8. The relieving officer should be informed of the following by the officer being relieved:

- (a) The depth of water at the berth, ship's draught, the level and time of high and low waters; fastening of the moorings, arrangement of anchors and the slip of the chain, and other features of mooring important for the safety of the ship; state of main engines and availability for emergency use;
- (b) All work to be performed on board the ship; the nature, amount and disposition of cargo loaded or remaining, or any residue on board after unloading the ship;
- (c) The level of water in bilges and ballast tanks;
- (d) The signals or lights being exhibited;
- (e) The number of crew members required to be on board and the presence of any other persons on board;
- (f) The state of fire-fighting appliances;
- (g) Any special port regulations;
- (h) The master's standing and special orders;
- (i) The lines of communication that are available between the ship and the dock staff or port authorities in the event of an emergency arising or assistance being required;
- (j) Other circumstances of importance to the safety of the ship and protection of the environment from pollution.

9. The relieving officer should satisfy himself that:

- (a) Fastenings of moorings or anchor chain are adequate;
- (b) The appropriate signals or lights are properly hoisted and exhibited;
- (c) Safety measures and fire protection regulations are being maintained;
- (d) He is aware of the nature of any hazardous or dangerous cargo being loaded or discharged and the appropriate action in the event of any spillage or fire;
- (e) No external conditions or circumstances imperil the ship and that his own ship does not imperil others.

10. If, at the moment of handing over the watch, an important operation is being performed it should be concluded by the officer being relieved, except when ordered otherwise by the master.

Keeping a watch

11. The officer of the watch should:

- (a) Make rounds to inspect the ship at appropriate intervals;
- (b) Pay particular attention to:
 - (i) The condition and fastening of the gangway, anchor chain or moorings, especially at the turn of the tide or in berths with a large rise and fall and, if necessary, take measures to ensure that they are in normal working condition;
 - (ii) The draught, underkeel clearance and the state of the ship to avoid dangerous listing or trim during cargo handling or ballasting;
 - (iii) The state of the weather and sea;
 - (iv) Observance of all regulations concerning safety precautions and fire protection;
 - (v) Water level in bilges and tanks;

- (vi) All persons on board and their location, especially those in remote or enclosed spaces;
- (vii) The exhibition of any signals or lights;
- (c) In bad weather, or on receiving a storm warning, take the necessary measures to protect the ship, personnel and cargo;
- (d) Take every precaution to prevent pollution of the environment by his own ship;
- (e) In an emergency threatening the safety of the ship, raise the alarm, inform the master, take all possible measures to prevent any damage to the ship and, if necessary, request assistance from the shore authorities or neighbouring ships;
- (f) Be aware of the state of stability so that, in the event of fire, the shore fire-fighting authority may be advised of the approximate quantity of water that can be pumped on board without endangering the ship;
- (g) Offer assistance to ships or persons in distress;
- (h) Take necessary precautions to prevent accidents or damage when propellers are to be turned;
- (i) Enter in the appropriate log-book all important events affecting the ship.

RESOLUTION 4. PRINCIPLES AND OPERATIONAL GUIDANCE FOR ENGINEER OFFICERS IN CHARGE OF AN ENGINEERING WATCH IN PORT

The Conference,

Recognizing the importance of keeping a safe and efficient engineering watch in port for the safety of life and property and the prevention of pollution of the marine environment,

Bearing in mind the Basic Principles to Be Observed in Keeping an Engineering Watch, annexed to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978,

Considering the need to establish principles and operational guidance for engineer officers in charge of an engineering watch in port,

Resolves:

- (a) To adopt the Recommendation on Principles and Operational Guidance for Engineer Officers in Charge of an Engineering Watch in Port, annexed to this Resolution;
 - (b) To urge all Governments concerned to give effect to the contents of this Recommendation as soon as possible,
- Invites the Inter-Governmental Maritime Consultative Organization:
- (a) To keep this Recommendation under review and to bring any future amendments to the attention of all Governments concerned;
 - (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX. RECOMMENDATION ON PRINCIPLES AND OPERATIONAL GUIDANCE FOR ENGINEER OFFICERS IN CHARGE OF AN ENGINEERING WATCH IN PORT

Introduction

1. This Recommendation applies to a ship in service while in port, safely moored or safely at anchor and relates to the requirements for watchkeeping by engineer officers during these periods. Particular requirements may be necessary for special types of propulsion systems or

ancillary equipment and for ships carrying hazardous, dangerous, toxic or highly inflammable materials or other special types of cargo.

Watch arrangements

2. The chief engineer officer of every ship is bound, in consultation with the master, to ensure that engineering watchkeeping arrangements are adequate to maintain a safe engineering watch while in port. When deciding the composition of the engineering watch, which may include appropriate engine room ratings, the following points are among those to be taken into account:

- (a) Type of ship;
- (b) Type and condition of the machinery;
- (c) Special modes of operation dictated by weather, ice, contaminated or shallow water, emergency conditions, damage containment or pollution abatement;
- (d) Qualifications and experience of the ratings forming part of the watch;
- (e) Safety of life, ship, cargo, port and the environment;
- (f) Observance of international, national and local rules;
- (g) Maintaining order in the normal routine of the ship.

3. Under the direction of the chief engineer officer, the engineer officer in charge of the watch is responsible for inspection and testing, as required, of all machines and equipment under his responsibility.

4. (a) On all ships of 3,000 kW propulsion power and over there should always be an engineer officer in charge of the watch.

(b) On ships of 1,500-3,000 kW propulsion power there may be, at the master's discretion and in consultation with the chief engineer officer, no engineer officer in charge of the watch, provided there is a deck officer in charge of the ship, and provided that the ship does not carry hazardous cargo in bulk.

(c) On ships of less than 1,500 kW propulsion power there need not be an engineer officer in charge of the watch, provided that the ship does not carry hazardous cargo in bulk.

5. The composition of the watch should, at all times, be adequate to ensure the safe operation of all machinery related to cargo operation, the safety of the ship, the port and its environment.

6. The engineer officer, while in charge of a watch, should not be assigned or undertake any task or duty which would interfere with his supervisory duty in respect of the ship's machinery system.

Taking over the watch

7. The engineer officer in charge of the watch should not hand over the watch to the relieving engineer officer if he has any reason to believe that the latter is obviously not capable of carrying out his duties effectively, in which case he should notify the chief engineer officer accordingly. The relieving engineer officer of the watch should satisfy himself that the members of his watch are apparently fully capable of performing their duties effectively.

8. Prior to taking over the watch, the relieving engineer officer should be informed by the engineer officer in charge of the watch as to:

- (a) Standing orders of the day, any special orders relating to the ship operations, maintenance functions, repairs to the ship's machinery or control equipment;
- (b) Nature of all work being performed on machinery and systems on board ship, personnel involved and potential hazards;
- (c) Level and condition, where applicable, of water or residue in bilges, ballast tanks, slop tanks, sewage tanks, reserve tanks and special requirements for use or disposal of the contents thereof;

- (d) Any special requirements relating to sanitary system disposals;
- (e) Condition and state of readiness of portable fire-extinguishing equipment and fixed fire-extinguishing installations and fire detection systems;
- (f) Authorized repair personnel on board engaged in engineering activities, their work location and repair functions; other authorized persons and required crew;
- (g) Any port regulations pertaining to ship effluents, fire-fighting requirements, and ship readiness, particularly during potential conditions of bad weather;
- (h) Lines of communication available between the ship and shoreside personnel, including port authorities, in the event of an emergency arising or assistance being required;
- (i) Other circumstances of importance to the safety of the ship, its crew, cargo and the protection of the environment from pollution;
- (j) Procedures for notifying the appropriate authority of environmental pollution resulting from engineering activities.

9. The relieving engineer officer before assuming charge of the watch should:

- (a) Satisfy himself that he is fully aware of all standing and special orders relating to operations, maintenance functions, and repairs to the ship's machinery and control equipment;
- (b) Be familiar with existing and potential sources of power, heat and lighting and their distribution;
- (c) Know the availability and condition of ship's fuel, lubricants and all water supplies;
- (d) Be familiar with the ship's ballast system and its controls;
- (e) Verify the presence of appropriate engine room ratings and satisfy himself that they are physically capable of performing duties effectively;
- (f) Be aware of cargo activities, status of maintenance and repair functions and all other operations affecting the watch;
- (g) Be aware of auxiliary machinery in use for passenger or crew accommodation services, cargo operations, operational water supplies and exhaust systems;
- (h) Be aware of the port requirements for pollution prevention and proper operation of on-board equipment to meet these requirements;
- (i) Be aware of all regulations concerning safety precautions and fire protection and of the means of communication with the shore fire service;
- (j) Be familiar with all shipboard detection and alarm systems and the appropriate response to the activation of those systems;
- (k) Familiarize himself as to the availability and operation of all fire detection alarm and extinguishing systems, method of fire containment, types of portable extinguishing equipment on board and their most effective use;
- (l) Be familiar with the location and use of the equipment provided for the safety of life in the presence of a hazardous or toxic environment;
- (m) Ascertain that materials for administration of emergency first aid are readily available, particularly those required for the treatment of burns and scalds;
- (n) Be aware of all means of communication on board and communications between ship and appropriate shore authorities;
- (o) Be ready to prepare the ship and its machinery, as far as is possible, for stand-by or emergency conditions as required.

Keeping a watch

10. The engineer officer in charge of the watch should pay particular attention to:

- (a) Observance of all orders, special operating procedures and regulations concerning hazardous conditions and their prevention in all areas in his charge;

- (b) Instrumentation and control systems, monitoring of all power supplies, components and systems in operation;
- (c) Techniques, methods and procedures necessary to prevent violation of the pollution regulations of the local authorities;
- (d) State of the bilges.

11. The engineer officer in charge of the watch should:

- (a) In emergencies, sound the alarm when in his opinion the situation so demands, and take all possible measures to prevent damage to the ship, its cargo and persons on board;
- (b) Be aware of the cargo officer's needs relating to the equipment required in the loading or unloading of the cargo and the additional requirements of the ballast and other ship stability control systems;
- (c) Make frequent tours of inspection to determine possible equipment malfunction or failure and take immediate remedial actions to ensure the safety of the ship, cargo operations, the port and its environment;
- (d) Ensure that the necessary precautions are taken, within his responsibility, to prevent accidents or damage to the various electrical, hydraulic, pneumatic and mechanical systems of the ship;
- (e) Ensure that all important events affecting the operation, adjustment or repair of the ship's machinery are satisfactorily recorded.

RESOLUTION 5. BASIC GUIDELINES AND OPERATIONAL GUIDANCE RELATING TO SAFETY RADIO WATCHKEEPING AND MAINTENANCE FOR RADIO OFFICERS

The Conference,

Recognizing the importance of efficient safety radio watchkeeping and maintenance for the safety of life and property at sea,

Bearing in mind the provisions of the Radio Regulations annexed to the International Telecommunication Convention and of the International Convention for the Safety of Life at Sea,

Considering the need to establish basic guidelines and operational guidance on these matters for radio officers,

Resolves:

- (a) To adopt the Recommendation on Basic Guidelines and Operational Guidance Relating to Safety Radio Watchkeeping and Maintenance for Radio Officers, annexed to this Resolution;
- (b) To urge all Governments concerned to give effect to the contents of this Recommendation as soon as possible,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep this Recommendation under review and to bring any future amendments to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX. RECOMMENDATION ON BASIC GUIDELINES AND OPERATIONAL GUIDANCE RELATING TO SAFETY RADIO WATCHKEEPING AND MAINTENANCE FOR RADIO OFFICERS

Introduction

1. Governments should direct the attention of shipowners, ship operators, masters and radio watchkeeping personnel to the following guidelines and operational guidance which

should be complied with to ensure that an adequate safety radio watch is maintained while a ship is at sea.

2. In taking account of the guidelines given in this Recommendation, the Radio Regulations annexed to the International Telecommunication Convention,¹ the International Convention for the Safety of Life at Sea² and other relevant international agreements should be complied with.

3. No provision of this Recommendation in any way amends or alters any provisions contained in the Radio Regulations or Safety Convention and, in the event of any conflict, the Radio Regulations and Safety Convention prevail.

4. In addition, this Recommendation is not intended to preclude in any way future development of the maritime safety system.

A. *Basic guidelines to be observed*

5. The master of every ship should require that:

- (a) The radio watch is maintained in accordance with the relevant provisions of the Radio Regulations and the Safety Convention;
- (b) The equipment is maintained in an efficient working condition.

6. Basic guidelines including, but not limited to, the following should be taken into account on all ships:

- (a) A continuous watch should be maintained on the distress frequency of 500 kHz by the radio officer during his period of watch using headphones or loudspeaker and at other times by the use of the radiotelegraph auto alarm;
- (b) Watch, as may be required by international agreements, should also be maintained on other distress frequencies;
- (c) Safety radio services should be provided to own and other ships;
- (d) Mandatory radiocommunication equipment should be maintained to ensure that, at all times, it is in an efficient operating condition;
- (e) When the radio officer is permitted to discontinue his watch in order to perform other duties in compliance with the Safety Convention or to handle traffic on another frequency or perform other essential radio duties, the radiotelegraph auto alarm should be used if aural reception is impracticable; nevertheless during silence periods, aural watch should be maintained as provided in sub-paragraph (h);
- (f) While at sea when the radio officer is not on duty, the reserve radiotelegraph transmitter and reserve receiver should be tuned to 500 kHz;
- (g) While at sea, the radiotelegraph auto alarm should be tested whenever it is brought into and taken out of operation; if found to be not operating effectively, the master or officer in charge of the navigational watch should be immediately informed;
- (h) During silence periods that occur in watchkeeping hours steps should be taken to watch the frequency 500 kHz to ensure reception of distress and other urgent transmissions which can be done by searching the band 495 to 505 kHz;
- (i) The ship's position, regularly updated, should be available and, at the order of the master, prominently displayed at the operating position; where applicable it should be entered into automatic distress alerting devices;
- (j) A list of ships (names, call signs and positions if known) in the vicinity should be maintained;
- (k) Distress, urgency and safety messages should be passed to the officer in charge of the navigational watch, immediately on receipt;

¹ See note 2 on p. 191 of this volume.

² See note 2 on p. 208 of this volume.

- (l) Routine weather and navigational warning messages for the area the ship is traversing and, at the request of the master, for other areas, should be passed to the officer in charge of the navigational watch immediately on receipt;
- (m) On ships participating in a ship position-reporting system, relevant position messages, authorized by the master, should be sent as necessary;
- (n) The additional watchkeeping hours, not fixed by the Radio Regulations, should be arranged to cover, as far as possible, traffic lists, weather forecasts, navigational warning schedules, transmission of weather observations (in the case of voluntary observing ships) and best high frequency propagation condition times;
- (o) Radiotelephone watchkeeping should be maintained in accordance with the Safety Convention;
- (p) Unauthorized transmissions, especially those made during silence periods or during distress transmissions, and any harmful interference incidents should, if possible, be identified, logged and brought to the attention of the Administration, with an appropriate extract from the radio log in compliance with the Radio Regulations;
- (q) The radio watchkeeper's duties should be so arranged that the efficiency of the watchkeeper is not impaired by fatigue and he is rested and otherwise fit when going on duty;
- (r) Precautions should be taken to ensure that the radio watchkeeper's hearing is not damaged by exposure to excessive extraneous noises on the ship. When unavoidably exposed to excessive noise, hearing protection devices should be worn.

B. *Operational guidance relating to safety radio watchkeeping and maintenance*

General

7. Before the commencement of a voyage, the radio officer in charge should ensure that:

- (a) All radio equipment for which the radio officer is responsible is in an efficient working condition and accumulator batteries are sufficiently charged;
- (b) All documents and supplements required by international agreements, notices to ship radio stations and additional documents required by the controlling Administration are available and discrepancies are reported to the master;
- (c) The radio room clock is accurate;
- (d) Antennae are correctly positioned, undamaged and properly connected.

8. The radio officer should ensure that all relevant documents are corrected and amended in accordance with the latest supplements.

9. When the radio officer first joins a ship, he should ensure that all technical manuals, spares, test instruments and tools for the radiocommunication equipment and, at the discretion of the master, for radio navigational equipment are on board. Discrepancies should be reported to the master.

Watchkeeping duties

10. *Radiotelegraph.* (a) Immediately prior to sailing from a port, the radio officer should, where practicable, update routine weather and navigational warning messages for the area the ship will be traversing and, at the request of the master, for other areas and pass such messages to the master.

(b) On sailing from a port and opening the station, the radio officer should:

- (i) Listen on the distress frequency 500 kHz for a possible existing distress situation;
- (ii) Send TR (name, position and destination, etc.) to the local coast station and other appropriate coast stations from which traffic may be expected;
- (iii) Copy weather forecasts and navigational warnings on the first relevant transmissions.

(c) When the station is open, the radio officer should:

- (i) Enable chronometer checks to be made by relaying time signals to the chartroom at least once a day;
- (ii) Check the radio room clock against standard time signals at least once a day;
- (iii) On selected ships, endeavour to clear as many of the OBS (weather report) messages as are available, via relevant coast stations, during watchkeeping hours;
- (iv) Send a TR when entering the area of a medium frequency or other coast station from which traffic might be expected; the coast station concerned should be informed on leaving its service area;
- (v) As far as possible, listen to traffic lists transmitted by coast stations from which traffic might be expected; on hearing his ship's call sign, reply as soon as possible;

(d) When closing the station on arrival at a port, the radio officer should:

- (i) Advise the local coast station and other coast stations with which contact has been maintained of the ship's arrival and closing of the station;
- (ii) Ensure that antennae are earthed;
- (iii) Check that accumulator batteries are sufficiently charged.

11. *Radiotelephone.* (a) Whenever a radio watch on 2,182 kHz is being kept in the radio room, this frequency should be monitored for distress, urgency or safety transmissions.

(b) Where any such transmissions are intercepted, the procedure detailed in the relevant sections of paragraphs 12, 13 and 14 should be followed.

(c) Times of opening and closing any monitoring watch on 2,182 kHz and details of any distress, urgency or safety traffic, which are not repetitions of those already heard on 500 kHz, should be entered in the radio log.

Action to be taken in cases of distress, urgency and safety

12. *Distress.* The distress call should have absolute priority over all other transmissions. All stations which hear it should immediately cease any transmissions capable of interfering with distress traffic.

(a) In cases of distress affecting own ship, the radio officer should:

- (i) Obtain from the bridge the ship's actual or estimated position or, if not available, use the last known position or the true bearing and distance from a fixed geographical position; when using the last known position, time of such position should be stated in GMT;
- (ii) Normally transmit on 500 kHz using the radiotelegraph distress procedure in accordance with the Radio Regulations; the distress call and message should be sent only on the authority of the master or person responsible for the ship; other suitable international distress frequencies (or other frequencies), if necessary, may be used in accordance with the Radio Regulations;
- (iii) Repeat at intervals, especially during silence periods, the distress message, preceded by the alarm signal, if necessary, and the distress call, until an answer is received;
- (iv) If no answer is received to a distress message sent on a distress frequency, repeat the message on any other available frequency on which attention might be attracted;
- (v) Use any means in order to attract attention;
- (vi) Pass to the master all distress communications immediately on receipt;
- (vii) If the ship has to be abandoned before being located by other ships, set the radio apparatus for continuous emission, if considered necessary and circumstances permit.

(b) In cases of distress affecting other ships, the radio officer should:

- (i) Copy the message and pass it to the bridge;

- (ii) At the same time, if possible, ensure that a direction finder bearing is obtained; if the bearing is relative, the ship's heading should also be noted;
 - (iii) If, beyond any doubt, his ship is in the vicinity of the distress, immediately acknowledge receipt; in areas where reliable communications with coast stations are practicable, defer acknowledgement for a short interval so that a coast station may acknowledge receipt;
 - (iv) If, beyond any doubt, his ship is not in the vicinity of the distress, allow a short interval of time to elapse before acknowledging receipt of the message to permit nearer stations to acknowledge receipt without interference;
 - (v) Not acknowledge receipt:
 - (1) When his ship is a long distance away from the distress and not in a position to render assistance, except when a distress message is heard which has not been acknowledged;
 - (2) Of a distress message transmitted by a coast station until the master has confirmed that the ship is in a position to render assistance;
 - (vi) In the case indicated in sub-paragraph (v)(1); and when:
 - (1) It has been learned that a ship in distress is not itself in a position to transmit a distress message; or
 - (2) The master considers that further help is necessary; or
 - (3) An emergency position-indicating radio beacon signal has been received while no distress or urgency traffic is being passed;

transmit a distress message using the appropriate transmitter on full power, whenever possible preceded by the alarm signal, using the DDD procedures on 500 kHz or "May-day Relay" procedures on 2,182 kHz or 156.8 MHz, as appropriate, or on any other frequency which may be used in case of distress and take all other steps, as if it were own ship in distress, to notify authorities who may be able to render assistance;
 - (vii) On the order of the master, transmit as soon as possible own ship's name, position, speed and estimated time of arrival at the distress position and, if the position of the ship in distress appears doubtful, the true bearing of the ship in distress preceded by the abbreviation QTE and classification of the bearing;
 - (viii) Record and pass to the bridge other acknowledgements, positions and times of arrival and other relevant distress traffic;
 - (ix) If control of distress traffic is taken over by a coast station or a ship more favourably placed to assist the one in distress, normally work with that control station;
 - (x) Remain on continuous watch until the distress ends; if adequate assistance is being provided by closer ships or contact has been made with coast stations and no possibility exists of being required to provide relay facilities or specialized advice, normal watch may be resumed.
13. *Urgency.* (a) In cases of urgency affecting own ship, the radio officer should:
- (i) Using the radiotelegraph urgency procedure, send, only on the authority of the master, the urgency signal and message on 500 kHz or on any other frequency which may be used in case of distress. In the case of a long message, or a medical call, or when repeating the message in areas of heavy traffic, transmit the message on a working frequency. In such cases include in the call details of the frequency on which the urgency message will be transmitted;
 - (ii) If the urgency message concerns the loss of a person or persons overboard, be permitted to precede the call by the alarm signal, only when the assistance of other ships is required and cannot be satisfactorily obtained by the use of the urgency signal;

- (iii) If the message is addressed to a particular station, establish contact with that station before transferring to a working frequency;
 - (iv) If the message is addressed to all stations, allow a reasonable period before repeating the call and transmitting the message;
 - (v) When an urgency addressed to all stations is ended and action is no longer necessary, send a message of cancellation on the relevant frequency addressed to all stations.
- (b) In cases of urgency affecting other ships, the radio officer should:
- (i) As the urgency signal has priority over all other communications except distress, take care not to interfere with it or the transmission of the message that follows the urgency signal;
 - (ii) Copy the message and pass it to the bridge;
 - (iii) Continue to listen for at least three minutes; at the end of that period, if no urgency message has been heard, notify a coast station, if possible, of the receipt of the urgency signal; thereafter resume normal working;
 - (iv) If the urgency signal is addressed to a particular station, be permitted to continue working on frequencies other than that in use for the transmission of the urgency signal or urgency message; all assistance should be given, if required, in the clearance of the urgency message to the addressee, for example by re-transmission.

14. *Safety.* (a) When a safety message is to be transmitted, the radio officer should:

- (i) Send the safety signal towards the end of the first available silence period and call on one or more of the international distress frequencies (500 kHz, 2,182 kHz and 156.8 MHz where applicable) or on any other frequency which may be used in case of distress;
- (ii) Immediately after the end of the silence period send the safety message which follows the call, on a working frequency, making a suitable announcement to this effect at the end of the call; outside regions of heavy traffic short safety messages may be sent exceptionally on the frequency 500 kHz;
- (iii) Transmit safety calls and messages, which contain important meteorological and navigational warnings, as soon as possible and repeat them at the end of the first silence period that follows.

(b) On hearing the safety signal,* the radio officer should:

- (i) Not interfere with the signal or message;
- (ii) Copy the message and pass it to the bridge;
- (iii) Give every assistance in disseminating, as necessary, such messages when addressed to "all ships" and re-transmit to the addressee messages of a more limited nature, if so requested.

Other duties

15. *Log-keeping.* (a) The radio log should be kept in compliance with the requirements of the Radio Regulations and the Safety Convention.

(b) The radio log should be kept in the radio room and should be available for inspection by authorized officials of the Administration; the times of all entries should be recorded in GMT.

(c) The radio log should at all times be available for inspection by the master and the radio officer should call his attention to any entry important to safety.

16. *Essential tests.* While the ship is at sea, tests should be made by the radio officer in accordance with the Safety Convention. In addition, the following should be carried out to facilitate early detection of developing faults:

* A coast station may broadcast an urgent cyclone warning as a safety message preceded by the alarm signal and the safety signal.

- (a) At least once a week check the automatic keying device for signal formation and timing;
- (b) At regular intervals check all metered test points in the radiocommunication equipment and record abnormalities;
- (c) When possible test the portable and fixed radio apparatus in a survival craft afloat; in any event, every three months test the portable and fixed radio apparatus in a survival craft on board ship; when the tests are undertaken with the antenna rigged, efforts should be made to establish contact with other ships or coast stations provided no interference is caused to other transmissions; when non-chargeable batteries are used in the survival craft radio equipment, they should be replaced at the intervals recommended by the manufacturers or earlier if performance on test is degraded;
- (d) At intervals, when within sight of a radio beacon, in co-operation with a navigating officer, check bearings should be taken to verify the accuracy of the direction finder calibration curve on as many ship's headings as possible; the results should be recorded and reported to the master; possible shipboard causes of errors, including alteration to wire rigging and unauthorized antennae should be sought and reported to the master.

17. *Demonstration of portable radio apparatus for survival craft.* Whenever possible, the operation of the portable radio apparatus for survival craft should be demonstrated to new crew members in order to familiarize them in its use. When the apparatus is tested in survival craft, the rigging and operation of it should be demonstrated to as many crew members as possible.

18. *Demonstration of reserve radiotelegraph equipment.* Where Administrations require an instruction chart and related numbering indicators on the reserve radiotelegraph equipment, including automatic keying devices, suitable persons designated by the master to use such equipment in an emergency when the radio officer is incapacitated for any reason, should be given demonstrations in such procedure at appropriate intervals.

19. *Maintenance.* (a) While the ship is at sea or in port, the radio officer should ensure that all equipment in his charge is effectively maintained. To this end, he should follow the procedures in the "Guidelines for an Effective Preventive Maintenance Programme" in the Appendix, attached to this Recommendation.

(b) *Records.* A separate "Equipment Maintenance and Repair Record" should be kept for logging all maintenance undertaken, as well as all observed abnormalities, for future reference and correlation with fault occurrence. It should be indexed by major equipment type and be retained aboard the vessel. The record should include details of:

- (i) Date and time of preventive or corrective maintenance procedures, including total time out of service;
- (ii) Equipment involved;
- (iii) Condition of equipment at outset of procedure;
- (iv) Abnormalities noted, if any;
- (v) Any preventive maintenance steps taken (where no abnormality is noted) and corrective maintenance procedures undertaken where abnormality is found;
- (vi) Components repaired or adjusted;
- (vii) Condition of the equipment after steps taken under (v) and (vi) above are completed;
- (viii) Spare parts consumed.

Additional provisions for ships carrying more than one radio officer

20. When taking over the radio watch, the relieving radio officer should arrive in the radio room in sufficient time to:

- (a) Check whether distress, urgency or safety traffic is in progress;
- (b) Check that the updated ship's position is available and displayed at the usual place;

- (c) Enquire as to special orders or requests, including messages expected and unusual weather reports requested;
- (d) "Sign on" in the radio log as soon as the outgoing radio officer has completed entries and "signed off".

21. When handing over the radio watch, the radio officer on watch should:

- (a) Pass on any special orders or requests to his relief and inform him of any abnormal propagation conditions or other items of direct concern;
- (b) Complete the radio log and "sign off".

APPENDIX. GUIDELINES FOR AN EFFECTIVE PREVENTIVE MAINTENANCE PROGRAMME

1. *Objectives.* Preventive maintenance is designed to:

- (a) Keep the equipment operating for the longest possible period of time without breakdown;
- (b) Maintain it at optimum operating efficiency;
- (c) Protect it from detrimental effects of vibration, dirt, dust, moisture, corrosion and temperature;
- (d) Prolong its useful life.

It must be recognized that in many types of equipment and devices modern manufacturing techniques are producing high density electronic packages of high integrity for which the advice of the equipment manufacturers should be taken into account in incorporating individual equipment into regular preventive maintenance schedules.

2. *General procedures applicable to all equipment*

(a) *Safeguarding personnel.* When working with dangerous voltages, all necessary safety precautions should be observed, and a "standby man" should be present when reaching into such equipment.

(b) *Safeguarding equipment*

- (i) Handle components, circuits and cables carefully, use tools with care, provide good mechanical mating of plugs, screws and threads;
- (ii) Maintain an inventory of appropriate spares and requisition replacements for consumed items;
- (iii) Inspect all equipment for dirt, corrosion, signs of overheating, foreign matter, poor connections and displaced components or wires;
- (iv) Inspect all equipment for mechanical insecurity, including loose screws, contacts and components;
- (v) Where required, lubricants should be applied with care;
- (vi) In the absence of other instructions faulty components should be disposed of and not kept among spares; in exceptional cases, when no spares are on board, doubtful components may be kept and clearly marked "doubtful" until new spares are provided.

3. *Maintenance and care of tools and test instruments.* The tools and instruments should not be misused. Instruments should, if necessary, be sent ashore for calibration.

4. *Antennae and earthing system care.* The protection against antenna breakage should be inspected to ensure proper fitting and condition. All antennae should be regularly inspected for snagging or weakening of wire antenna and fracture of rod antenna, and any necessary remedial action taken. Insulation, including insulators in whistle lanyards, triatics, stays and direction finder loops, should be cleaned regularly and, where possible, any damaged items replaced. Earthing straps, including those on stays, should be inspected and tested regularly for low resistance contact.

RESOLUTION 6. BASIC GUIDELINES AND OPERATIONAL GUIDANCE RELATING TO SAFETY RADIO WATCHKEEPING FOR RADIOTELEPHONE OPERATORS

The Conference,

Recognizing the importance of efficient safety radio watchkeeping for the safety of life and property at sea,

Bearing in mind the provisions of the Radio Regulations annexed to the International Telecommunication Convention and of the International Convention for the Safety of Life at Sea,

Considering the need to establish basic guidelines and operational guidance on these matters for radiotelephone operators,

Resolves:

- (a) To adopt the Recommendation on Basic Guidelines and Operational Guidance Relating to Safety Radio Watchkeeping for Radiotelephone Operators annexed to this Resolution;
- (b) To urge all Governments concerned to give effect to the contents of this Recommendation as soon as possible,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep this Recommendation under review and to bring any future amendments to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX. RECOMMENDATION ON BASIC GUIDELINES AND OPERATIONAL GUIDANCE RELATING TO SAFETY RADIO WATCHKEEPING FOR RADIOTELEPHONE OPERATORS

Introduction

1. Governments should direct the attention of shipowners, ship operators, masters and radio watchkeeping personnel to the following guidelines and operational guidance which should be complied with to ensure that an adequate safety radio watch is maintained while a ship is at sea.

2. In taking account of the guidelines given in this Recommendation, the Radio Regulations annexed to the International Telecommunication Convention,* the International Convention for the Safety of Life at Sea** and any other relevant international agreements should be complied with.

3. No provision of this Recommendation in any way amends or alters any provisions contained in the Radio Regulations or Safety Convention and, in the event of any conflict, the Radio Regulations and Safety Convention prevail.

4. In addition, this Recommendation is not intended to preclude in any way future development of the maritime safety system.

A. *Basic guidelines to be observed*

5. The master of every ship to which the Safety Convention applies should require that:

- (a) The radiotelephone watch is maintained in accordance with the relevant provisions of the Radio Regulations and the Safety Convention;
- (b) The equipment and, where provided, the reserve source of energy are maintained in an efficient working condition.

* Hereinafter referred to as the Radio Regulations.

** Hereinafter referred to as the Safety Convention.

6. The master of every ship to which paragraph 5 does not apply, should require that radiotelephone watch is adequately maintained as determined by the Administration, taking into account the Radio Regulations.

7. The master should ensure that the radiotelephone station is controlled by a radiotelephone operator and, in an emergency concerning own or other ships, that the radiotelephone station is properly manned.

8. Basic guidelines including, but not limited to, the following should be taken into account on all ships:

- (a) A continuous watch should be maintained on the distress frequency 2,182 kHz in compliance with the Safety Convention; on ships not covered by the Safety Convention, the radiotelephone watch should be kept as prescribed by the Administration;
- (b) Watch should be maintained on VHF in compliance with the Radio Regulations and the Safety Convention;
- (c) Safety radiotelephone services should be provided to own and other ships;
- (d) During silence periods the mute should be lifted from the filtered loudspeaker and auto alarm and an adequate volume level set to ensure that no distress messages are missed; since repetitions of urgency and safety messages may be transmitted at the end of silence periods, this aural watch should be continued for an adequate period after the end of each silence period;
- (e) Distress, urgency and safety messages should be passed to the master immediately on receipt;
- (f) Routine weather and navigational warning messages for the area the ship is traversing, and for other areas of direct interest, should be noted;
- (g) On ships participating in a ship position-reporting system, relevant position messages, authorized by the master, should be sent as necessary.

9. Unauthorized transmissions, especially those made during silence periods or during distress transmissions and any harmful interference incidents should, if possible, be identified, logged and brought to the attention of the Administration, with an appropriate extract from the radio log in compliance with the Radio Regulations.

B. *Operational guidance relating to safety radiotelephone watchkeeping*

General

10. Before the commencement of the voyage, the radiotelephone operator should ensure that:

- (a) All radio equipment for which the radiotelephone operator is responsible is in an efficient working condition and accumulator batteries are sufficiently charged;
- (b) All documents and supplements required by international agreements, notices to ship radio stations and additional documents required by the controlling Administration are available and discrepancies are reported to the master;
- (c) The radio room clock is accurate;
- (d) Antennae are correctly positioned, undamaged and properly connected.

11. The radiotelephone operator should ensure that all relevant documents are corrected and amended in accordance with the latest supplements.

Watchkeeping duties

12. Immediately prior to sailing from a port, the radiotelephone operator should, where practicable, update routine weather and navigational warning messages for the area the ship will be traversing and, at the request of the master, for other areas and pass such messages to the master.

13. On sailing from a port and opening the station, the radiotelephone operator should:
- (a) Listen on the appropriate distress frequency for a possible existing distress situation;
 - (b) Send TR (name, position and destination, etc.) to the local coast station and other appropriate coast stations from which traffic may be expected;
 - (c) Copy weather forecasts and navigational warnings on the first relevant transmissions.
14. When the station is open, the radiotelephone operator should:
- (a) Check the radio clock against standard time signals at least once a day;
 - (b) Send a TR when entering the area of a coast station from which traffic might be expected; the coast station concerned should be informed on leaving its service area.
15. When closing the station on arrival at a port, the radiotelephone operator should:
- (a) Advise the local coast station and other coast stations with which contact has been maintained of the ship's arrival and closing of the station;
 - (b) Ensure that antennae are earthed;
 - (c) Check that accumulator batteries are sufficiently charged.

Action to be taken in cases of distress, urgency and safety

16. *Distress.* The distress call should have absolute priority over all other transmissions. All stations which hear it should immediately cease any transmissions capable of interfering with distress traffic.

- (a) In cases of distress affecting own ship, the radiotelephone operator should:
 - (i) Obtain from the bridge the ship's actual or estimated position or, if not available, use the last known position or the true bearing and distance from a fixed geographical position; when using the last known position, time of such position should be stated in GMT;
 - (ii) Normally transmit on 2,182 kHz, and, when appropriate, on 156.8 MHz using the radiotelephone distress procedure in accordance with the Radio Regulations; the distress call and message should be sent only on the authority of the master or person responsible for the ship; other suitable international distress frequencies (or other frequencies), if necessary, may be used in accordance with the Radio Regulations;
 - (iii) Transmit, whenever possible, the alarm signal as any ship in the vicinity keeping watch by means of a filtered loudspeaker or alarm receiver will not hear a spoken message unless first alerted by reception of the alarm signal; send the radiotelephone alarm signal, when generated by automatic means, continuously for a period of at least 30 seconds, but not exceeding one minute; when generated by other means, send the signal as continuously as practicable over a period of approximately one minute;
 - (iv) Repeat at intervals, especially during silence periods, the distress message, preceded by the alarm signal whenever possible, and the distress call, until an answer is received;
 - (v) If no answer is received to a distress message sent on a distress frequency, repeat the message on any other available frequency on which attention might be attracted;
 - (vi) Use any means in order to attract attention;
 - (vii) Pass to the master all distress communications immediately on receipt.
- (b) In cases of distress affecting other ships, the radiotelephone operator should:
 - (i) Copy the message and pass it to the master;
 - (ii) At the same time, if possible, ensure that a direction finder bearing is obtained; if the bearing is relative, the ship's heading should also be noted;
 - (iii) If, beyond any doubt, his ship is in the vicinity of the distress, immediately acknowledge receipt; in areas where reliable communications with coast stations are practicable, defer acknowledgement for a short interval so that a coast station may acknowledge receipt;

- (iv) If, beyond any doubt, his ship is not in the vicinity of the distress, allow a short interval of time to elapse before acknowledging receipt of the message to permit nearer stations to acknowledge receipt without interference;
 - (v) Not acknowledge receipt:
 - (1) When his ship is a long distance away from the distress and not in a position to render assistance, except when a distress message is heard which has not been acknowledged;
 - (2) Of a distress message transmitted by a coast station until the master has confirmed that the ship is in a position to render assistance;
 - (vi) In the case indicated in sub-paragraph (v)(1); and when:
 - (1) It has been learned that a ship in distress is not itself in a position to transmit a distress message; or
 - (2) The master considers that further help is necessary; or
 - (3) An emergency position-indicating radio beacon signal has been received while no distress or urgency traffic is being passed;transmit a distress message using the appropriate transmitter on full power, whenever possible preceded by the alarm signal, using the "Mayday Relay" procedures on 2,182 kHz or 156.8 MHz, as appropriate, or on any other frequency which may be used in case of distress and take all other steps, as if it were own ship in distress, to notify authorities who may be able to render assistance;
 - (vii) On the order of the master, transmit as soon as possible own ship's name, position, speed and estimated time of arrival at the distress position and, if the position of the ship in distress appears doubtful, the direction finder bearing;
 - (viii) Record and pass to the master other acknowledgements, positions and times of arrival and other relevant distress traffic;
 - (ix) If control of distress traffic is taken over by a coast station or a ship more favourably placed to assist the one in distress, normally work with that control station.
17. *Urgency.* (a) In cases of urgency affecting own ship, the radiotelephone operator should:
- (i) Using the radiotelephone urgency procedure, send, only on the authority of the master, the urgency signal and message on 2,182 kHz and, when appropriate, on 156.8 MHz or on any other frequency which may be used in case of distress; in the case of a long message, or a medical call, or when repeating the message in areas of heavy traffic, transmit the message on a working frequency; in such cases, include in the call details of the frequency on which the urgency message will be transmitted;
 - (ii) If the urgency message concerns the loss of a person or persons overboard, be permitted to precede the call by the alarm signal, only when the assistance of other ships is required and cannot be satisfactorily obtained by the use of the urgency signal;
 - (iii) If the message is addressed to a particular station, establish contact with that station before transferring to a working frequency;
 - (iv) If the message is addressed to all stations, allow a reasonable period before repeating the call and transmitting the message;
 - (v) When an urgency addressed to all stations is ended and action is no longer necessary, send a message of cancellation on the relevant frequency addressed to all stations.
- (b) In cases of urgency affecting other ships, the radiotelephone operator should:
- (i) As the urgency signal has priority over all other communications, except distress, take care not to interfere with it or the transmission of the message that follows the urgency signal;
 - (ii) Copy the message and pass it to the master;

- (iii) Continue to listen for at least three minutes; at the end of that period, if no urgency message has been heard, notify a coast station, if possible, of the receipt of the urgency signal; thereafter resume normal working;
- (iv) If the urgency signal is addressed to a particular station, be permitted to continue working on frequencies other than that in use for the transmission of the urgency signal or urgency message; all assistance should be given, if required, in the clearance of the urgency message to the addressee, for example by re-transmission.

18. *Safety.* (a) When a safety message is to be transmitted, the radiotelephone operator should:

- (i) Send the safety signal towards the end of the first available silence period and call on 2,182 kHz and, when appropriate, 156.8 MHz or on any other frequency which may be used in case of distress;
 - (ii) Immediately after the end of the silence period, send the safety message which follows the call on a working frequency, making a suitable announcement to this effect at the end of the call;
 - (iii) Transmit safety calls and messages, which contain important meteorological and navigational warnings as soon as possible and repeat them at the end of the first silence period that follows.
- (b) On hearing the safety signal,* the radiotelephone operator should:
- (i) Not interfere with the signal or message;
 - (ii) Copy the message and pass it to the master;
 - (iii) Give every assistance in disseminating, as necessary, such messages when addressed to "all ships" and re-transmit to the addressee messages of a more limited nature, if so requested.

Other duties

19. *Log-keeping.* (a) The radiotelephone log should be kept in compliance with the requirements of the Radio Regulations and the Safety Convention.

(b) The radiotelephone log should be kept at the place where listening watch is maintained and should be available for inspection by authorized officials of the Administration; the times of all entries should be recorded in GMT.

(c) The radiotelephone log should at all times be available for inspection by the master and the radiotelephone operator should call his attention to any entry important to safety.

20. *Maintenance.* The radiotelephone operator should:

- (a) Test accumulator batteries and, if necessary, bring them up to a sufficiently charged condition;
- (b) Inspect the protection against antenna breakage and ensure proper fitting and condition;
- (c) Inspect antennae for snagging or weakening and take any necessary remedial action;
- (d) Inspect insulators in whistle lanyards, triatics and stays, clean regularly and, where possible, replace damaged items;
- (e) Inspect weekly the condition of portable radio apparatus for survival craft.

* A coast station may broadcast an urgent cyclone warning as a safety message preceded by the radiotelephone alarm signal and the safety signal.

RESOLUTION 7. RADIO OPERATORS

The Conference,

Recognizing the importance of efficient safety radio watchkeeping and maintenance for the safety of life and property at sea,

Noting that there are ships where radiotelegraph equipment is installed but not required by the International Convention for the Safety of Life at Sea,

Bearing in mind the provisions of the Radio Regulations annexed to the International Telecommunication Convention, according to which the radiotelegraph service on such ships may be carried out by a radio operator who is the holder of a radiotelegraph operator's special certificate,

Resolves:

- (a) To adopt the following Recommendations, annexed to this Resolution:
 - (i) Recommendation on Minimum Requirements for Certification of Radio Operators;
 - (ii) Recommendation on Minimum Requirements to Ensure the Continued Proficiency and Up-dating of Knowledge for Radio Operators;
 - (iii) Recommendation on Basic Guidelines and Operational Guidance Relating to Safety Radio Watchkeeping and Maintenance for Radio Operators;
 - (iv) Recommendation on Training for Radio Operators;
- (b) To urge all Governments concerned to give effect to the contents of these Recommendations as soon as possible,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep these Recommendations under review and to bring any future amendments to the attention of all Governments concerned;
- (b) To keep the Recommendation on Training for Radio Operators under review, in consultation or association, as appropriate, with other international organizations, particularly with the International Labour Organisation and the International Telecommunication Union;
- (c) To communicate this Resolution to all Governments invited to the Conference.

ANNEX 1. RECOMMENDATION ON MINIMUM REQUIREMENTS FOR
CERTIFICATION OF RADIO OPERATORS

1. Every radio operator in charge of or performing radio duties in a ship in which a radiotelegraph station is provided, but not prescribed by international agreements, should hold an appropriate certificate or certificates, issued or recognized by the Administration, under the provisions of the Radio Regulations.

2. In addition, a radio operator should:

- (a) Be not less than 18 years of age;
- (b) Satisfy the Administration as to medical fitness, particularly regarding eyesight, hearing and speech;
- (c) Meet the requirements of the Appendix to Annex I of this Recommendation.

3. Every candidate for a certificate should be required to pass an examination or examinations to the satisfaction of the Administration concerned.

4. The level of knowledge required for certification should be sufficient for the radio operator to carry out his radio duties safely and efficiently. In determining the appropriate level of knowledge and the training necessary to achieve that knowledge and practical ability, the Administration should take into account the requirements of the Radio Regulations and the Appendix to this Recommendation. Administrations should also take into account the other relevant resolutions adopted by the International Conference on Training and Certification of Seafarers, 1978, and relevant IMCO recommendations.

APPENDIX. MINIMUM ADDITIONAL KNOWLEDGE AND TRAINING
REQUIREMENTS FOR RADIO OPERATORS

1. In addition to the requirements for the issue of a certificate in compliance with the Radio Regulations, radio operators should have knowledge and training, including practical training, in the following:

- (a) The provision of radio services in emergencies, including:
 - (i) Abandon ship;
 - (ii) Fire aboard ship;
 - (iii) Partial or full breakdown of the radio station;
- (b) The operation of lifeboats, liferafts, buoyant apparatus and their equipment, with special reference to portable and fixed lifeboat radio apparatus and emergency position-indicating radio beacons;
- (c) Survival at sea;
- (d) First aid;
- (e) Fire prevention and fire-fighting with particular reference to the radio installation;
- (f) Preventive measures for the safety of ship and personnel in connexion with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards;
- (g) The use of the IMCO Merchant Ship Search and Rescue Manual (MERSAR), with particular reference to radiocommunications;
- (h) Ship position-reporting systems and procedures;
- (i) The use of the International Code of Signals and the IMCO Standard Marine Navigational Vocabulary;
- (j) Radio medical systems and procedures.

ANNEX II. RECOMMENDATION ON MINIMUM REQUIREMENTS TO ENSURE THE CONTINUED
PROFICIENCY AND UPDATING OF KNOWLEDGE FOR RADIO OPERATORS

1. Every radio operator holding a certificate or certificates issued or recognized by the Administration should, in order to continue to qualify for sea-going service, be required to satisfy the Administration as to the following:

- (a) Medical fitness, particularly regarding eyesight, hearing and speech, at regular intervals not exceeding five years; and
- (b) Professional competence:
 - (i) By approved radiocommunications service as a radio operator with no single interruption of service exceeding five years;
 - (ii) Following such interruption, by passing an approved test or successfully completing an approved training course or courses at sea or ashore, which should include elements that are of direct relevance to the safety of life at sea and modern radio-communication equipment and may also include radionavigation equipment.

2. When new modes, equipment or practices are being introduced aboard ships entitled to fly its flag, the Administration may require radio operators to pass an approved test or successfully complete an appropriate training course or courses, at sea or ashore, with particular reference to safety duties.

3. Every radio operator should, to continue to qualify for sea-going service on board particular types of ships for which special training requirements have been internationally agreed upon, successfully complete approved relevant training or pass examinations which should take into account relevant international regulations and recommendations.

4. The Administration should ensure that the texts of recent changes in international regulations relating to radiocommunications and relevant to the safety of life at sea are available to ships under its jurisdiction.

5. Administrations are encouraged, in consultation with those concerned, to formulate or promote the formulation of a structure of refresher and updating courses either voluntary or mandatory, as appropriate, at sea or ashore, for radio operators who are serving at sea and especially re-entrants to sea-going service. The course or courses should include changes in marine radiocommunication technology and relevant international regulations and recommendations* concerning the safety of life at sea.

ANNEX III. RECOMMENDATION ON BASIC GUIDELINES AND OPERATIONAL GUIDANCE RELATING TO SAFETY RADIO WATCHKEEPING AND MAINTENANCE FOR RADIO OPERATORS

Introduction

1. Governments should direct the attention of shipowners, ship operators, masters and radio watchkeeping personnel to the following guidelines and operational guidance which should be complied with to ensure that an adequate safety radio watch is maintained while a ship is at sea.

2. In taking account of the guidelines given in this Recommendation, the Radio Regulations annexed to the International Telecommunication Convention,** the International Convention for the Safety of Life at Sea*** and other relevant international agreements should be complied with.

3. No provision of this Recommendation in any way amends or alters any provisions contained in the Radio Regulations or Safety Convention and, in the event of any conflict, the Radio Regulations and Safety Convention prevail.

4. In addition, this Recommendation is not intended to preclude in any way future development of the maritime safety system.

A. Basic guidelines to be observed

5. The master of every ship should require that:

- (a) The radio watch is maintained in accordance with the relevant provisions of the Radio Regulations and Safety Convention;
- (b) The equipment is maintained in an efficient working condition.

6. Basic guidelines including, but not limited to the following, should be taken into account on all ships:

- (a) A watch, as continuous as possible, should be maintained on the distress frequency of 500 kHz and other appropriate distress frequencies;
- (b) Safety radio services should be provided to own and other ships;

* Including any IMCO recommendations concerning the development of the maritime distress system.

** Hereinafter referred to as the Radio Regulations.

*** Hereinafter referred to as the Safety Convention.

- (c) Mandatory radiocommunication equipment should be kept in an efficient operating condition;
- (d) During silence periods that occur in watchkeeping hours steps should be taken to watch the frequency 500 kHz to ensure reception of distress and other urgent transmissions which can be done by searching the band 495 to 505 kHz;
- (e) The ship's position, regularly updated, should be available and, at the order of the master, be prominently displayed at the operating position;
- (f) Distress, urgency and safety messages should be passed to the officer in charge of the navigational watch, immediately on receipt;
- (g) Routine weather and navigational warning messages for the area the ship is traversing and, at the request of the master, for other areas, should be passed to the officer in charge of the navigational watch immediately on receipt;
- (h) On ships participating in a ship position-reporting system, relevant position messages, authorized by the master, should be sent as necessary;
- (i) Radiotelephone watchkeeping should be maintained as determined by the Administration;
- (j) Authorized transmissions, especially those made during silence periods or during distress transmissions, and any harmful interference incidents should, if possible, be identified, logged and brought to the attention of the Administration, with an appropriate extract from the radio log in compliance with the Radio Regulations;
- (k) The radio watchkeeper's duties should be so arranged that the efficiency of the watchkeeper is not impaired by fatigue and he is rested and otherwise fit when going on duty;
- (l) Precautions should be taken to ensure that the radio watchkeeper's hearing is not damaged by exposure to excessive extraneous noises on the ship. When unavoidably exposed to excessive noise, hearing protection devices should be worn.

B. *Operational guidance relating to safety radio watchkeeping and maintenance*

General

7. Before the commencement of a voyage, the radio operator in charge should ensure that:

- (a) All radio equipment for which the radio operator is responsible is in an efficient working condition and accumulator batteries are sufficiently charged;
- (b) All documents and supplements required by international agreements, notices to ship radio stations and additional documents required by the controlling Administration are available and discrepancies are reported to the master;
- (c) The radio room clock is accurate;
- (d) Antennae are correctly positioned, undamaged and properly connected.

8. The radio operator should ensure that all relevant documents are corrected and amended in accordance with the latest supplements.

9. When the radio operator first joins a ship, he should ensure that all technical manuals, spares, test instruments and tools for the radiocommunication equipment and, at the discretion of the master, for radio navigational equipment are on board. Discrepancies should be reported to the master.

Watchkeeping duties

10. *Radiotelegraph.* (a) Immediately prior to sailing from a port, the radio operator should, where practicable, update routine weather and navigational warning messages for the area the ship will be traversing and, at the request of the master, for other areas and pass such messages to the master.

- (b) On sailing from a port and opening the station, the radio operator should:
- (i) Listen on the distress frequency 500 kHz for a possible existing distress situation;
 - (ii) Send TR (name, position and destination, etc.) to the local coast station and other appropriate coast stations from which traffic may be expected;
 - (iii) Copy weather forecasts and navigational warnings on the first relevant transmissions.
- (c) When the station is open, the radio operator should:
- (i) Enable chronometer checks to be made by relaying time signals to the chartroom at least once a day;
 - (ii) Check the radio room clock against standard time signals at least once a day;
 - (iii) On selected ships endeavour to clear as many of the OBS (weather report) messages as are available, via relevant coast stations, during watchkeeping hours;
 - (iv) Send a TR when entering the area of a medium frequency or other coast station from which traffic might be expected; the coast station concerned should be informed on leaving its service area;
 - (v) As far as possible, listen to traffic lists transmitted by coast stations from which traffic might be expected; on hearing his ship's call sign, reply as soon as possible.
- (d) When closing the station on arrival at a port, the radio operator should:
- (i) Advise the local coast station and other coast stations with which contact has been maintained of the ship's arrival and closing of the station;
 - (ii) Ensure that antennae are earthed;
 - (iii) Check that accumulator batteries are sufficiently charged.

11. *Radiotelephone.* (a) Whenever a radio watch on 2,182 kHz is being kept in the radio room, this frequency should be monitored for distress, urgency or safety transmissions.

(b) Where any such transmissions are intercepted, the procedure detailed in the relevant sections of paragraphs 12, 13 and 14 should be followed.

(c) Times of opening and closing any monitoring watch on 2,182 kHz and details of any distress, urgency or safety traffic, which are not repetitions of those already heard on 500 kHz, should be entered in the radio log.

Action to be taken in cases of distress, urgency and safety

12. *Distress.* The distress call should have absolute priority over all other transmissions. All stations which hear it should immediately cease any transmissions capable of interfering with distress traffic.

- (a) In cases of distress affecting own ship, the radio operator should:
- (i) Obtain from the bridge the ship's actual or estimated position or, if not available, use the last known position or the true bearing and distance from a fixed geographical position; when using the last known position, time of such position should be stated in GMT;
 - (ii) Normally transmit on 500 kHz using the radiotelegraph distress procedure in accordance with the Radio Regulations; the distress call and message should be sent only on the authority of the master or person responsible for the ship; other suitable international distress frequencies (or other frequencies), if necessary, may be used in accordance with the Radio Regulations;
 - (iii) Repeat at intervals, especially during silence periods, the distress message, preceded by the alarm signal, if necessary, and the distress call, until an answer is received;
 - (iv) If no answer is received to a distress message sent on a distress frequency, repeat the message on any other available frequency on which attention might be attracted;
 - (v) Use any means in order to attract attention;
 - (vi) Pass to the master all distress communications immediately on receipt;

- (vii) If the ship has to be abandoned before being located by other ships, set the radio apparatus for continuous emission, if considered necessary and circumstances permit.
- (b) In cases of distress affecting other ships, the radio operator should:
- (i) Copy the message and pass it to the bridge;
 - (ii) At the same time, if possible, ensure that a direction finder bearing is obtained; if the bearing is relative, the ship's heading should also be noted;
 - (iii) If, beyond any doubt, his ship is in the vicinity of the distress, immediately acknowledge receipt; in areas where reliable communications with coast stations are practicable, defer acknowledgement for a short interval so that a coast station may acknowledge receipt;
 - (iv) If, beyond any doubt, his ship is not in the vicinity of the distress, allow a short interval of time to elapse before acknowledging receipt of the message to permit nearer stations to acknowledge receipt without interference;
 - (v) Not acknowledge receipt:
 - (1) When his ship is a long distance away from the distress and not in a position to render assistance except when a distress message is heard which has not been acknowledged;
 - (2) Of a distress message transmitted by a coast station until the master has confirmed that the ship is in a position to render assistance;
 - (vi) In the case indicated in sub-paragraph (v)(1); and when:
 - (1) It has been learned that a ship in distress is not itself in a position to transmit a distress message; or
 - (2) The master considers that further help is necessary; or
 - (3) An emergency position-indicating radio beacon signal has been received while no distress or urgency traffic is being passed;
transmit a distress message using the appropriate transmitter on full power, whenever possible preceded by the alarm signal, using the DDD procedures on 500 kHz or "May-day Relay" procedures on 2,182 kHz or 156.8 MHz, as appropriate, or on any other frequency which may be used in case of distress and take all other steps, as if it were own ship in distress, to notify authorities who may be able to render assistance;
 - (vii) On the order of the master, transmit as soon as possible own ship's name, position, speed and estimated time of arrival at the distress position, and, if the position of the ship in distress appears doubtful, the true bearing of the ship in distress preceded by the abbreviation QTE and classification of the bearing;
 - (viii) Record and pass to the bridge other acknowledgements, positions and times of arrival and other relevant distress traffic;
 - (ix) If control of distress traffic is taken over by a coast station or a ship more favourably placed to assist the one in distress, normally work with that control station;
 - (x) Remain on continuous watch until the distress ends; if adequate assistance is being provided by closer ships or contact has been made with coast stations and no possibility exists of being required to provide relay facilities or specialized advice, normal watch may be resumed.
13. *Urgency.* (a) In cases of urgency affecting own ship the radio operator should:
- (i) Using the radiotelegraph urgency procedure, send, only on the authority of the master, the urgency signal and message on 500 kHz or on any other frequency which may be used in case of distress. In the case of a long message, or a medical call, or when repeating the message in areas of heavy traffic, transmit the message on a working frequency. In such cases include in the call details of the frequency on which the urgency message will be transmitted;

- (ii) If the urgency message concerns the loss of a person or persons overboard, be permitted to precede the call by the alarm signal, only when the assistance of other ships is required and cannot be satisfactorily obtained by the use of the urgency signal;
 - (iii) If the message is addressed to a particular station, establish contact with that station before transferring to a working frequency;
 - (iv) If the message is addressed to all stations, allow a reasonable period before repeating the call and transmitting the message;
 - (v) When an urgency addressed to all stations is ended and action is no longer necessary, send a message of cancellation on the relevant frequency addressed to all stations.
- (b) In cases of urgency affecting other ships, the radio operator should:
- (i) As the urgency signal has priority over all other communications except distress, take care not to interfere with it or the transmission of the message that follows the urgency signal;
 - (ii) Copy the message and pass it to the bridge;
 - (iii) Continue to listen for at least three minutes; at the end of that period, if no urgency message has been heard, notify a coast station, if possible, of the receipt of the urgency signal; thereafter resume normal working;
 - (iv) If the urgency signal is addressed to a particular station, be permitted to continue working on frequencies other than that in use for the transmission of the urgency signal or urgency message; all assistance should be given, if required, in the clearance of the urgency message to the addressee, for example by re-transmission.

14. *Safety.* (a) When a safety message is to be transmitted, the radio operator should:

- (i) Send the safety signal towards the end of the first available silence period and call on one or more of the international distress frequencies (500 kHz, 2,182 kHz and 156.8 MHz where applicable) or on any other frequency which may be used in case of distress;
 - (ii) Immediately after the end of the silence period send the safety message which follows the call on a working frequency making a suitable announcement to this effect at the end of the call; outside regions of heavy traffic short safety messages may be sent exceptionally on the frequency 500 kHz;
 - (iii) Transmit safety calls and messages, which contain important meteorological and navigational warnings, as soon as possible and repeat them at the end of the first silence period that follows.
- (b) On hearing the safety signal,* the radio operator should:
- (i) Not interfere with the signal or message;
 - (ii) Copy the message and pass it to the bridge;
 - (iii) Give every assistance in disseminating, as necessary, such messages when addressed to "all ships" and re-transmit to the addressee messages of a more limited nature, if so requested.

Other duties

15. *Log keeping.* (a) The radio log should be kept in compliance with the requirements of the Radio Regulations and Safety Convention.

(b) The radio log should be kept in the radio room and should be available for inspection by authorized officials of the Administration; the times of all entries should be recorded in GMT.

* A coast station may broadcast an urgent cyclone warning as a safety message preceded by the alarm signal and the safety signal.

(c) The radio log should at all times be available for inspection by the master and the radio operator should call his attention to any entry important to safety.

16. *Essential tests.* While the ship is at sea tests should be made by the radio operator in accordance with the Safety Convention. In addition, the following should be carried out to facilitate early detection of developing faults:

- (a) At least once a week check the automatic keying device for signal formation and timing;
- (b) At regular intervals check all metered test points in the radiocommunication equipment and record abnormalities;
- (c) When possible test the portable and fixed radio apparatus in a survival craft afloat; in any event every three months test the portable and fixed radio apparatus in a survival craft on board ship; when the tests are undertaken with the antenna rigged, efforts should be made to establish contact with other ships or coast stations provided no interference is caused to other transmissions; when non-chargeable batteries are used in the survival craft radio equipment they should be replaced at the intervals recommended by the manufacturers or earlier if performance on test is degraded;
- (d) At intervals, when within sight of a radio beacon, in co-operation with a navigating officer, check bearings should be taken to verify the accuracy of the direction finder calibration curve on as many ship's headings as possible; the results should be recorded and reported to the master; possible shipboard causes of errors, including alteration to wire rigging and unauthorized antennae should be sought and reported to the master.

17. *Demonstration of portable radio apparatus for survival craft.* Whenever possible, the operation of the portable radio apparatus for survival craft should be demonstrated to new crew members in order to familiarize them in its use. When the apparatus is tested in survival craft, the rigging and operation of it should be demonstrated to as many crew members as possible.

18. *Demonstration of reserve radiotelegraph equipment.* Where Administrations require an instruction chart and related numbering indicators on the reserve radiotelegraph equipment, including automatic keying devices, suitable persons designated by the master to use such equipment in an emergency when the radio operator is incapacitated for any reason, should be given demonstrations in such procedure at appropriate intervals.

19. *Maintenance.* Maintenance consists of simple repairs only.

ANNEX IV. RECOMMENDATION ON TRAINING FOR RADIO OPERATORS — MINIMUM LEVELS OF TRAINING IN MARITIME SAFETY RADIOCOMMUNICATIONS

General

1. Before training is commenced, the requirements of medical fitness, especially as to hearing, eyesight and speech should be met by the candidate.

2. The training should be relevant to the provisions of the Radio Regulations annexed to the International Telecommunication Convention* and International Convention for the Safety of Life at Sea,** then in force, with special attention to the most recent developments in maritime radiocommunications technology and radiocommunications systems. In developing the programme account should be taken of, but not limited to, the following items.

Theory

3. The outline syllabus is shown in the Appendix to this Recommendation.

* Hereinafter referred to as the Radio Regulations.

** Hereinafter referred to as the Safety Convention.

Practical

4. Practical training should be given in:

- (a) Basic understanding of circuit diagrams;
- (b) Use and care of those tools and test instruments required to be carried by the Safety Convention;
- (c) Soldering and de-soldering techniques, including those involving semi-conductor devices and modern circuits;
- (d) Operation and adjustment of shipborne radiocommunication equipment;
- (e) Operation and essential maintenance of portable radio apparatus for survival craft;
- (f) Logical location of elementary faults;
- (g) Remedying of simple faults;
- (h) Essential maintenance procedures;
- (i) Elementary direction finder calibration procedures and taking of direction finder bearings;
- (j) Elementary methods of shielding receivers from electrical and electromagnetic interference;
- (k) Antenna rigging, repair and maintenance considerations;
- (l) Safety procedures;
- (m) Operation and maintenance of sources of energy such as rotating machinery, inverters and accumulator batteries.

Radiocommunication techniques

5. Training should be given in:

- (a) Operational techniques, including the following:
 - (i) Sending and receiving Morse Code with the objective of achieving the requirements of the Radio Regulations;
 - (ii) Receiving Morse Code under typical interference conditions (real or recorded);
 - (iii) Use of filter circuits and adjustment of the beat frequency oscillator (BFO) to improve reception of a desired signal under conditions of severe interference;
 - (iv) Receiver tuning techniques for single side-band signals;
 - (v) Transmitter tuning and antenna adjustment techniques;
 - (vi) Receiver tuning techniques for reception of frequency shift signals including facsimile and selective calling;
- (b) Radiotelegraph watchkeeping, exchange of radiotelegraph traffic, particularly concerning distress, urgency and safety procedures and log-keeping, including use of service abbreviations and Q-code;
- (c) Radiotelephone watchkeeping, exchange of radiotelephone traffic, particularly concerning distress, urgency and safety procedures and log-keeping, including use of the international phonetic alphabet and figure code;
- (d) Use of the International Code of Signals and the IMCO Standard Marine Navigational Vocabulary;
- (e) Communications procedures of the IMCO Merchant Ship Search and Rescue Manual (MERSAR), using radiotelegraphy and radiotelephony;
- (f) Ship position-reporting systems and procedures;
- (g) Radio medical systems and procedures;
- (h) Procedures to establish optimum frequencies for high frequency communications;
- (i) Use of high frequency calling frequencies;

- (j) Monitoring a distress frequency while simultaneously monitoring or working on at least one other frequency.

Regulatory

6. Training should be based on the requirements of the Radio Regulations and the Safety Convention, in particular those sections which relate to:

- (a) Distress, urgency and safety radiocommunications;
- (b) Avoidance of causing harmful interference, particularly with distress traffic;
- (c) Documents to be carried by ship stations and their use.

Miscellaneous

7. It is recommended that:

- (a) The English language be taught to a suitable level within the limits necessary for exchange of radiotelephone and radiotelegraph communications relevant to the safety of life at sea;
- (b) Training be given in personal survival techniques and in the practical use of life-saving equipment;
- (c) Training include an approved fire-fighting course with emphasis on methods of extinguishing fires in the radio room and causing as little damage to the radio installation as possible.

APPENDIX. OUTLINE SYLLABUS COVERING THE THEORY OF MARITIME SAFETY RADIOCOMMUNICATION

1. *Elementary knowledge of electricity and radiocommunication*

- (a) Electricity, primary and secondary cells;
- (b) Electromagnetism, inductance;
- (c) Electrostatics, capacitance;
- (d) Alternating current, transformers and machines;
- (e) Function of thermionic valves and semi-conductor devices;
- (f) Meters and measurements;
- (g) Principles of radiocommunications.

2. *Maritime radiocommunication*

- (a) Elementary knowledge of power supplies;
- (b) Appreciation of the function of audio frequency and radio frequency amplifiers, oscillators, modulation methods, frequency changing and signal detection;
- (c) Elementary knowledge of propagation of radio waves, types of antennae;
- (d) Elementary block diagrams of transmitters, receivers, direction finders, auto alarms (radiotelegraph and radiotelephone) and portable radio apparatus for survival craft, including emergency position-indicating radio beacons (EPIRBs);
- (e) Knowledge of the function of automatic keying devices.

RESOLUTION 8. ADDITIONAL TRAINING FOR RATINGS FORMING PART OF A NAVIGATIONAL WATCH

The Conference,

Considering the need to enhance the proficiency of ratings forming part of a navigational watch,

Realizing that such enhancement should be brought about by training in subjects additional to those encompassed by Mandatory Minimum Requirements for Ratings Forming Part of a Navigational Watch of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978,

Resolves to recommend that ratings forming part of a navigational watch be trained in:

- (a) Use and operation of bridge equipment appropriate to their duties, and
 - (b) The basic requirements for prevention of pollution of the marine environment,
- Urges all Governments concerned to give effect to the contents of this Resolution as soon as possible.

RESOLUTION 9. MINIMUM REQUIREMENTS FOR A RATING NOMINATED
AS THE ASSISTANT TO THE ENGINEER OFFICER IN CHARGE OF THE WATCH

The Conference,

Recognizing the importance and urgency of establishing requirements for ratings having special responsibilities when forming part of an engine room watch,

Recognizing that suitable arrangements for the training of ratings having special responsibility when forming part of an engine room watch are not widely available,
Resolves:

- (a) To adopt the Recommendation on Minimum Requirements for a Rating Nominated as the Assistant to the Engineer Officer in Charge of the Watch, annexed to this Resolution;
- (b) To urge all Governments concerned to give effect to the contents of this Recommendation as soon as practicable,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep this Recommendation under review and to bring any future amendments to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX. RECOMMENDATION ON MINIMUM REQUIREMENTS FOR A RATING NOMINATED
AS THE ASSISTANT TO THE ENGINEER OFFICER IN CHARGE OF THE WATCH

1. Every rating who is nominated as the assistant to the engineer officer in charge of the watch on sea-going ships and having specific duties and responsibilities relating to these duties in connexion with the safe operation and servicing of machinery, should meet the following minimum requirements to the satisfaction of the Administration:

- (a) Be not less than 17 years of age;
- (b) Medical fitness, including eyesight and hearing;
- (c) Training regarding fire-fighting, basic first aid, personal survival, health hazards and personal safety;
- (d) Sea-going service in an engine room capacity for at least 12 months, half of which may be replaced by approved training;
- (e) Have met the requirements of Regulation III/6, "Mandatory Minimum Requirements for Ratings Forming Part of an Engine Room Watch", of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978.

2. Every such rating should possess:

- (a) Knowledge of the function, operation and servicing of main propulsion and auxiliary machinery;
- (b) Knowledge of engine room watchkeeping procedures and the ability to carry out a watch routine;
- (c) Knowledge of use of hand tools and portable power tools;
- (d) Ability to read indicating instruments related to his watchkeeping duties and understand the significance of the readings;
- (e) Knowledge of the function, operation and servicing of the various pumping systems;
- (f) Knowledge of safe working practices related to engine room operations;
- (g) Knowledge of technical terms used in the machinery spaces and names of all relevant machinery details and equipment.

3. Every such rating forming part of an engine room watch should be familiar with his watchkeeping duties in the machinery spaces. In particular, with respect to his duties on any ship the rating should have:

- (a) Knowledge of the use of appropriate internal communication systems;
- (b) Knowledge of escape routes from machinery spaces;
- (c) Knowledge of engine room alarm systems and ability to distinguish between the various alarms, with special reference to fire extinguishing gas alarms;
- (d) Familiarity with the location and use of fire-fighting equipment in the machinery spaces;
- (e) Familiarity with environmental protection equipment;
- (f) Ability to understand and make himself understood by the engineer officer in charge of the watch.

4. Administrations should ensure that authorized documents are issued to seafarers who are qualified in accordance with paragraphs 1 and 2 of this Recommendation or that their existing documents are duly endorsed.

5. A seafarer may be considered by the Administration to have met the requirements of this Recommendation, if he has served in a relevant capacity in the engine department for a period of not less than one year within the last five years preceding the implementation of this Recommendation by that Administration.

RESOLUTION 10. TRAINING AND QUALIFICATIONS OF OFFICERS AND RATINGS OF OIL TANKERS

The Conference,

Being aware of the possible dangers to human life and to the environment from accidents involving the handling of oil in bulk,

Recognizing the importance and urgency of establishing requirements for officers and key ratings having special responsibilities for the handling of oil in bulk,

Noting Resolution 8 of the International Conference on Tanker Safety and Pollution Prevention, 1978,

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

Resolves:

- (a) To adopt the Recommendation on Training and Qualifications of Officers and Ratings of Oil Tankers, annexed to this Resolution;

- (b) To urge all Governments concerned to give effect to the contents of this Recommendation as soon as practicable,
Invites the Inter-Governmental Maritime Consultative Organization:
- (a) To keep this Recommendation under review and to bring any future amendments to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX. RECOMMENDATION ON TRAINING AND QUALIFICATIONS
OF OFFICERS AND RATINGS OF OIL TANKERS

I. *Training of officers and ratings having specific duties and responsibilities in connexion with cargo and cargo equipment*

Training should be divided into two parts, a general part concerning principles involved, and a part on the application of those principles to ship operation. Any of this training may be given at sea or ashore. Such training should be supplemented by practical instruction at sea and, where appropriate, in a suitable shore-based installation. All training and instruction should be given by properly qualified personnel.

A. *Principles*

1. *Characteristics of oil cargoes.* An outline treatment including practical demonstration of the physical properties of oil carried in bulk; vapour pressure/temperature relationship. Influence of pressure on boiling temperature. Explanation of saturated vapour pressure, diffusion, partial pressure, flammability limit, explosive limits, petroleum vapour, vapour travel, flashpoint and auto-ignition temperature. Practical significance of flashpoint and lower flammable limit. Simple explanation of types of electrostatic charge generation.

2. *Toxicity.* Simple principles and explanations of basic concepts; toxicity limits, both acute and chronic effects of toxicity, systemic poisons and irritants.

3. *Hazards*

(a) *Explosion and flammability hazards.* Flammability limits. Sources of ignition and explosion. Danger from vapour cloud drift.

(b) *Health hazards.* Dangers of skin contact, inhalation and ingestion.

(c) *Hazards to the environment.* Effect on human and marine life from release of oil at sea. Effect of specific gravity and solubility. Effect of vapour pressure and atmospheric conditions.

(d) *Corrosion hazards*

4. *Hazard control.* Inerting, monitoring techniques, anti-static measures, ventilation, segregation and the importance of compatibility of materials.

5. *Safety equipment and protection of personnel.* The function and calibration of gas measuring instruments and similar equipment. Specialized fire extinguishing appliances, breathing apparatus and tank evacuating equipment. Safe use of protective clothing and equipment.

B. *Shipboard application*

1. *Regulations and codes of practice.* Importance of developing ships' emergency plans. Familiarization with:

- (a) The appropriate provisions of relevant international conventions;
- (b) International and national codes;

(c) IMCO Manual on Oil Pollution;

(d) Relevant tanker safety guides.*

2. *Ship design and equipment of oil tankers.* Familiarization with:

(a) Piping, pumping, tank and deck arrangements;

(b) Types of cargo pumps and their application to various types of cargo;

(c) Tank cleaning, gas freeing and inerting systems;

(d) Cargo tank venting and accommodation ventilation;

(e) Gauging systems and alarms;

(f) Cargo heating systems;

(g) Safety factors of electrical systems.

3. *Ship operations.* Cargo calculations. Loading and discharging plans. Loading and discharge procedure including ship-to-ship transfers. Check lists. Use of monitoring equipment. Importance of proper supervision of personnel. Gas freeing operations and tank cleaning operations. Where appropriate, crude oil washing procedures and the operation and maintenance of inert gas systems. Control of entry into pumprooms and enclosed spaces. Use of gas detecting and safety equipment. Load-on-top and proper ballasting and de-ballasting procedures. Air and water pollution prevention.

4. *Repair and maintenance.* Precautions to be taken before and during repair and maintenance work including that affecting pumping, piping, electrical and control systems. Safety factors necessary in the performance of hot work. Control of hot work and proper hot work procedures.

5. *Emergency operations.* Emergency plan. Cargo operations emergency shutdown. Action in the event of failure of services essential to cargo. Fire-fighting on oil tankers. Action following collision, stranding or spillages. First aid procedures and the use of resuscitation equipment. Use of breathing apparatus. Rescue from enclosed spaces.

Note. It is recommended that as great a use as possible should be made of shipboard operations and equipment manuals, films and suitable visual aids, and that the opportunity should be taken to introduce discussion of the part to be played by safety organization on board ship, and the role of safety officers and safety committees.

II. *Training of other personnel*

Such personnel should undergo training on board ship and, where appropriate, ashore, which should be given by qualified personnel experienced in the handling and characteristics of oil cargoes and safety procedures.

1. *Regulations.* Knowledge of the ship's rules and regulations governing the safety of personnel on board a tanker in port and at sea.

2. *Health hazards and precautions to be taken.* Dangers of skin contact. Inhalation and accidental swallowing of cargo. Oxygen deficiency with particular reference to inert gas systems. The harmful properties of cargoes carried. Personnel accidents and associated first aid. Lists of dos and don'ts.

3. *Fire prevention and fire-fighting.* Control of smoking and cooking restrictions. Sources of ignition. Fire and explosion prevention. Methods of fire-fighting. Outline of portable apparatus and fixed installations.

4. *Pollution prevention.* Procedures to be followed to prevent air and water pollution. Measures to be taken in the event of spillage.

5. *Safety equipment and its use.* The proper use of protective clothing and equipment, resuscitators, escape and rescue equipment.

* Reference is made to the joint ICS/OCIMF International Safety Guide for Oil Tankers and Terminals and the ICS Guide to Helicopter/Ship Operations.

6. *Emergency procedures.* Familiarization with emergency plan procedures.

7. *Cargo equipment and operations.* General description of cargo handling equipment. Safe loading and discharge procedures and precautions. Safe entry into enclosed spaces.

III. *Fire-fighting training*

All personnel should have attended an approved basic or advanced practical fire-fighting training course relevant to their duties and responsibilities.

RESOLUTION 11. TRAINING AND QUALIFICATIONS OF OFFICERS AND RATINGS OF CHEMICAL TANKERS

The Conference,

Being aware of the possible dangers to human life and to the environment from accidents involving the handling of chemicals in bulk,

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

Having considered Resolution A.286(VIII)¹ adopted by the Assembly of the Inter-Governmental Maritime Consultative Organization on this matter,

Noting that the subject matter of Resolution A.286(VIII) is closely related to the aims of the Conference,

Resolves:

- (a) To adopt the Recommendation on Training and Qualifications of Officers and Ratings of Chemical Tankers, annexed to this Resolution;
- (b) To urge all Governments concerned to give effect to the contents of this Recommendation as soon as practicable,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep this Recommendation under review and to bring any future amendments including provisions concerning the handling of hazardous or noxious dry chemicals in bulk, to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX. RECOMMENDATION ON TRAINING AND QUALIFICATIONS OF OFFICERS AND RATINGS OF CHEMICAL TANKERS

I. *Training of officers and ratings responsible for cargo handling and equipment*

Training should be divided into two parts, a general part on principles involved and a part on the application of the principles to ship operation. Any of this training may be given at sea or ashore. Such training should be supplemented by practical instruction at sea and, where appropriate, in a suitable shore-based installation. All training and instruction should be given by properly qualified personnel.

A. *Principles*

1. *Elementary physics.* An outline treatment including practical demonstration of the physical properties of chemicals carried in bulk; vapour pressure/temperature relationship.

¹ Inter-governmental Maritime Consultative Organization, *Resolutions and Other Decisions, Eighth Session, 13-23 November 1973*, p. 199.

Influence of pressure on boiling temperature. Explanation of saturated vapour pressure, diffusion, partial pressure, flammability limit, flashpoint and auto-ignition temperature. Practical significance of flashpoint and lower flammable limit. Simple explanation of types of electrostatic charge generation.

2. *Elementary chemistry.* Chemical symbols and structures, elements of the chemistry of acids and bases, structure and properties of well known chemicals carried, chemical reaction of well known groupings, sufficient to enable proper utilization of codes.

3. *Toxicity.* Simple principles and explanation of basic concepts; toxicity limits, both acute and chronic effects of toxicity, systemic poisons and irritants.

4. *Hazards*

(a) *Explosion and flammability hazards.* Flammability limits. Sources of ignition and explosion.

(b) *Health hazards.* Dangers of skin contact, inhalation and ingestion.

(c) *Hazards to the environment.* Effect on human and marine life of release of chemicals at sea. Effect of specific gravity and solubility. Danger from vapour cloud drift. Effect of vapour pressure and atmospheric conditions.

(d) *Reactivity hazards.* Self-reaction; polymerization, effects of temperature, impurities as catalysts. Reaction with air, water and other chemicals.

(e) *Corrosion hazards.* Dangers to personnel, attacks on constructional materials. Effects of concentration. Evolution of hydrogen.

5. *Hazard control.* Inerting, water padding, drying agents, monitoring techniques. Anti-static measures. Ventilation. Segregation. Cargo inhibition. The importance of compatibility of materials.

6. *Safety equipment and protection of personnel.* The function and calibration of measuring instruments and similar equipment. Specialized fire extinguishing appliances, breathing and escape apparatus. Safe use of protective clothing and equipment.

B. *Shipboard application*

1. *Regulations and codes of practice.* Familiarization with IMCO, national and relevant international codes* and port regulations. The importance of developing ships' emergency plans.

2. *Ship design and equipment of chemical tankers.* A brief description of specialized piping, pumping and tank arrangements, overflow control. Types of cargo pumps and their application to various types of cargo. Tank cleaning and gas freeing systems. Cargo tank venting and accommodation ventilation, airlocks. Gauging systems. Tank temperature control systems. The safety factors of electrical systems.

3. *Ship operations.* Cargo calculation. Loading and discharging plans. Loading and discharge procedure. Check lists. Use of monitoring equipment. Gas freeing operations and tank cleaning operations (proper use of absorption and wetting agents and detergents). Use and maintenance of inert atmospheres. Control of entry into pumprooms and enclosed spaces. Use of detecting and safety equipment. Disposal of waste and washings.

4. *Repair and maintenance.* Precautions to be taken before the repair and maintenance of pumping, piping, electrical and control systems.

5. *Emergency operations.* Emergency plan. Cargo operations emergency shutdown. Action in the event of failure of services essential to cargo. Fire-fighting on chemical tankers. Action following collision, stranding or spillages. First aid procedure and the use of resuscitation and decontamination equipment. Use of breathing apparatus. Rescue from enclosed spaces.

* Reference is made to the ICS Tanker Safety Guide (Chemicals) and ICS Guide to Helicopter/Ship Operations.

Note. It is recommended that as much use as possible should be made of shipboard operations and equipment manuals, films and suitable visual aids, and that the opportunity should be taken to introduce discussion of the part to be played by safety organization on board ship, and the role of safety officers and safety committees.

II. *Training of other personnel*

Such personnel should undergo training on board ship and, where appropriate, ashore, which should be given by qualified personnel who have attained the required standard and are experienced in the carriage of this type of cargo and safety procedures.

1. *Regulations.* Knowledge of the ship's rules and regulations governing the safety of personnel on board a tanker in port and at sea.

2. *Health hazard and precautions to be taken.* Dangers of skin contact. Inhalation and swallowing cargo. Oxygen deficiency with particular reference to inert gas systems. The toxic properties of cargoes carried. Personnel accidents and associated first aid. Lists of dos and don'ts.

3. *Fire prevention and fire-fighting.* Control of smoking and cooking restrictions. Sources of ignition. Fire and explosion prevention. Methods of fire-fighting. Outline of portable apparatus and fixed installations.

4. *Pollution prevention.* Procedures to be followed to prevent air and water pollution. Measures to be taken in the event of spillage.

5. *Safety equipment and its use.* The proper use of protective clothing and equipment, resuscitators, escape and rescue equipment.

6. *Emergency procedures.* Familiarization with emergency plan procedure.

7. *Cargo equipment and operations.* General description of cargo handling equipment. Safe loading and discharge procedures and precautions. Safe entry into enclosed spaces.

III. *Fire-fighting training*

All personnel should have attended an approved basic or advanced practical fire-fighting training course relevant to their duties and responsibilities.

RESOLUTION 12. TRAINING AND QUALIFICATIONS OF MASTERS, OFFICERS AND RATINGS OF LIQUEFIED GAS TANKERS

The Conference,

Being aware of the possible dangers to human life and to the environment from accidents involving the handling of liquefied gases in bulk,

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

Being of the opinion that mandatory minimum requirements should be implemented as soon as practicable,

Resolves to adopt the Recommendation on Training and Qualifications of Masters, Officers and Ratings of Liquefied Gas Tankers, annexed to this Resolution, Recommends:

- (a) That all Governments concerned take account of the guidance contained in the Annex to this Resolution;
- (b) That all masters, officers and ratings aboard such ships should be required to complete approved basic training in safety, emergency procedures and fire-

fighting. Such training should be of adequate scope and duration to ensure appreciation of not only the hazards involved, but also the safety features included in the design and construction of the ship in order to preclude indecision or panic in the handling of emergencies and small casualties;

- (c) That all masters, deck and engineer officers and those ratings having specific duties and responsibilities in connexion with the cargo and cargo equipment should be required to complete approved special training courses and that such courses should be of adequate duration and supplemented by shipboard training and experience;
- (d) That all Governments concerned, in recognizing standards of proficiency, should either require separate assessment upon the conclusion of the prescribed training or accept successful completion of approved courses of training which are closely monitored and may include periodic assessment and an overall evaluation by the instructor of the performance and participation of the student;
- (e) That all Governments concerned should satisfy themselves as to the standard of competency of the officer primarily responsible for cargo and should ensure that appropriate documentation is issued to those so qualified by training and experience,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep this Recommendation under review and to bring any future amendments to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX. RECOMMENDATION ON TRAINING AND QUALIFICATIONS OF MASTERS, OFFICERS
AND RATINGS OF LIQUEFIED GAS TANKERS

I. *Introduction*

1. Training should be divided into two parts:

- (a) Supervised instruction, conducted in a shore-based facility or aboard a specially equipped ship having training facilities and special instructors for this purpose, dealing with the principles involved and the application of these principles to ship operation. In special situations Administrations may permit a junior officer or rating to be trained aboard liquefied gas tankers on which he is serving, provided that such service is for a limited period, as established by the Administration, and that such crew member does not have duties or responsibilities in connexion with cargo or cargo equipment and provided further that he is later trained in accordance with this Recommendation for any subsequent service;
- (b) Supplementary shipboard training and experience wherein the principles learned are applied to a particular type of ship and cargo containment system.

2. In drawing up an Administration-approved syllabus of training, the IMCO Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk and relevant Tanker Safety Guides* should be taken into account.

The training should be at the following levels:

A. *Masters, all officers and all ratings*

1. *Basic safety training course for gas tankers.* This training should preferably be conducted at an approved shore training establishment prior to an assignment to a ship. Alter-

* Reference is made to the *ICS Tanker Safety Guide (Liquefied Gas)* and the *ICS Guide to Helicopter/Ship Operations*.

natively, the safety training could be given in organized approved shipboard training programmes conducted by qualified personnel under the supervision and direction of the master. Such safety training should include the following:

- (a) *General*
 - (i) Types of gases carried;
 - (ii) Hazards associated with those gases which are likely to be handled;
 - (iii) General description of cargo carrying systems;
 - (iv) Loading and unloading systems including cargo vent systems;
 - (v) Design safety features and special requirements.
 - (b) *Fire prevention and fire-fighting.* Control of smoking and cooking restrictions. Sources of ignition. Fire and explosion prevention. Methods of fire-fighting. Outline of portable apparatus and fixed installations.
 - (c) *Health hazards and personnel protection*
 - (i) Hazards of skin contact and inhalation of cargo vapours or inert gas. Types of antidotes and their effects;
 - (ii) Proper use of protective clothing and breathing apparatus, resuscitators and rescue equipment and escape sets;
 - (iii) Entry into enclosed spaces.
 - (d) *Pollution prevention.* Procedures to be followed to prevent air and water pollution. Measures to be taken in the event of spillage.
 - (e) *Emergency procedures.* Basic outline of emergency plan. Procedures in case of:
 - (i) Fire;
 - (ii) Collision and stranding;
 - (iii) Liquefied gas spills or leaks;
 - (iv) Personnel casualty.
2. *Fire-fighting course to include the specific characteristics of fires aboard gas tankers*
- (a) All personnel should have attended an approved basic or advanced practical fire-fighting training course relevant to their duties and responsibilities;
 - (b) This training should be given at a shore establishment or aboard a specially equipped ship having training facilities and special instructors for this purpose.
3. As soon as new crew members have joined a ship, they should be made fully acquainted with all aspects of the emergency procedures listed.
- B. *Masters, all deck and engineer officers and those ratings having specific duties and responsibilities in connexion with cargo and cargo equipment*
1. This part should apply in full to the master, chief mate, chief engineer officer, second engineer officer and officer primarily responsible for the cargo if he is not included in the preceding four designations.
 2. The Administration may, however, permit variations in the depth of knowledge required in the following syllabus according to the duties and functions to be performed by other crew members.
 3. Specific duties and responsibilities in connexion with cargo and cargo equipment are those concerned with cargo loading or discharging, cargo care, processing or supervisory duties for the on board use of cargo and operation or maintenance of equipment related thereto.
 4. Such training should include but not necessarily be limited to:
 - (a) *Chemistry and physics.* An introduction to basic chemistry and physics as it relates to the safe carriage of liquefied gases in bulk in ships.

- (i) Properties and characteristics of liquefied gases and their vapours
 - (1) Definition of gas;
 - (2) Simple gas laws;
 - (3) Gas equation;
 - (4) Density of gases;
 - (5) Diffusion and mixing in gases;
 - (6) Compression of gases;
 - (7) Liquefaction of gases;
 - (8) Refrigeration of gases;
 - (9) Critical temperature;
 - (10) Practical significance of flashpoint;
 - (11) Upper and lower explosive limits;
 - (12) Auto-ignition temperature;
 - (13) Compatibility of gases;
 - (14) Reactivity;
 - (15) Polymerization.
 - (ii) Properties of single liquids
 - (1) Densities of liquids;
 - (2) Variation with temperature;
 - (3) Vapour pressure and temperature;
 - (4) Vaporization and boiling liquids.
 - (iii) Nature and properties of solutions
 - (1) Solubility of gases in liquids;
 - (2) Miscibility between liquids and effects of temperature change;
 - (3) Densities of solutions and dependence on temperature and concentration;
 - (4) Effects of dissolved substances on melting and boiling points;
 - (5) Hydrates, formation and dispersion;
 - (6) Hygroscopicity;
 - (7) Drying of air and other gases.
- (b) *Health hazards*
- (i) Toxicity
 - (1) Modes by which liquefied gases and their vapours may be toxic;
 - (2) Toxic properties of inhibitors and of products of combustion of both materials of construction and the liquefied gases carried;
 - (3) Acute and chronic effects of toxicity, systemic poisons and irritants;
 - (4) Threshold Limiting Value (TLV).
 - (ii) Hazards of skin contact, inhalation and ingestion.
 - (iii) First aid and administering of antidotes.
- (c) *Cargo containment*
- (i) Principles of containment systems.
 - (ii) Rules.
 - (iii) Surveys.
 - (iv) Tank construction, materials, coatings, insulation.
 - (v) Compatibility.

(d) *Operational procedures*

- (i) Regulations and codes of practice.
- (ii) Familiarization with IMCO, national and relevant international codes.*
- (iii) Port regulations.
- (iv) Importance of ship's emergency plan and allocation of responsibilities.

(e) *Pollution*

- (i) Hazards to human life and to the marine environment.
- (ii) Effect of specific gravity and solubility.
- (iii) Danger from vapour cloud drift.
- (iv) Jettisoning of cryogenic liquids.
- (v) National, international and local regulations.

(f) *Cargo handling system*

- (i) Description of main types of pumps and pumping arrangements and vapour return systems, piping systems and valves.
- (ii) Explanation of pressure, vacuum, suction, flow, head.
- (iii) Filters and strainers.
- (iv) Expansion devices.
- (v) Flame screens.
- (vi) Commonly used inert gases.
- (vii) Storage, generation, distribution systems.
- (viii) Outline of different types of systems and their safe and efficient operation and service.
- (ix) Temperature and pressure monitoring systems.
- (x) Cargo vent systems.
- (xi) Liquid re-circulation and re-liquefaction systems.
- (xii) Cargo gauging and instrumentation systems.
- (xiii) Gas detection and monitoring systems.
- (xiv) CO₂ monitoring systems.
- (xv) Cargo boil-off systems.
- (xvi) Auxiliary systems.

(g) *Ship operating procedures*

- (i) Loading and discharging preparations and procedures.
- (ii) Check lists.
- (iii) Cargo condition maintenance on passage and in harbour.
- (iv) Segregation of cargoes and procedures for cargo transfer.
- (v) Changing cargoes, tank cleaning procedures.
- (vi) Cargo sampling.
- (vii) Ballasting and de-ballasting.
- (viii) Warm up and cool down systems.
- (ix) Warm up and gas freeing procedures.
- (x) Procedures for cool down of gas free system from ambient temperature and safety precautions involved.

* Reference is made to the *ICS Tanker Safety Guide (Liquefied Gas)* and the *ICS Guide to Helicopter/Ship Operations*.

(h) *Safety practices and equipment*

- (i) Function, calibration and use of portable measuring instruments.
- (ii) Fire-fighting equipment and procedures.
- (iii) Breathing apparatus.
- (iv) Resuscitators.
- (v) Escape sets.
- (vi) Rescue equipment.
- (vii) Protective clothing and equipment.
- (viii) Entry into enclosed spaces.
- (ix) Precautions to be observed before and during repair and maintenance of cargo and control systems.
- (x) Supervision of personnel during potentially hazardous operations.
- (xi) Types and principles of certified safe electrical equipment.
- (xii) Sources of ignition.

(i) *Emergency procedures*

- (i) Emergency plan.
- (ii) Emergency shutdown of cargo operations.
- (iii) Emergency cargo valve closing systems.
- (iv) Action in the event of failure of systems or services essential to cargo.
- (v) Action in event of collisions or strandings, spillages, envelopment of ship in toxic or flammable vapour.

5. Supplementary shipboard training and experience based on the ship's operation manual should include the following systems as applicable:

(a) *Cargo handling system*

- (i) Piping systems, pumps, valves, expansion devices and vapour system.
- (ii) Service requirements and operating characteristics of the cargo handling system.
- (iii) Liquid re-circulation.

(b) *Instrumentation systems*

- (i) Cargo level indicators.
- (ii) Gas detection systems.
- (iii) Hull and cargo temperature monitoring systems.
- (iv) Various methods of transmitting a signal from a sensor to the monitoring station.
- (v) Automatic shutdown systems.

(c) *Boil-off disposal*

- (i) Use as fuel
 - (1) Compressors;
 - (2) Heat exchanger;
 - (3) Gas piping and ventilation in machinery and manned spaces.
- (ii) Principles of dual-fuel
 - (4) Boilers;
 - (5) Gas turbines;
 - (6) Diesel engines.
- (iii) Emergency venting.
- (iv) Re-liquefaction.

(d) *Auxiliary systems*

- (i) Ventilation, inerting.
- (ii) Valves
 - (1) Quick closing;
 - (2) Remote control;
 - (3) Pneumatic;
 - (4) Excess flow;
 - (5) Safety relief;
 - (6) Pressure/vacuum.

(iii) Steam systems for voids, ballast tanks, condenser.

(e) *General principles of operating the cargo handling plant*

- (i) Inerting cargo tanks and void spaces.
- (ii) Tank cool down, loading.
- (iii) Operations during loaded and ballasted voyages.
- (iv) Discharging and tank stripping.
- (v) Emergency procedures, including pre-planned action in the event of leaks, fires, collision, stranding, emergency cargo discharge, personnel casualty.

Note. It is recommended that as much use as possible should be made of shipboard operations and equipment manuals, films, visual and other suitable aids and that there should be discussion on the part that is to be played by safety organization on board ship, and the role of safety officers and safety committees. Encouragement should be given to the provision of such suitable aids to carry out a continuing and effective on board training and safety programme.

6. The officer primarily responsible for cargo should:

- (a) Be directly responsible to the master;
- (b) Have successfully completed all the required training;
- (c) Have served aboard a ship carrying liquefied gases in bulk for at least two months, such service to have:
 - (i) Been performed under the direction, supervision and training of an officer primarily responsible for cargo;
 - (ii) Included cargo transfers, both loading and discharging;
- (d) Satisfy the master as to his overall qualifications and ability.

II. *General*

1. Administrations should ensure that an authorized document is issued to every person who is by training and experience qualified in accordance with this Annex to serve as an officer primarily responsible for the cargo.

2. Under appropriate approved standards, the master of each ship should ensure that the officer primarily responsible for the cargo possesses such document and has had recent adequate practical experience aboard the appropriate type of ship to permit him to perform his duties safely.

3. The Administration should, in consultation with all those concerned, formulate or promote the formulation of an appropriate structure of refresher and updating courses.

RESOLUTION 13. TRAINING AND QUALIFICATIONS OF OFFICERS AND RATINGS OF SHIPS CARRYING DANGEROUS AND HAZARDOUS CARGO OTHER THAN IN BULK

The Conference,

Having adopted Regulations and Resolutions concerning training and watch-keeping of masters, officers and ratings of tankers carrying potentially dangerous and hazardous cargoes in bulk,

Noting Chapter VII of the International Convention for the Safety of Life at Sea, 1974, and Annex III of the International Convention for the Prevention of Pollution from Ships, 1973,¹

Noting also the rapidly growing number of dangerous and hazardous substances being shipped by sea,

Recognizing the importance and urgency of establishing training requirements for officers and ratings having special responsibilities for handling dangerous cargoes,

Being of the opinion that there is an urgent need for internationally agreed arrangements for training and qualifications of officers and ratings of ships carrying dangerous and hazardous cargo other than in bulk,

Invites the Inter-Governmental Maritime Consultative Organization to study this problem as a matter of urgency.

RESOLUTION 14. TRAINING FOR RADIO OFFICERS

The Conference,

Noting the Mandatory Minimum Requirements for Certification of Radio Officers forming part of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978,

Recognizing the need for additional requirements on training for radio officers,

Bearing in mind the provisions of the Radio Regulations annexed to the International Telecommunication Convention and of the International Convention for the Safety of Life at Sea,

Resolves:

- (a) To adopt the Recommendation on Training for Radio Officers, annexed to this Resolution;
- (b) To urge all Governments concerned to give effect to the contents of this Recommendation as soon as possible,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep this Recommendation under review, in consultation or association with other international organizations, as appropriate, particularly with the International Labour Organisation and the International Telecommunication Union, and to bring any future amendments to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

¹ United Nations, *Treaty Series*, vol. 1340, p. 61.

ANNEX. RECOMMENDATION ON TRAINING FOR RADIO OFFICERS

*Part I. MINIMUM LEVELS OF TRAINING IN MARITIME SAFETY RADIOCOMMUNICATION**General*

1. Before training is commenced, the requirements of medical fitness, especially as to hearing, eyesight and speech should be met by the candidate.

2. The training should be relevant to the provisions of the Radio Regulations annexed to the International Telecommunication Convention* and International Convention for the Safety of Life at Sea,** then in force, with special attention to the most recent developments in maritime radiocommunications technology and radiocommunications systems. In developing the programme account should be taken of, but not limited to, the following items.

Theory

3. The outline syllabus shown in the Appendix to Part I of this Recommendation should be supported by relevant laboratory or practical work.

Practical

4. Practical training should be given in:

- (a) Reading and understanding of circuit diagrams;
- (b) Use and care of those tools and test instruments required to be carried by the Safety Convention;
- (c) Soldering and de-soldering techniques, including those involving semi-conductor devices and modern circuits;
- (d) Operation and adjustment of shipborne radiocommunication equipment;
- (e) Operation and maintenance of portable and fixed radio equipment in survival craft;
- (f) Logical location of faults, emphasizing a systems approach;
- (g) Remedying of faults, including recognition of conditions contributing to the fault;
- (h) Maintenance procedures;
- (i) Direction finder calibration procedure and taking of direction finder bearings;
- (j) Methods of alleviating electrical and electromagnetic interference such as bonding, shielding and bypassing;
- (k) Antenna rigging, repair and maintenance;
- (l) Preventive measures for the safety of ship and personnel in connexion with hazards related to radio equipment including electrical, radiation, chemical and mechanical hazards;
- (m) Operation and maintenance of sources of energy such as rotating machinery, inverters and accumulator batteries.

Radiocommunication techniques

5. Training should be given in:

- (a) Operational techniques, including the following:
 - (i) Sending and receiving Morse Code with the objective of achieving the requirements of the Radio Regulations;
 - (ii) Receiving Morse Code under typical interference conditions (real or recorded);
 - (iii) Use of filter circuits and adjustment of the beat frequency oscillator (BFO) to improve reception of a desired signal under conditions of severe interference;
 - (iv) Receiver tuning techniques for single side-band signals;

* Hereinafter referred to as the Radio Regulations.

** Hereinafter referred to as the Safety Convention.

- (v) Transmitter tuning and antenna adjustment techniques;
- (vi) Receiver tuning techniques for reception of frequency shift signals including facsimile, direct printing and selective calling;
- (b) Radiotelegraph watchkeeping, exchange of radiotelegraph traffic, particularly concerning distress, urgency and safety procedures and log-keeping, including use of service abbreviations and Q-Code;
- (c) Radiotelephone watchkeeping, exchange of radiotelephone traffic, particularly concerning distress, urgency and safety procedures and log-keeping, including use of the international phonetic alphabet and figure code;
- (d) Operational procedures for narrow band direct-printing systems;
- (e) Use of the International Code of Signals and the IMCO Standard Marine Navigational Vocabulary;
- (f) Communications procedures of the IMCO Merchant Ship Search and Rescue Manual (MERSAR), using radiotelegraphy and radiotelephony;
- (g) Ship position-reporting systems and procedures;
- (h) Radio medical systems and procedures;
- (i) Use of propagation prediction tables and other procedures to establish optimum frequencies for high frequency communications;
- (j) Use of high frequency calling frequencies;
- (k) Monitoring a distress frequency while simultaneously monitoring or working on at least one other frequency.

Regulatory

6. Training should be based on the requirements of the Radio Regulations and the Safety Convention, in particular those sections which relate to:

- (a) Distress, urgency and safety radiocommunications;
- (b) Avoidance of causing harmful interference, particularly with distress traffic;
- (c) Documents to be carried by ship stations and their use.

Miscellaneous

7. It is recommended that:

- (a) The English language be taught to a suitable level within the limits necessary for exchange of radiotelephone and radiotelegraph communications relevant to the safety of life at sea;
- (b) Training be given in personal survival and in the practical use of life-saving equipment;
- (c) Training include an approved fire-fighting course with emphasis on methods of extinguishing fires in the radio room and causing as little damage to the radio installation as possible;
- (d) Basic training be given in touch typing for use in transcribing messages.

On-board training

8. During the initial sea-going periods of service the radio officer, under the guidance of the radio officer in charge, should complete an appropriate programme of planned sea-going training. The programme should include:

- (a) Priority tasks, which provide basic awareness of emergency procedures and an appropriate reaction to shipboard emergencies;
- (b) Familiarization with radiocommunication equipment, communications and operational duties;
- (c) Routine maintenance of radiocommunication and auxiliary equipment;
- (d) Administrative radio work;
- (e) Familiarization with the ship and duties of others on board.

APPENDIX. OUTLINE SYLLABUS COVERING THE THEORY
OF MARITIME SAFETY RADIOCOMMUNICATION

1. *Fundamentals of electricity and radiocommunication*

- (a) Basic electricity and direct current;
- (b) Primary and secondary cells;
- (c) Electromagnetism, inductance;
- (d) Electrostatics, capacitance;
- (e) Alternating current, including non-sinusoidal wave shapes;
- (f) Single-phase and poly-phase power supplies;
- (g) Transformers and machines;
- (h) Transducers;
- (i) Thermionic valves and semi-conductor devices;
- (j) Meters and electronic measuring instruments;
- (k) Combinational and sequential logic;
- (l) Electronic read-out devices such as nixi-tube and Light Emitting Diode;
- (m) Integrated circuits;
- (n) Audio frequency amplifiers;
- (o) Radio frequency amplifiers;
- (p) Oscillators and frequency synthesizers;
- (q) Types of modulation, frequency changing and detection;
- (r) Pulso circuits, non-sinusoidal wave shapes;
- (s) Antennae;
- (t) Electromagnetic wave propagation;
- (u) Transmission lines and antennae matching.

2. *Maritime radiocommunication and equipment*

- (a) Ship power supplies;
- (b) Transmitters;
- (c) Receivers;
- (d) Marine antenna systems, radiation and propagation;
- (e) Direction-finders and calibration procedure;
- (f) Survival craft radio apparatus, including emergency position-indicating radio beacons;
- (g) Automatic keying devices;
- (h) Automatic alarms;
- (i) Other circuits, components and systems in common use in shipborne radiocommunication equipment including radio terminal equipment.

3. *General.* Basic principles of preventive and remedial maintenance.

Part II. OUTLINE OF SUPPLEMENTARY SYLLABUS COVERING RADIO ELECTRONIC
NAVIGATIONAL EQUIPMENT AND ADDITIONAL RADIOCOMMUNICATION EQUIPMENT

When an Administration requires radio officers to possess the appropriate training or qualifications to repair and maintain additional radiocommunication equipment or radio-electronic navigational equipment, the programme should include, as appropriate, the following items:

1. *Direct printing and data techniques*
 - (a) Fundamental principles;
 - (b) Power supplies;
 - (c) Methods of error protection including ARQ and forward error correcting;
 - (d) Effect of noise and propagation conditions;
 - (e) Auxiliary equipment such as tape reader, perforator, teleprinter, error correcting device and voice frequency telegraphy.
2. *Selective calling systems*
 - (a) Fundamental principles;
 - (b) Effect of noise and propagation conditions;
 - (c) Read-out devices;
 - (d) Auxiliary equipment.
3. *Facsimile*
 - (a) Fundamental principles;
 - (b) Transducers;
 - (c) Modulation systems;
 - (d) Reproduction;
 - (e) Recorder circuits;
 - (f) Synchronization;
 - (g) Picture faults.
4. *Satellite equipment*
 - (a) Radiocommunications:
 - (i) Fundamental principles;
 - (ii) Antennae;
 - (iii) Transmitters and receivers;
 - (iv) Modems and interfaces.
 - (b) Radiodetermination techniques:
 - (i) Fundamental principles;
 - (ii) Systems;
 - (iii) Equipment;
 - (iv) System errors.
5. *Radar*
 - (a) Fundamental principles;
 - (b) Power supplies;
 - (c) Initiation and synchronizing circuits;
 - (d) Cathode ray tubes;
 - (e) Time base circuits;
 - (f) Brightening and blanking circuits;
 - (g) Bearing transmission systems;
 - (h) Ranging circuits;
 - (i) Azimuth stabilization circuits;
 - (j) Waveguides;
 - (k) Microwave oscillators;
 - (l) Radar transmitters;

- (m) Radar receivers;
- (n) Anti-clutter circuits;
- (o) Radar antenna and propagation;
- (p) Navigational aspects such as relative and true motion.

6. *Radio navigational computers*

- (a) Fundamental principles;
- (b) Input, interfaces for speed and course;
- (c) Data storage and retrieval;
- (d) Displays;
- (e) Programmes, including prediction.

7. *Hyperbolic systems*

- (a) Fundamental principles;
- (b) Characteristics of different makes and systems;
- (c) System errors.

8. *Echo sounding equipment*

- (a) Fundamental principles;
- (b) Methods of displaying information;
- (c) Transducers;
- (d) Transmitter and receiver systems such as pulse and doppler;
- (e) Factors affecting quality and accuracy of soundings.

9. *Television*

- (a) Fundamental principles;
- (b) Camera systems;
- (c) Scanning;
- (d) Receiver-display units;
- (e) Recording units.

10. Other systems in common use in shipborne radiocommunication and radio electronic navigational equipment.

11. With regard to the above, preventive and remedial maintenance techniques should involve the use of block diagrams, systems analysis, unit analysis and circuit analysis, using appropriate tools and test instruments, all leading to logical fault finding; performance checks should be included where appropriate.

RESOLUTION 15. TRAINING FOR RADIOTELEPHONE OPERATORS

The Conference,

Noting the Mandatory Minimum Requirements for Certification of Radiotelephone Operators forming part of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978,

Recognizing the need for additional requirements on training for radiotelephone operators,

Bearing in mind the provisions of the Radio Regulations annexed to the International Telecommunication Convention and of the International Convention for the Safety of Life at Sea,

Resolves:

- (a) To adopt the Recommendations on Training for Radiotelephone Operators, annexed to this Resolution;
 - (b) To urge all Governments concerned to give effect to the contents of these Recommendations as soon as possible,
- Invites the Inter-Governmental Maritime Consultative Organization:
- (a) To keep these Recommendations under review, in consultation or association with other international organizations, as appropriate, particularly with the International Labour Organisation and the International Telecommunication Union, and to bring any future amendments to the attention of all Governments concerned;
 - (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX I. RECOMMENDATION ON TRAINING FOR RADIOTELEPHONE OPERATORS (RESTRICTED CERTIFICATE) — MINIMUM LEVELS OF TRAINING IN MARITIME SAFETY RADIOTELEPHONE COMMUNICATIONS

General

1. Before training is commenced, the requirements of medical fitness, especially as to hearing, eyesight and speech, should be met by the candidate.

2. The training should be relevant to the provisions of the Radio Regulations annexed to the International Telecommunication Convention* and the International Convention for the Safety of Life at Sea,** then in force, with special attention to the most recent developments in maritime radiotelephone communications, and the need for a high standard of communication discipline to preserve the integrity of the international distress and safety frequencies. In developing the programme, account should be taken of, but not limited to, the following items:

Practical

3. Practical training should be given in:

- (a) Operation of shipborne radiotelephone communication equipment;
- (b) Operation of portable radio apparatus for survival craft;
- (c) Sending and receiving spoken messages by radiotelephone;
- (d) Maintenance of accumulator batteries.

Communication procedures

4. (a) Training should be given in:

- (i) Radiotelephone watchkeeping, including log-keeping;
 - (ii) Procedures concerning sending and receiving radiotelephone messages, particularly those concerning distress, urgency and safety;
 - (iii) The use of the international phonetic alphabet and figure code.
- (b) The operator should have a knowledge of:
- (i) Use of the International Code of Signals and the IMCO Standard Marine Navigational Vocabulary;
 - (ii) Ship position-reporting systems and procedures;

* Hereinafter referred to as the Radio Regulations.

** Hereinafter referred to as the Safety Convention.

- (iii) Communications procedures of the IMCO Merchant Ship Search and Rescue Manual (MERSAR), using radiotelephony;
- (iv) Radio medical systems and procedures.

Regulatory

5. Training should be based on the requirements of the Radio Regulations and the Safety Convention, in particular those sections which relate to:

- (a) Distress, urgency and safety radiotelephone communications;
- (b) Avoidance of causing harmful interference, particularly with distress traffic;
- (c) Documents to be carried by radiotelephone ship stations and their use.

Miscellaneous

6. It is recommended that:

- (a) The English language be taught to a suitable level within the limits necessary for exchange of radiotelephone communications relevant to the safety of life at sea;
- (b) Training be given in personal survival and in the practical use of life-saving equipment;
- (c) Training include an approved fire-fighting course with emphasis on methods of extinguishing fires in the radio installation and causing as little damage to it as possible.

ANNEX II. RECOMMENDATION ON TRAINING FOR RADIOTELEPHONE OPERATORS (GENERAL CERTIFICATE) — MINIMUM LEVELS OF TRAINING IN MARITIME SAFETY RADIOTELEPHONE COMMUNICATIONS

General

1. Before training is commenced, the requirements of medical fitness, especially as to hearing, eyesight and speech, should be met by the candidate.

2. The training should be relevant to the provisions of the Radio Regulations and the Safety Convention, then in force, with special attention to the most recent developments in maritime radiotelephone communications, and the need for a high standard of communication discipline to preserve the integrity of the international distress and safety frequencies. In developing the programme, account should be taken of, but not limited to, the following items.

Theory

3. A knowledge of the elementary principles of radiotelephony, in accordance with the outline syllabus in the Appendix to this Recommendation.

Practical

4. Practical training should be given in:

- (a) Operation and adjustment of shipborne radiotelephone communication equipment;
- (b) Use of instruments incorporated in the equipment;
- (c) Operation of portable radio apparatus for survival craft;
- (d) Tracing and remedying of simple faults, occurring with fuses, antennae and switches, and replacing valves, recognition of conditions contributing to the fault, with reference, as appropriate, to the relevant operator manuals;
- (e) Radio direction finding and homing, as appropriate;
- (f) Antenna rigging and maintenance considerations;
- (g) Preventive measures for the safety of ship and personnel in connexion with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards;

- (h) Maintenance of sources of energy such as rotating machinery, inverters and accumulator batteries.

Radio communication techniques

5. Training should be given in:

- (a) Operational techniques, including the following:
- (i) Receiver tuning techniques for single side-band signals;
 - (ii) Receiving under typical interference conditions (real or recorded);
 - (iii) Transmitter tuning and antenna adjustment techniques;
- (b) Radiotelephone watchkeeping, exchange of radiotelephone traffic, particularly concerning distress, urgency and safety procedures and log-keeping, including use of the international phonetic alphabet and figure code;
- (c) Use of propagation prediction tables and other procedures to establish optimum frequencies for high frequency communications;
- (d) Monitoring a distress frequency while simultaneously monitoring or working on at least one other frequency.

6. The operator should have knowledge of:

- (a) Use of the International Code of Signals and the IMCO Standard Marine Navigational Vocabulary;
- (b) Ship position-reporting systems and procedures;
- (c) Communications procedures of the IMCO Merchant Ship Search and Rescue Manual (MERSAR), using radiotelephony;
- (d) Radio medical systems and procedures.

Regulatory

7. Training should be based on the requirements of the Radio Regulations and the Safety Convention, in particular those sections which relate to:

- (a) Distress, urgency and safety radiotelephone communications;
- (b) Avoidance of causing harmful interference, particularly with distress traffic;
- (c) Documents to be carried by radiotelephone ship stations and their use.

Miscellaneous

8. It is recommended that:

- (a) The English language be taught to a suitable level within the limits necessary for exchange of radiotelephone communications relevant to the safety of life at sea;
- (b) Training be given in personal survival and in the practical use of life-saving equipment;
- (c) Training include an approved fire-fighting course with emphasis on methods of extinguishing fires in the radio installation and causing as little damage to it as possible.

APPENDIX. OUTLINE SYLLABUS OF ELEMENTARY KNOWLEDGE
OF THE PRINCIPLES OF RADIOTELEPHONY

1. *Transmitters*

- (a) Types of modulation;
- (b) Effects of under and over modulation;
- (c) Double side-band and single side-band transmissions;
- (d) Electromagnetic wave propagation;
- (e) Transmitter range.

2. *Receivers*

- (a) Superheterodyne; the function of each stage;
- (b) Frequency changing and detection;
- (c) Single side-band reception, including carrier reinsertion, frequency stability.

3. *Need for maintenance and care of*

- (a) Antennae: effect of dirty and cracked insulators; salt water spray;
- (b) Accumulator batteries: hydrometer readings, on/off load voltage readings, topping-up, terminal connexions;
- (c) Rotating machinery.

4. *Knowledge of the following would be desirable*

- (a) Thermionic valves and semi-conductor devices;
- (b) Audio frequency amplifiers;
- (c) Radio frequency amplifiers;
- (d) Oscillators;
- (e) Microphones and loudspeakers;
- (f) Antennae properties, including length, height and leakage resistance.

RESOLUTION 16. TECHNICAL ASSISTANCE FOR THE TRAINING AND QUALIFICATIONS OF MASTERS AND OTHER RESPONSIBLE PERSONNEL OF OIL, CHEMICAL AND LIQUEFIED GAS TANKERS

The Conference,

Recognizing the importance of adequate training for masters and other personnel serving on board oil, chemical and liquefied gas tankers,

Noting the requirements of paragraph 2 in each of Regulations V/1, V/2 and V/3 of the International Convention on Standards of Training, Certification and Watch-keeping for Seafarers, 1978, which prescribe mandatory minimum requirements for the training and qualifications of masters, senior officers and any other person with the immediate responsibility for loading, discharging and care in transit or handling of cargo in oil, chemical and liquefied gas tankers,

Recognizing that in some cases there may be limited facilities for obtaining the required experience and providing specialized training programmes, particularly in developing countries,

Believing that the promotion of technical co-operation on an inter-governmental level will accelerate the implementation of the Convention by States not yet having available adequate expertise or facilities for providing such training and experience,

Strongly urges Governments in a position to do so to provide, or arrange to provide, in collaboration with the Inter-Governmental Maritime Consultative Organization, assistance to States which have difficulty in meeting those requirements and request such assistance,

Invites the Inter-Governmental Maritime Consultative Organization to use all its endeavours to provide those States with the required assistance and make suitable provisions within its technical assistance programme,

Further urges that Governments and the Inter-Governmental Maritime Consultative Organization initiate action in accordance with this Resolution without awaiting the entry into force of the Convention.

RESOLUTION 17. ADDITIONAL TRAINING FOR MASTERS AND CHIEF MATES OF LARGE SHIPS AND OF SHIPS WITH UNUSUAL MANOEUVRING CHARACTERISTICS

The Conference,

Recognizing the importance of relevant experience and training before assuming the duties of master or chief mate of large ships and ships having unusual handling and manoeuvring characteristics significantly different from those in which they have recently served,

Noting that such characteristics will generally be found in ships which are of considerable deadweight, length, special design or of high speed,

Recommends that:

- (a) Prior to appointment to one of such ships masters and chief mates should:
 - (i) Be informed of that ship's handling characteristics particularly in relation to the subjects listed in paragraph 7 of the Appendix to Regulation 11/2, "Mandatory Minimum Requirements for Certification of Masters and Chief Mates of Ships of 200 Gross Register Tons or More", of the International Convention on Standards of Training, Certification and Watch-keeping for Seafarers, 1978;
 - (ii) Be thoroughly familiar with the use of all navigational and manoeuvring aids fitted in the ship concerned, including their capabilities and limitations;
- (b) Before initially assuming command of one of the ships referred to above, the prospective master should have sufficient and appropriate general experience as master or chief mate, and either:
 - (i) Have sufficient and appropriate manoeuvring experience as chief mate or supernumerary on the same ship or as master, chief mate or supernumerary on a ship having similar manoeuvring characteristics; or
 - (ii) Have attended an approved ship handling simulator course on an installation capable of simulating the manoeuvring characteristics of such a ship;
- (c) The additional training and qualifications of masters and chief mates of dynamically supported craft should be in accordance with the relevant guidelines of the IMCO Code of Safety for Dynamically Supported Craft,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep the recommendation contained herein under review, in consultation or association with other international organizations, as appropriate, particularly with the International Labour Organisation, and to bring any future amendments to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

RESOLUTION 18. RADAR SIMULATOR TRAINING

The Conference,

Recognizing the vital importance of adequate radar training with regard to the safety of life and property at sea and the protection of the environment,

Considering that some methods of instruction in the use of radar do not achieve the desired level of proficiency of masters and deck officers,

Noting that the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, requires such officers to possess an adequate level of proficiency in ship operations under all conditions of service,

Resolves to recommend that radar simulator training be given to all masters and deck officers,

Invites the Inter-Governmental Maritime Consultative Organization to communicate this Resolution to all Governments invited to the Conference,

Calls upon all Governments concerned to take due account of this Resolution as a matter of urgency.

RESOLUTION 19. TRAINING OF SEAFARERS IN PERSONAL SURVIVAL TECHNIQUES

The Conference,

Considering the need to train all seafarers in personal survival techniques,

Recognizing that such training would enhance their chance of survival at sea during emergency situations,

Resolves:

- (a) To adopt the Recommendation on Training of Seafarers in Personal Survival Techniques, annexed to this Resolution;
- (b) To urge all Governments concerned to give effect to the contents of the Recommendation as soon as practicable,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To keep this Recommendation under review, in consultation or association with other international organizations, as appropriate, particularly with the International Labour Organisation, and to bring any future amendments to the attention of all Governments concerned;
- (b) To communicate this Resolution to all Governments invited to the Conference.

ANNEX. RECOMMENDATION ON TRAINING OF SEAFARERS
IN PERSONAL SURVIVAL TECHNIQUES

Every prospective seafarer should, before being employed in a sea-going ship, receive approved training in personal survival techniques. In respect of such training, the following recommendations are made.

1. Every prospective seafarer should be instructed in the following:

- (a) Types of emergencies which may occur, such as collisions, fire and foundering;
- (b) Types of life-saving appliances normally carried on ships;
- (c) Need to adhere to the principles of survival;

- (d) Value of training and drills;
- (e) Need to be ready for any emergency and to be constantly aware of:
 - (i) The information in the muster list, in particular:
 - (1) His specific duties in any emergency;
 - (2) His own survival craft station;
 - (3) The signals calling all crew to their survival craft or fire stations;
 - (ii) Location of his own and spare life-jackets;
 - (iii) Location of fire alarm controls;
 - (iv) Means of escape;
 - (v) Consequences of panic;
- (f) Actions to be taken when called to survival craft stations, including:
 - (i) Putting on suitable clothing;
 - (ii) Donning a life-jacket;
 - (iii) Collecting additional protection such as blankets, time permitting;
- (g) Actions to be taken when required to abandon ship, such as:
 - (i) How to board survival craft from ship and water;
 - (ii) How to jump into the sea from a height and reduce the risk of injury when entering the water;
- (h) Actions to be taken when in the water, such as:
 - (i) How to survive in circumstances of:
 - (1) Fire or oil on the water;
 - (2) Cold conditions;
 - (3) Shark-infested waters;
 - (ii) How to right a capsized survival craft;
- (i) Actions to be taken when aboard a survival craft, such as:
 - (i) Getting the survival craft quickly clear of the ship;
 - (ii) Protection against cold or extreme heat;
 - (iii) Using a drogue or sea anchor;
 - (iv) Keeping a look-out;
 - (v) Recovering and caring for survivors;
 - (vi) Facilitating detection by others;
 - (vii) Checking equipment available for use in the survival craft and using it correctly;
 - (viii) Remaining, so far as possible, in the vicinity;
- (j) Main dangers to survivors and the general principles of survival, including:
 - (i) Precautions to be taken in cold climates;
 - (ii) Precautions to be taken in tropical climates;
 - (iii) Exposure to sun, wind, rain and sea;
 - (iv) Importance of wearing suitable clothing;
 - (v) Protective measures in survival craft;
 - (vi) Effects of immersion in water and of hypothermia;
 - (vii) Importance of preserving body fluids;
 - (viii) Protection against seasickness;
 - (ix) Proper use of fresh water and food;
 - (x) Effects of drinking sea water;

- (xi) Means available for facilitating detection by others;
- (xii) Importance of maintaining morale.

2. Every prospective seafarer should be given practical instruction in at least the following:

- (a) Wearing a life-jacket correctly;
- (b) Entering the water from a height wearing a life-jacket;
- (c) Swimming while wearing a life-jacket;
- (d) Keeping afloat without a life-jacket;
- (e) Boarding liferafts from ship and water while wearing a life-jacket;
- (f) Assisting others to board survival craft;
- (g) Operation of survival craft equipment including basic operation of portable radio equipment;
- (h) Streaming a drogue or sea anchor.

RESOLUTION 20. TRAINING IN THE USE OF COLLISION AVOIDANCE AIDS

The Conference,

Having adopted the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, which includes certification requirements for the training of masters and deck officers in the proper use of radar,

Noting that the International Conference on Tanker Safety and Pollution Prevention, 1978, adopted Resolution 13 which requested the Inter-Governmental Maritime Consultative Organization to develop performance standards and carriage requirements for collision avoidance aids on all ships of 10,000 tons gross tonnage and upwards not later than 1 July 1979, and also invited the attention of the Conference to the need for including appropriate provisions concerning the use of collision avoidance aids in the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978,

Recognizing that if such equipment is to be fitted on such ships, it is essential that masters and officers in charge of a navigational watch be properly trained in its use and fully aware of its capabilities and limitations,

Considering that before training requirements or recommendations can be prepared, operational performance standards and carriage requirements should first be defined,

Invites the Inter-Governmental Maritime Consultative Organization to prepare appropriate training requirements or recommendations on training in the use of collision avoidance aids when it has adopted international carriage requirements and operational performance standards for collision avoidance aids.

RESOLUTION 21. INTERNATIONAL CERTIFICATE OF COMPETENCY

The Conference,

Recognizing the importance and urgency of harmonizing the certification for masters and officers serving on board sea-going ships,

Realizing that suitable arrangements have already been made in relation to other international conventions,

Invites the Inter-Governmental Maritime Consultative Organization:

- (a) To develop a standard form and title for an international certificate of competency; and
- (b) To communicate this Resolution to all Governments invited to the Conference.

RESOLUTION 22. HUMAN RELATIONSHIPS

The Conference,

Having adopted the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978,

Recognizing that not only safe operation of the ship and its equipment but also good human relationships between the seafarers on board would greatly enhance the safety of life at sea,

Noting that the knowledge of personnel management, organization and training aboard ships is required for certification of supervisory personnel,

Recommends that this knowledge include knowledge of basic principles of human relationships and social responsibility,

Invites all Governments:

- (a) To establish or encourage the establishment of training programmes aimed at safeguarding good human relationships on board ships;
- (b) To take adequate measures to minimize any element of loneliness and isolation for crew members on board ships;
- (c) To ensure that crew members are sufficiently rested before commencing their duties.

RESOLUTION 23. PROMOTION OF TECHNICAL CO-OPERATION

The Conference,

Noting with satisfaction that the Inter-Governmental Maritime Consultative Organization has accorded, in its technical co-operation programme, the highest priority to maritime training,

Records its appreciation of the Organization's assistance to developing countries to establish maritime training facilities in conformity with global standards of training,

Invites the Organization to intensify its efforts with a view to promoting the universal acceptance and implementation of the provisions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, in regard to maritime training,

Further invites the Organization to pursue the aforesaid efforts, in consultation or association with other international organizations, as appropriate, particularly the International Labour Organisation.