

Ref. A1/V/3.02

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

**SEAFARERS' TRAINING, CERTIFICATION
AND WATCHKEEPING (STCW) CODE**

1 The Secretary-General of the International Maritime Organization has the honour to refer to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978 and to the Conference of Parties to the STCW Convention, which was held at the Headquarters of the Organization from 26 June to 7 July 1995.

2 As a result of its deliberations, recorded in the reports of the respective Committees and in the records of decisions of plenary meetings of the Conference and meetings of the Committee of the Whole, the Conference, *inter alia*, adopted the Seafarers' Training, Certification and Watchkeeping (STCW) Code, together with resolution 2 on adoption of the Code, which constitutes attachment 2 to the Final Act of the Conference.

3 The Conference (STCW/CONF/RD/2) agreed that, together with the draft Final Act, the full text of draft amendments to the STCW Convention and draft Conference resolutions would be submitted to the Plenary for adoption whilst, in respect of the STCW Code, only the text of draft amendments thereto agreed by the Committee of the Whole (STCW/CONF/DC/2 and STCW/CONF/DC/2/Corr.1) would be submitted to the Plenary for adoption and the remaining part of the Code would be adopted by reference to document STCW/CONF/5/Rev.1.

4 Taking into account the instructions of the Conference and documents STCW/CONF/5/Rev.1, STCW/CONF/DC/2 and STCW/CONF/DC/2/Corr.1, the Secretariat has prepared the full text of the STCW Code, attached hereto.

5 The attached text, which is circulated for the advance information of Parties to the STCW Convention and Member Governments, is not the authentic text of the STCW Code. The authentic text, which will exclude such detail as footnotes, will be circulated in due course.

*This (STCW.6) is a new series of STCW circulars under which future amendments to the STCW Code will be circulated.

**SEAFARERS' TRAINING, CERTIFICATION AND
WATCHKEEPING (STCW) CODE**

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**ATTACHMENT 2 TO THE FINAL ACT
OF THE CONFERENCE**

Attachment 2

RESOLUTION 2

**ADOPTION OF THE SEAFARERS' TRAINING, CERTIFICATION
AND WATCHKEEPING CODE**

THE CONFERENCE,

HAVING ADOPTED resolution 1 on Adoption of the 1995 amendments to the Annex to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978,

RECOGNIZING the importance of establishing detailed mandatory standards of competence and other mandatory provisions necessary to ensure that all seafarers shall be properly educated and trained, adequately experienced, skilled and competent to perform their duties in a manner which provides for the safety of life and property at sea and the protection of the marine environment,

ALSO RECOGNIZING the need to allow for the timely amendment of such mandatory standards and provisions in order to effectively respond to changes in technology, operations, practices and procedures used on board ships,

RECALLING that a large percentage of maritime casualties and pollution incidents are caused by human error,

APPRECIATING that one effective means of reducing the risks associated with human error in the operation of seagoing ships is to ensure that the highest practicable standards of training, certification and competence are maintained in respect of the seafarers who are employed on such ships,

DESIRING to achieve and maintain the highest practicable standards for the safety of life and property at sea and in port and for the protection of the environment,

HAVING CONSIDERED the Seafarers' Training, Certification and Watchkeeping (STCW) Code, comprised of part A - Mandatory standards regarding provisions of the Annex to the 1978 STCW Convention, as amended, and part B - Recommended guidance regarding provisions of the 1978 STCW Convention, as amended, proposed and circulated to all Members of the Organization and all Parties to the Convention,

NOTING that regulation I/1, paragraph 2, of the amended Annex to the 1978 STCW Convention provides that part A of the STCW Code supplements the regulations annexed to the Convention and that any reference to a requirement in a regulation also constitutes a reference to the corresponding section of part A of the STCW Code,

1. ADOPTS:

- .1 the Seafarers' Training, Certification and Watchkeeping (STCW) Code, part A - Mandatory standards regarding provisions of the Annex to the 1978 STCW Convention, as amended, set out in Annex 1 to the present resolution;
- .2 the Seafarers' Training, Certification and Watchkeeping (STCW) Code, part B - Recommended guidance regarding provisions of the 1978 STCW Convention, as amended, and its Annex, set out in Annex 2 to the present resolution;

2. RESOLVES:

- .1 that the provisions of part A of the STCW Code shall enter into force for each Party to the 1978 STCW Convention, as amended, on the same date and in the same manner as the amendments to that Convention adopted by the Conference;
- .2 to recommend that the guidance contained in part B of the STCW Code should be taken into account by all Parties to the 1978 STCW Convention, as amended, as from the date of entry into force of the amendments to that Convention adopted by the Conference;

3. INVITES the International Maritime Organization:

- .1 to keep the provisions of parts A and B of the STCW Code under review and consult, as may be appropriate, with the International Labour Organization, the International Telecommunication Union and the World Health Organization and to bring the need for any future amendment thereto to the attention of the Maritime Safety Committee for consideration and adoption as may be appropriate;
- .2 to communicate this resolution and any future amendment thereto that may be adopted, to the attention of all Parties to the STCW Convention.

ANNEX 1

SEAFARERS' TRAINING, CERTIFICATION AND WATCHKEEPING (STCW) CODE

PART A

**MANDATORY STANDARDS REGARDING PROVISIONS OF
THE ANNEX TO THE STCW CONVENTION**

INTRODUCTION

1 This part of the STCW Code contains mandatory provisions to which specific reference is made in the Annex to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended, hereinafter referred to as the STCW Convention. These provisions give in detail the minimum standards required to be maintained by Parties in order to give full and complete effect to the Convention.

2 Also contained in this part are standards of competence required to be demonstrated by candidates for the issue and revalidation of certificates of competency under the provisions of the STCW Convention. To clarify the linkage between the alternative certification provisions of chapter VII and the certification provisions of chapters II, III and IV, the abilities specified in the standards of competence are grouped as appropriate under the following seven functions:

- | | | | |
|----|---|----|----------------------------|
| .1 | Navigation | .2 | Cargo handling and stowage |
| .3 | Controlling the operation of the ship and care for persons on board | .4 | Marine engineering |
| .5 | Electrical, electronic and control engineering | .6 | Maintenance and repair |
| .7 | Radiocommunications | | |

at the following levels of responsibility:

- | | | | |
|----|------------------|----|-------------------|
| .1 | Management level | .2 | Operational level |
| .3 | Support level | | |

Functions and levels of responsibility are identified by subtitle in the tables of standards of competence given in chapters II, III, and IV of this part. The scope of the function at the level of responsibility stated in a subtitle is defined by the abilities listed under it in column 1 of the table.

The meaning of "function" and "level of responsibility" is defined in general terms in section A-I/1 below.

3 The numbering of the sections of this part corresponds with the numbering of the regulations contained in the Annex to the STCW Convention. The text of the sections may be divided into numbered parts and paragraphs, but such numbering is unique to that text alone.

CHAPTER I

STANDARDS REGARDING GENERAL PROVISIONS

Section A-I/1

Definitions and clarifications

1 The definitions and clarifications contained in article II and regulation I/1 apply equally to the terms used in parts A and B of this Code. In addition, the following supplementary definitions apply only to this Code:

- .1 "Standard of competence" means the level of proficiency to be achieved for the proper performance of functions on board ship in accordance with the internationally agreed criteria as set forth herein and incorporating prescribed standards or levels of knowledge, understanding and demonstrated skill;
- .2 "Management level" means the level of responsibility associated with:
 - .2.1 serving as master, chief mate, chief engineer officer or second engineer officer on board a seagoing ship, and
 - .2.2 ensuring that all functions within the designated area of responsibility are properly performed;
- .3 "Operational level" means the level of responsibility associated with:
 - .3.1 serving as officer in charge of a navigational or engineering watch or as designated duty engineer for periodically unmanned machinery spaces or as radio operator on board a seagoing ship, and
 - .3.2 maintaining direct control over the performance of all functions within the designated area of responsibility in accordance with proper procedures and under the direction of an individual serving in the management level for that area of responsibility;
- .4 "Support level" means the level of responsibility associated with performing assigned tasks, duties or responsibilities on board a seagoing ship under the direction of an individual serving in the operational or management level;
- .5 "Evaluation criteria" are the entries appearing in column 4 of the "Specifications of Minimum Standards of Competence" tables in part A and provide the means for an assessor to judge whether or not a candidate can perform the related tasks, duties and responsibilities; and
- .6 "Independent evaluation" means an evaluation by suitably qualified persons, independent of, or external to, the unit or activity being evaluated, to verify that the administrative and operational procedures at all levels are managed, organized, undertaken and monitored internally in order to ensure their fitness for purpose and achievement of stated

objectives.

Section A-I/2

Certificates and endorsements

1 Where, as provided in regulation I/2, paragraph 4, the endorsement required by article VI of the Convention is incorporated in the wording of the certificate itself, the certificate shall be issued in the format shown hereunder, provided that the words "or until the date of expiry of any extension of the validity of this certificate as may be shown overleaf "appearing on the front of the form and the provisions for recording extension of the validity appearing on the back of the form shall be omitted where the certificate is required to be replaced upon its expiry. Guidance on completion of the form is contained in section B-I/2 of this Code.

(Official Seal)

(COUNTRY)

CERTIFICATE ISSUED UNDER THE PROVISIONS OF THE INTERNATIONAL CONVENTION
ON STANDARDS OF TRAINING, CERTIFICATION AND WATCHKEEPING
FOR SEAFARERS, 1978, AS AMENDED IN 1995

The Government of certifies that has been found duly qualified in accordance with the provisions of regulation of the above Convention, as amended, and has been found competent to perform the following functions, at the levels specified, subject to any limitations indicated until or until the date of expiry of any extension of the validity of this certificate as may be shown overleaf:

FUNCTION	LEVEL	LIMITATIONS APPLYING (IF ANY)

The lawful holder of this certificate may serve in the following capacity or capacities specified in the applicable safe manning requirements of the Administration:

CAPACITY	LIMITATIONS APPLYING (IF ANY)

Certificate No. issued on

(Official Seal)

.....
Signature of duly authorized official

.....
Name of duly authorized official

The original of this certificate must be kept available in accordance with regulation I/2, paragraph 9 of the Convention while serving on a ship.

Date of birth of the holder of the certificate

Signature of the holder of the certificate

Photograph of the holder of the certificate



The validity of this certificate is hereby extended until	
(Official seal)
Signature of duly authorized official	
Date of revalidation
Name of duly authorized official	
The validity of this certificate is hereby extended until	
(Official seal)	
.....	
Signature of duly authorized official	
Date of revalidation
Name of duly authorized official	

2 Except as provided in paragraph 1, the form used to attest the issue of a certificate shall be as shown hereunder, provided that the words "or until the date of expiry of any extension of the validity of this endorsement as may be shown overleaf" appearing on the front of the form and the provisions for recording extension of the validity appearing on the back of the form shall be omitted where the endorsement is required to be replaced upon its expiry. Guidance on completion of the form is contained in section B-I/2 of this Code.

(Official Seal)

(COUNTRY)

ENDORSEMENT ATTESTING THE ISSUE OF A CERTIFICATE UNDER THE PROVISIONS OF
THE INTERNATIONAL CONVENTION ON STANDARDS OF TRAINING, CERTIFICATION
AND WATCHKEEPING FOR SEAFARERS, 1978, AS AMENDED IN 1995

The Government of certifies that certificate No. has been issued to who has been found duly qualified in accordance with the provisions of regulation of the above Convention, as amended, and has been found competent to perform the following functions, at the levels specified, subject to any limitations indicated until or until the date of expiry of any extension of the validity of this endorsement as may be shown overleaf:

FUNCTION	LEVEL	LIMITATIONS APPLYING (IF ANY)

The lawful holder of this endorsement may serve in the following capacity or capacities specified in the applicable safe manning requirements of the Administration:

CAPACITY	LIMITATIONS APPLYING (IF ANY)

Endorsement No. issued on

(Official Seal)

.....
Signature of duly authorized official

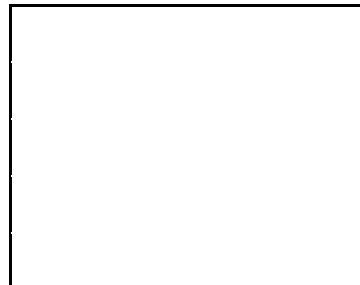
.....
Name of duly authorized official

The original of this endorsement must be kept available in accordance with regulation I/2, paragraph 9 of the Convention while serving on a ship.

Date of birth of the holder of the certificate

Signature of the holder of the certificate

Photograph of the holder of the certificate



The validity of this endorsement is hereby extended until	
(Official seal)
Signature of duly authorized official	
Date of revalidation
Name of duly authorized official	
The validity of this endorsement is hereby extended until	
(Official seal)	
.....	
Signature of duly authorized official	
Date of revalidation
Name of duly authorized official	

3 The form used to attest the recognition of a certificate shall be as shown hereunder, except that the words "or until the date of expiry of any extension of the validity of this endorsement as may be shown overleaf" appearing on the front of the form and the provisions for recording extension of the validity appearing on the back of the form shall be omitted where the endorsement is required to be replaced upon its expiry. Guidance on completion of the form is contained in section B-I/2 of this Code.

(Official Seal)

(COUNTRY)

ENDORSEMENT ATTESTING THE RECOGNITION OF A CERTIFICATE UNDER THE PROVISIONS OF
THE INTERNATIONAL CONVENTION ON STANDARDS OF TRAINING, CERTIFICATION AND
WATCHKEEPING FOR SEAFARERS, 1978, AS AMENDED IN 1995

The Government of certifies that Certificate No. issued to by or
on behalf of the Government of is duly recognized in accordance with the provisions of
regulation [I/10] of the above Convention, as amended, and the lawful holder is authorized to perform the following
functions at the levels specified, subject to any limitations indicated until or until the date of
expiry of any extension of the validity of this endorsement as may be shown overleaf:

FUNCTION	LEVEL	LIMITATIONS APPLYING (IF ANY)

The lawful holder of this endorsement may serve in the following capacity or capacities specified in the applicable
safe manning requirements of the Administration:

CAPACITY	LIMITATIONS APPLYING (IF ANY)

Endorsement No. issued on

(Official Seal)

.....
Signature of duly authorized official

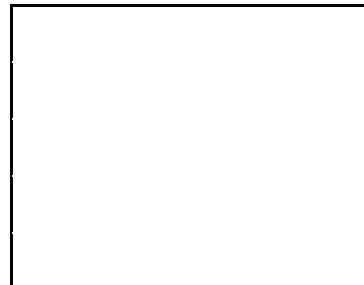
.....
Name of duly authorized official

The original of this endorsement must be kept available in accordance with regulation I/2, paragraph 9 of the
Convention while serving on a ship.

Date of birth of the holder of the certificate

Signature of the holder of the certificate

Photograph of the holder of the certificate



The validity of this endorsement is hereby extended until.....

(Official seal)

.....
Signature of duly authorized official

Date of revalidation
Name of duly authorized official

The validity of this endorsement is hereby extended until

(Official seal)

.....
Signature of duly authorized official

Date of revalidation
Name of duly authorized official

4 In using formats which may be different from those set forth in this section, pursuant to regulation I/2, paragraph 8, Parties shall ensure that in all cases:

- .1 all information relating to the identity and personal description of the holder, including name, date of birth, photograph and signature, along with the date on which the document was issued, shall be displayed on the same side of the documents; and
- .2 all information relating to the capacity or capacities in which the holder is entitled to serve, in accordance with the applicable safe manning requirements of the Administration, as well as any limitations, shall be prominently displayed and easily identified.

Section A-I/3

Principles governing near-coastal voyages

(No provisions)

Section A-I/4

Control procedures

1 The assessment procedure provided for in regulation I/4, paragraph 1.3, resulting from any of the occurrences mentioned therein shall take the form of a verification that members of the crew who are required to be competent do in fact possess the necessary skills related to the occurrence.

2 It shall be borne in mind when making this assessment that on-board procedures are relevant to the International Safety Management (ISM) Code and that the provisions of this Convention are confined to the competence to safely execute those procedures.

3 Control procedures under this Convention shall be confined to the standards of competence of the individual seafarers on board and their skills related to watchkeeping as defined in part A of this Code. On-board assessment of competency shall commence with verification of the certificates of the seafarers.

4 Notwithstanding verification of the certificate, the assessment under regulation I/4, paragraph 1.3 can require the seafarer to demonstrate the related competency at the place of duty. Such demonstration may include verification that operational requirements in respect of watchkeeping standards have been met and that there is a proper response to emergency situations within the seafarer's level of competence.

5 In the assessment, only the methods for demonstrating competence together with the criteria for its evaluation and the scope of the standards given in part A of this Code shall be used.

Section A-I/5

National provisions

The provisions of regulation I/5 shall not be interpreted as preventing the allocation of tasks for training under supervision or in cases of *force majeure*.

Section A-I/6

Training and assessment

1 Each Party shall ensure that all training and assessment of seafarers for certification under the Convention is:

- .1 structured in accordance with written programmes, including such methods and media of delivery, procedures, and course material as are necessary to achieve the prescribed standard of competence; and
- .2 conducted, monitored, evaluated and supported by persons qualified in accordance with paragraphs 4, 5 and 6.

2 Persons conducting in-service training or assessment on board ship shall only do so when such training or assessment will not adversely affect the normal operation of the ship and they can dedicate their time and attention to training or assessment.

Qualifications of instructors, supervisors and assessors*

3 Each Party shall ensure that instructors, supervisors and assessors are appropriately qualified for the particular types and levels of training or assessment of competence of seafarers either on board or ashore, as required under the Convention, in accordance with the provisions of this section.

In-service training

4 Any person conducting in-service training of a seafarer, either on board or ashore, which is intended to be used in qualifying for certification under the Convention, shall:

- .1 have an appreciation of the training programme and an understanding of the specific training objectives for the particular type of training being conducted;
- .2 be qualified in the task for which training is being conducted; and
- .3 if conducting training using a simulator:
 - .3.1 have received appropriate guidance in instructional techniques involving the use of simulators, and
 - .3.2 have gained practical operational experience on the particular type of simulator being used.

5 Any person responsible for the supervision of in-service training of a seafarer intended to be used in qualifying for certification under the Convention shall have a full understanding of the training programme and the specific objectives for each type of training being conducted.

Assessment of competence

6 Any person conducting in-service assessment of competence of a seafarer, either on board or ashore, which is intended to be used in qualifying for certification under the Convention, shall:

- .1 have an appropriate level of knowledge and understanding of the competence to be assessed;

*The following IMO Model Courses may be of assistance in the preparation of courses:

- .1 IMO Model Course 6.09 - Training Course for Instructors, Volume 1
- .2 IMO Model Course 3.12 - Examination and Certification of Seafarers

- .2 be qualified in the task for which the assessment is being made;
- .3 have received appropriate guidance in assessment methods and practice;
- .4 have gained practical assessment experience; and
- .5 if conducting assessment involving the use of simulators, have gained practical assessment experience on the particular type of simulator under the supervision and to the satisfaction of an experienced assessor.

Training and assessment within an institution

7 Each Party which recognizes a course of training, a training institution, or a qualification granted by a training institution, as part of its requirements for the issue of a certificate required under the Convention, shall ensure that the qualifications and experience of instructors and assessors are covered in the application of the quality standard provisions of section A-I/8. Such qualification, experience and application of quality standards shall incorporate appropriate training in instructional techniques, and training and assessment methods and practice, and comply with all applicable requirements of paragraphs 4 to 6.

Section A-I/7

Communication of information

1 The information required by regulation I/7, paragraph 1 shall be communicated to the Secretary-General in the formats prescribed in paragraph 2 hereunder.

2 By 1 August 1998, or within one calendar year of entry into force of regulation I/7, whichever is later for the Party concerned, each Party shall report on the steps it has taken to give the Convention full and complete effect, which report shall include the following:

- .1 the name, postal address and telephone and facsimile numbers and organization chart of the ministry, department or governmental agency responsible for administering the Convention;
- .2 a concise explanation of the legal and administrative measures provided and taken to ensure compliance, particularly with regulations I/6 and I/9;
- .3 a clear statement of the education, training, examination, competency assessment and certification policies adopted;
- .4 a concise summary of the courses, training programmes, examinations and assessments provided for each certificate issued pursuant to the Convention;
- .5 a concise outline of the procedures followed to authorize, accredit or approve training and examinations, medical fitness and competency assessments, required by the Convention, the conditions attaching thereto, and a list of the authorizations, accreditations and approvals granted;

- .6 a concise summary of the procedures followed in granting any dispensation under article VIII of the Convention; and
 - .7 the results of the comparison carried out pursuant to regulation I/11 and a concise outline of the refresher and upgrading training mandated.
 - 3 Each Party shall, within six months of:
 - .1 retaining or adopting any equivalent education or training arrangements pursuant to article IX, provide a full description of such arrangements;
 - .2 recognizing certificates issued by another Party, provide a report summarizing the measures taken to ensure compliance with regulation I/10; and
 - .3 authorizing the employment of seafarers holding alternative certificates issued under regulation VII/1 on ships entitled to fly its flag, provide the Secretary-General with a specimen copy of the type of safe manning documents issued to such ships.
- 4 Each Party shall report the results of each evaluation carried out pursuant to regulation I/8, paragraph 2 within six months of its completion, which report shall describe the terms of reference of the evaluators, their qualifications and experience, the date and scope of the evaluation, the deficiencies found and the corrective measures recommended and carried out.
- 5 The Secretary-General shall maintain a list of competent persons approved by the Maritime Safety Committee, including competent persons made available or recommended by the Parties, who may be called upon to assist in the preparation of the report required by regulation I/7, paragraph 2. These persons shall ordinarily be available during relevant sessions of the Maritime Safety Committee or its subsidiary bodies, but need not conduct their work solely during such sessions.
- 6 In relation to regulation I/7, paragraph 2, the competent persons shall be knowledgeable of the requirements of the Convention and at least one of them shall have knowledge of the system of training and certification of the Party concerned.
- 7 Any meeting of the competent persons shall:
 - .1 be held at the discretion of the Secretary-General;
 - .2 be comprised of an odd number of members, ordinarily not to exceed 5 persons;
 - .3 appoint its own chairman; and
 - .4 provide the Secretary-General with the agreed opinion of its members, or if no agreement is reached, with both the majority and minority views.
- 8 The competent persons shall, on a confidential basis, express their views in writing on:
 - .1 a comparison of the facts reported in the information communicated to the Secretary-General by the Party, with all relevant requirements of the Convention;
 - .2 the report of any relevant evaluation submitted under regulation I/8, paragraph 3; and

- .3 any additional information provided by the Party.

9 In preparing the report to the Maritime Safety Committee required by regulation I/7, paragraph 2, the Secretary-General shall:

- .1 solicit and take into account the views expressed by competent persons selected from the list established pursuant to paragraph 5;
- .2 seek clarification when necessary from the Party of any matter related to the information provided under regulation I/7, paragraph 1; and
- .3 identify any area in which the Party may have requested assistance to implement the Convention.

10 The Party concerned shall be informed of the arrangements for the meetings of competent persons, and its representatives shall be entitled to be present to clarify any matter related to the information provided pursuant to regulation I/7, paragraph 1.

11 If the Secretary-General is not in a position to submit the report called for by paragraph 2 of regulation I/7, the Party concerned may request the Maritime Safety Committee to take the action contemplated by paragraph 3 of regulation I/7, taking into account the information submitted pursuant to this section and the views expressed in accordance with paragraphs 7 and 8.

Section A-I/8

Quality standards

National objectives and quality standards

1 Each Party shall ensure that the education and training objectives and related standards of competence to be achieved are clearly defined and identify the levels of knowledge, understanding and skills appropriate to the examinations and assessments required under the Convention. The objectives and related quality standards may be specified separately for different courses and training programmes and shall cover the administration of the certification system.

2 The field of application of the quality standards shall cover the administration of the certification system, all training courses and programmes, examinations and assessments carried out by or under the authority of a Party and the qualifications and experience required of instructors and assessors, having regard to the policies, systems, controls and internal quality assurance reviews established to ensure achievement of the defined objectives.

3 Each Party shall ensure that an independent evaluation of the knowledge, understanding, skills and competence acquisition and assessment activities, and of the administration of the certification system, are conducted at intervals of not more than five years in order to verify that:

- .1 all internal management control and monitoring measures and follow-up actions comply with planned arrangements and documented procedures and are effective in ensuring achievement of the defined objectives;

- .2 the results of each independent evaluation are documented and brought to the attention of those responsible for the area evaluated; and
- .3 timely action is taken to correct deficiencies.

4 The report of the independent evaluation required by paragraph 3 of regulation I/8 shall include the terms of reference for the evaluation and the qualifications and experience of the evaluators.

Section A-I/9

Medical standards - Issue and registration of certificates

(No provisions)

Section A-I/10

Recognition of certificates

1 The provisions of regulation I/10, paragraph 4 regarding the non-recognition of certificates issued by a non-Party shall not be construed as preventing a Party, when issuing its own certificate, from accepting seagoing service, education and training acquired under the authority of a non-Party, provided the Party complies with regulation I/9 in issuing each such certificate, and ensures that the requirements of the Convention relating to seagoing service, education, training and competence are complied with.

2 Where an Administration which has recognized a certificate withdraws its endorsement of recognition for disciplinary reasons, the Administration shall inform the Party that issued the certificate of the circumstances.

Section A-I/11

Revalidation of certificates

Professional competence

- 1 Continued professional competence as required under regulation I/11, shall be established by:
 - .1 approved seagoing service performing functions appropriate to the certificate held for a period of at least one year in total during the preceding five years; or
 - .2 having performed functions considered to be equivalent to the seagoing service required in paragraph 1.1; or
 - .3 one of the following:
 - .3.1 passing an approved test, or
 - .3.2 successfully completing an approved course or courses, or

- .3.3 having completed approved seagoing service performing functions appropriate to the certificate held for a period of not less than three months in a supernumerary capacity, or in a lower officer rank than that for which the certificate held is valid immediately prior to taking up the rank for which it is valid.

2 The refresher and updating courses required by regulation I/11 shall be approved and include changes in relevant national and international regulations concerning the safety of life at sea and the protection of the marine environment and take account of any updating of the standard of competence concerned.

Section A-I/12

Standards governing the use of simulators

PART 1 - PERFORMANCE STANDARDS

General performance standards for simulators used in training

- 1 Each Party shall ensure that any simulator used for mandatory simulator-based training shall:
- .1 be suitable for the selected objectives and training tasks;
 - .2 be capable of simulating the operating capabilities of shipboard equipment concerned, to a level of physical realism appropriate to training objectives, and include the capabilities, limitations and possible errors of such equipment;
 - .3 have sufficient behavioural realism to allow a trainee to acquire the skills appropriate to the training objectives;
 - .4 provide a controlled operating environment, capable of producing a variety of conditions, which may include emergency, hazardous or unusual situations relevant to the training objectives;
 - .5 provide an interface through which a trainee can interact with the equipment, the simulated environment and, as appropriate, the instructor; and
 - .6 permit an instructor to control, monitor and record exercises for the effective debriefing of trainees.

General performance standards for simulators used in assessment of competence

- 2 Each Party shall ensure that any simulator used for the assessment of competence required under the Convention or for any demonstration of continued proficiency so required, shall:
- .1 be capable of satisfying the specified assessment objectives;

- .2 be capable of simulating the operational capabilities of the shipboard equipment concerned to a level of physical realism appropriate to the assessment objectives, and include the capabilities, limitations and possible errors of such equipment;
- .3 have sufficient behavioural realism to allow a candidate to exhibit the skills appropriate to the assessment objectives;
- .4 provide an interface through which a candidate can interact with the equipment and simulated environment;
- .5 provide a controlled operating environment, capable of producing a variety of conditions, which may include emergency, hazardous or unusual situations relevant to assessment objectives; and
- .6 permit an assessor to control, monitor and record exercises for the effective assessment of the performance of candidates.

Additional performance standards

3 In addition to meeting the basic requirements set out in paragraphs 1 and 2, simulation equipment to which this section applies shall meet the performance standards given hereunder in accordance with their specific type.

Radar simulation

4 Radar simulation equipment shall be capable of simulating the operational capabilities of navigational radar equipment which meets all applicable performance standards adopted by the Organization* and incorporate facilities to:

- .1 operate in both sea and ground stabilized relative motion and true motion modes;
- .2 model weather, tidal streams, current, shadow sectors, spurious echoes and other propagation effects, and generate coastlines, navigational buoys and search and rescue transponders; and
- .3 create a real-time operating environment incorporating at least two own ship stations with ability to change own ship's course and speed, and include parameters for at least 20 target ships and appropriate communication facilities.

*See resolutions A.222(VII) - Performance standards for navigational radar equipment, A.278(VIII) - Supplement to the recommendation on performance standards for navigational radar equipment and resolution A.477(XII) - Performance standards for radar equipment.

Automatic Radar Plotting Aid (ARPA) simulation

5 ARPA simulation equipment shall be capable of simulating the operational capabilities of ARPAs which meet all applicable performance standards adopted by the Organization*, and shall incorporate the facilities for:

- .1 manual and automatic target acquisition;
- .2 past track information;
- .3 use of exclusion areas;
- .4 vector/graphic time-scale and data display; and
- .5 trial manoeuvres.

PART 2 - OTHER PROVISIONS

Simulator training objectives

6 Each Party shall ensure that the aims and objectives of simulator-based training are defined within an overall training programme and that specific training objectives and tasks are selected so as to relate as closely as possible to shipboard tasks and practices.

Training procedures

- 7 In conducting mandatory simulator-based training, instructors shall ensure that:
- .1 trainees are adequately briefed beforehand on the exercise objectives and tasks and are given sufficient planning time before the exercise starts;
 - .2 trainees have adequate familiarization time on the simulator and with its equipment before any training or assessment exercise commences;
 - .3 guidance given and exercise stimuli are appropriate to the selected exercise objectives and tasks and to the level of trainee experience;
 - .4 exercises are effectively monitored, supported as appropriate by audio and visual observation of trainee activity and pre and post exercise evaluation reports;
 - .5 trainees are effectively debriefed to ensure that training objectives have been met and that operational skills demonstrated are of an acceptable standard;
 - .6 the use of peer assessment during debriefing is encouraged; and

*See resolution A.422(XI) - Performance standards for automatic radar plotting aids.

- .7 simulator exercises are designed and tested so as to ensure their suitability for the specified training objectives.

Assessment procedures

8 Where simulators are used to assess the ability of candidates to demonstrate levels of competency, assessors shall ensure that:

- .1 performance criteria are identified clearly and explicitly and are valid and available to the candidates;
- .2 assessment criteria are established clearly and are explicit to ensure reliability and uniformity of assessment and to optimise objective measurement and evaluation, so that subjective judgements are kept to the minimum;
- .3 candidates are briefed clearly on the tasks and/or skills to be assessed and on the tasks and performance criteria by which their competency will be determined;
- .4 assessment of performance takes into account normal operating procedures and any behavioural interaction with other candidates on the simulator or simulator staff;
- .5 scoring or grading methods to assess performance are used with caution until they have been validated; and
- .6 the prime criterion is that a candidate demonstrates the ability to carry out a task safely and effectively to the satisfaction of the assessor.

Qualifications of instructors and assessors^{*}

9 Each Party shall ensure that instructors and assessors are appropriately qualified and experienced for the particular types and levels of training and corresponding assessment of competence as specified in regulation I/6 and section A-I/6.

Section A-I/13

Conduct of trials

(No provisions)

^{*}IMO Model Course 6.09 - Training Course for Instructors, Volume 1 and
IMO Model Course 3.12 - Examination and Certification of Seafarers may be of assistance in
the preparation of courses.

Section A-I/14

Responsibilities of companies

1 Companies^{*}, masters and crew members each have responsibility for ensuring that the obligations set out in this section are given full and complete effect and that such other measures as may be necessary are taken to ensure that each crew member can make a knowledgeable and informed contribution to the safe operation of the ship.

2 The company shall provide written instructions to the master of each ship to which the Convention applies, setting forth the policies and the procedures to be followed to ensure that all seafarers who are newly employed on board the ship are given a reasonable opportunity to become familiar with the shipboard equipment, operating procedures and other arrangements needed for the proper performance of their duties, before being assigned to those duties. Such policies and procedures shall include:

- .1 allocation of a reasonable period of time during which each newly employed seafarer will have an opportunity to become acquainted with:
 - .1.1 the specific equipment the seafarer will be using or operating, and
 - .1.2 ship specific watchkeeping, safety, environmental protection and emergency procedures and arrangements the seafarer needs to know to perform the assigned duties properly; and
- .2 designation of a knowledgeable crew member who will be responsible for ensuring that an opportunity is provided to each newly employed seafarer to receive essential information in a language the seafarer understands.

Section A-I/15

Transitional provisions

(No provisions)

^{*}IMO Model Course 5.04 - Human Resources Management, and
IMO Model Course 6.03 - Aspects of Ship Administration for Company Office Staff may be of assistance in the preparation of courses

CHAPTER II

STANDARDS REGARDING THE MASTER AND DECK DEPARTMENT

Section A-II/1

Mandatory minimum requirements for certification of officers in charge of a navigational watch on ships of 500 gross tonnage or more

Standard of competence

- 1 Every candidate for certification shall:
 - .1 be required to demonstrate the competence to undertake at operational level, the tasks, duties and responsibilities listed in column 1 of table A-II/1;
 - .2 at least hold an appropriate certificate for performing VHF radiocommunications in accordance with the requirements of the Radio Regulations; and
 - .3 if designated to have primary responsibility for radiocommunications during distress incidents, hold an appropriate certificate issued or recognized under the provisions of the Radio Regulations.
- 2 The minimum knowledge, understanding and proficiency required for certification is listed in column 2 of table A-II/1.
- 3 The level of knowledge of the subjects listed in column 2 of table A-II/1 shall be sufficient for officers of the watch to carry out their watchkeeping duties*.
- 4 Training and experience to achieve the necessary level of theoretical knowledge, understanding and proficiency shall be based on section A-VIII/1, part 3-1 - Basic principles to be observed in keeping a navigational watch and shall also take into account the relevant requirements of this part and the guidance given in part B of this Code.
- 5 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-II/1.

On-board training

- 6 Every candidate for certification as officer in charge of a navigational watch of ships of 500 gross tonnage or more whose seagoing service, in accordance with paragraph 2.2 of regulation II/1, forms part

*IMO Model Course 7.03 - Officer in Charge of a Navigational Watch may be of assistance in the preparation of courses.

of a training programme approved as meeting the requirements of this section shall follow an approved programme of on-board training which:

- .1 ensures that during the required period of seagoing service the candidate receives systematic practical training and experience in the tasks, duties and responsibilities of an officer in charge of a navigational watch, taking into account the guidance given in section B-II/1 of this Code;
- .2 is closely supervised and monitored by qualified officers aboard the ships in which the approved seagoing service is performed; and
- .3 is adequately documented in a training record book or similar document.*

Near-coastal voyages

7 The following subjects may be omitted from those listed in column 2 of table A-II/1 for issue of restricted certificates for service on near-coastal voyages, bearing in mind the safety of all ships which may be operating in the same waters:

- .1 celestial navigation; and
- .2 those electronic systems of position fixing and navigation that do not cover the waters for which the certificate is to be valid.

*IMO Model Course 7.03 - Officer in Charge of a Navigational Watch - and a similar document produced by the International Shipping Federation may be of assistance in the preparation of training record books.

Table A-II/1
Specification of minimum standard of competence for officers in charge of a
navigational watch on ships of 500 gross tonnage or more

Function: Navigation at the operational level

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Plan and conduct a passage and determine position</p>	<p><i>Celestial Navigation</i> Ability to use celestial bodies to determine the ship's position</p> <p><i>Terrestrial and Coastal Navigation</i> Ability to determine the ship's position by use of:</p> <ul style="list-style-type: none"> .1 landmarks .2 aids to navigation, including lighthouses, beacons and buoys .3 dead reckoning, taking into account winds, tides, currents and estimated speed <p>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</p> <p>NOTE: ECDIS systems are considered to be included under the term "charts"</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training <p>using: chart catalogues, charts, navigational publications, radio navigational warnings, sextant, azimuth mirror, electronic navigation equipment, echo sounding equipment, compass</p>	<p>The information obtained from navigational charts and publications is relevant, interpreted correctly and properly applied. All potential navigational hazards are accurately identified</p> <p>The primary method of fixing the ship's position is the most appropriate to the prevailing circumstances and conditions</p> <p>The position is determined within the limits of acceptable instrument/system errors</p> <p>The reliability of the information obtained from the primary method of position fixing is checked at appropriate intervals</p> <p>Calculations and measurements of navigational information are accurate</p> <p>The charts selected are the largest scale suitable for the area of navigation and charts and publications are corrected in accordance with the latest information available</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Plan and conduct a passage and determine position (continued)	<p><i>Electronic systems of position fixing and navigation</i> Ability to determine the ship's position by use of electronic navigational aids</p> <p><i>Echo sounders</i> Ability to operate the equipment and apply the information correctly</p> <p><i>Compass - magnetic and gyro</i> Knowledge of the principles of magnetic and gyro compasses Ability to determine errors of the magnetic and gyro compasses, using celestial and terrestrial means, and to allow for such errors</p> <p><i>Steering control systems</i> Knowledge of steering control systems, operational procedures and change-over from manual to automatic control and vice-versa. Adjustment of controls for optimum performance</p> <p><i>Meteorology</i> Ability to use and interpret information obtained from shipborne meteorological instruments Knowledge of the characteristics of the various weather systems, reporting procedures and recording systems Ability to apply the meteorological information available</p>		<p>Performance checks and tests to navigation systems comply with manufacturer's recommendations and good navigational practice</p> <p>Errors in magnetic and gyro compasses are determined and correctly applied to courses and bearings</p> <p>The selection of the mode of steering is the most suitable for the prevailing weather, sea and traffic conditions and intended manoeuvres</p> <p>Measurements and observations of weather conditions are accurate and appropriate to the passage</p> <p>Meteorological information is correctly interpreted and applied</p>

Table A-II/1
Page 2 of 11 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Maintain a safe navigational watch</p>	<p><i>Watchkeeping</i> Thorough knowledge of the content, application and intent of the International Regulations for Preventing Collisions at Sea</p> <p>Thorough knowledge of the basic principles to be observed in keeping a navigational watch</p> <p>Thorough knowledge of effective bridge team work procedures</p> <p>The use of routeing in accordance with the General Provisions on Ships' Routeing</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience; .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training 	<p>The conduct, hand over and relief of the watch conforms with accepted principles and procedures</p> <p>A proper lookout is maintained at all times and in such a way as to conform to accepted principles and procedures</p> <p>Lights, shapes and sound signals conform with the requirements contained in the International Regulations for Preventing Collisions at Sea and are correctly recognized</p> <p>The frequency and extent of monitoring of traffic, the ship and the environment conform with accepted principles and procedures</p> <p>A proper record is maintained of the movements and activities relating to the navigation of the ship</p> <p>Responsibility for the safety of navigation is clearly defined at all times, including periods when the master is on the bridge and while under pilotage</p>
<p>Use of radar and ARPA to maintain safety of navigation</p> <p>Note: Training and assessment in the use of ARPA is not required for those who serve exclusively on ships not fitted with ARPA. This limitation shall be reflected in the endorsement issued to the seafarer concerned.</p>	<p><i>Radar Navigation</i> Knowledge of the fundamentals of radar and automatic radar plotting aids (ARPA) Ability to operate and to interpret and analyse information obtained from radar, including the following:</p>	<p>Assessment of evidence obtained from approved radar simulator and ARPA simulator training plus in-service experience</p>	<p>Information obtained from radar and ARPA is correctly interpreted and analysed taking into account the limitations of the equipment and prevailing circumstances and conditions</p>

Table A-II/1
Page 3 of 11 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Use of radar and ARPA to maintain safety of navigation (continued)</p> <p>Note: Training and assessment in the use of ARPA is not required for those who serve exclusively on ships not fitted with ARPA. This limitation shall be reflected in the endorsement issued to the seafarer concerned.</p>	<p>Performance including:</p> <ul style="list-style-type: none"> .1 factors affecting performance and accuracy .2 setting up and maintaining displays .3 detection and misrepresentation of information, false echoes, sea return, etc., racons and SARTs <p>Use including:</p> <ul style="list-style-type: none"> .1 range and bearing; course and speed of other ships; time and distance of closest approach of crossing, meeting overtaking ships .2 identification of critical echoes; detecting course and speed changes of other ships; effect of changes in own ship's course or speed or both 		<p>Action taken to avoid a close encounter or collision with other vessels is in accordance with the International Regulations for Preventing Collisions at Sea</p> <p>Decisions to amend course and/or speed are both timely and in accordance with accepted navigation practice</p> <p>Adjustments made to the ship's course and speed maintain safety of navigation</p> <p>Communication is clear, concise and acknowledged at all times in a seamanlike manner</p> <p>Manoeuvring signals are made at the appropriate time and are in accordance with the International Regulations for Preventing Collisions at Sea</p>

Table A-II/1
Page 4 of 11 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Use of radar and ARPA to maintain safety of navigation (continued)</p> <p>Note: Training and assessment in the use of ARPA is not required for those who serve exclusively on ships not fitted with ARPA. This limitation shall be reflected in the endorsement issued to the seafarer concerned.</p>	<p>.3 application of the International Regulations for Preventing Collisions at Sea</p> <p>.4 plotting techniques and relative and true motion concepts</p> <p>.5 parallel indexing</p> <p>Principal types of ARPA, their display characteristics, performance standards and the dangers of over reliance on ARPA</p> <p>Ability to operate and to interpret and analyse information obtained from ARPA, including:</p> <p>.1 system performance and accuracy, tracking capabilities and limitations, and processing delays</p> <p>.2 use of operational warnings and system tests</p> <p>.3 methods of target acquisition and their limitations</p> <p>.4 true and relative vectors, graphic representation of target information and danger areas</p> <p>.5 deriving and analysing information, critical echoes, exclusion areas and trial manoeuvres</p>		

Table A-II/1
Page 5 of 11 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Respond to emergencies	<p><i>Emergency procedures</i></p> <p>Precautions for the protection and safety of passengers in emergency situations</p> <p>Initial action to be taken following a collision or a grounding; initial damage assessment and control</p> <p>Appreciation of the procedures to be followed for rescuing persons from the sea, assisting a ship in distress, responding to emergencies which arise in port</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 practical training</p>	<p>The type and scale of the emergency is promptly identified</p> <p>Initial actions and, if appropriate, manoeuvring of the ship are in accordance with contingency plans and are appropriate to the urgency of the situation and nature of the emergency</p>
Respond to a distress signal at sea	<p><i>Search and rescue</i></p> <p>Knowledge of the contents of the IMO Merchant Ship Search and Rescue Manual (MERSAR)</p>	<p>Examination and assessment of evidence obtained from practical instruction or approved simulator training, where appropriate</p>	<p>The distress or emergency signal is immediately recognized</p> <p>Contingency plans and instructions in standing orders are implemented and complied with</p>

Table A-II/1
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Use the Standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communication Phrases and use English in written and oral form</p>	<p><i>English language</i></p> <p>Adequate knowledge of the English language to enable the officer to use charts and other nautical publications, to understand meteorological information and messages concerning ship's safety and operation, to communicate with other ships and coast stations and to perform the officer's duties also with a multi-lingual crew, including the ability to use and understand the Standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communication Phrases</p>	<p>Examination and assessment of evidence obtained from practical instruction</p>	<p>English language navigational publications and messages relevant to the safety of the ship are correctly interpreted or drafted</p> <p>Communications are clear and understood</p>
<p>Transmit and receive information by visual signalling</p>	<p><i>Visual signalling</i></p> <p>Ability to transmit and receive signals by Morse light</p> <p>Ability to use the International Code of Signals</p>	<p>Assessment of evidence obtained from practical instruction</p>	<p>Communications within the operator's area of responsibility are consistently successful</p>

Table A-II/1
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Manoeuvre the ship	<p><i>Ship manoeuvring and handling</i></p> <p>Knowledge of:</p> <ul style="list-style-type: none"> .1 the effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances .2 the effects of wind and current on ship handling .3 manoeuvres and procedures for the rescue of person overboard .4 squat, shallow water and similar effects .5 proper procedures for anchoring and mooring 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved training on a manned scale ship model where appropriate 	<p>Safe operating limits of ship propulsion, steering and power systems are not exceeded in normal manoeuvres</p> <p>Adjustments made to the ship's course and speed maintain safety of navigation</p>

Function: Cargo handling and stowage at the operational level

Monitor the loading, stowage, securing and unloading of cargoes and their care during the voyage	<p><i>Cargo handling and stowage</i></p> <p>Cargo handling, stowage and securing</p> <p>Knowledge of the effect of cargo including heavy lifts on the seaworthiness and stability of the ship</p> <p>Knowledge of safe handling, stowage and securing of cargoes including dangerous, hazardous and harmful cargoes and their effect on the safety of life and of the ship</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate 	<p>Cargo operations are carried out in accordance with the cargo plan or other documents and established safety rules/regulations, equipment operating instructions and shipboard stowage limitations</p> <p>The handling of dangerous, hazardous and harmful cargoes complies with international regulations and recognized standards and codes of safe practice</p>
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Function: Controlling the operation of the ship and care for persons on board at the operational level

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Ensure compliance with pollution prevention requirements</p>	<p><i>Prevention of pollution of the marine environment and anti-pollution procedures</i></p> <p>Knowledge of the precautions to be taken to prevent pollution of the marine environment</p> <p>Anti-pollution procedures and all associated equipment</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p>	<p>Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed</p>
<p>Maintain seaworthiness of the ship</p>	<p><i>Ship stability</i></p> <p>Working knowledge and application of stability, trim and stress tables, diagrams and stress calculating equipment</p> <p>Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy</p> <p>Understanding of the fundamentals of watertight integrity</p> <p><i>Ship construction</i></p> <p>General knowledge of the principal structural members of a ship and the proper names for the various parts</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>The stability conditions comply with the IMO intact stability criteria under all conditions of loading</p> <p>Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice</p>

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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Prevent, control and fight fires on board	<p><i>Fire prevention and fire-fighting appliances</i></p> <p>Knowledge of fire prevention</p> <p>Ability to organize fire drills</p> <p>Knowledge of classes and chemistry of fire</p> <p>Knowledge of fire-fighting systems</p> <p>Knowledge of action to be taken in the event of fire, including fires involving oil systems</p>	Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3	<p>The type and scale of the problem is promptly identified and initial actions conform with the emergency procedure and contingency plans for the ship</p> <p>Evacuation, emergency shut-down and isolation procedures are appropriate to the nature of the emergency and are implemented promptly</p> <p>The order of priority, and the levels and timescales of making reports and informing personnel on board, are relevant to the nature of the emergency and reflect the urgency of the problem</p>
Operate life-saving appliances	<p><i>Life-saving</i></p> <p>Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids.</p> <p>Knowledge of survival at sea techniques</p>	Assessment of evidence obtained from approved training and experience as set out in section A-VI/2, paragraphs 1 to 4	Actions in responding to abandon ship and survival situations are appropriate to the prevailing circumstances and conditions and comply with accepted safety practices and standards

Table A-II/1
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Apply medical first aid on board ship	<p><i>Medical aid</i></p> <p>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</p>	Assessment of evidence obtained from approved training as set out in section A-VI/4, paragraphs 1 to 3	The identification of probable cause, nature and extent of injuries or conditions is prompt and treatment minimizes immediate threat to life
Monitor compliance with legislative requirements	Basic working knowledge of the relevant IMO Conventions concerning safety of life at sea and protection of the marine environment	Assessment of evidence obtained from examination or approved training	Legislative requirements relating to safety of life at sea and protection of the marine environment are correctly identified

Table A-II/1
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Section A-II/2

Mandatory minimum requirements for certification of masters and chief mates on ships of 500 gross tonnage or more

Standard of competence

1 Every candidate for certification as master or chief mate of ships of 500 gross tonnage or more shall be required to demonstrate the competence to undertake at the management level, the tasks, duties and responsibilities listed in column 1 of table A-II/2.

2 The minimum knowledge, understanding and proficiency required for certification is listed in column 2 of table A-II/2. This incorporates, expands and extends in depth the subjects listed in column 2 of table A-II/1 for officers in charge of a navigational watch.

3 Bearing in mind that the master has ultimate responsibility for the safety of the ship, its passengers, crew and cargo, and for the protection of the marine environment against pollution by the ship and that a chief mate shall be in a position to assume that responsibility at any time, assessment in these subjects shall be designed to test their ability to assimilate all available information that affects the safety of the ship, its passengers, crew or cargo, or the protection of the marine environment.

4 The level of knowledge of the subjects listed in column 2 of table A-II/2 shall be sufficient to enable the candidate to serve in the capacity of master or chief mate*.

5 The level of theoretical knowledge, understanding and proficiency required under the different sections in column 2 of table A-II/2 may be varied according to whether the certificate is to be valid for ships of 3,000 gross tonnage or more or for ships of between 500 gross tonnage and 3,000 gross tonnage.

6 Training and experience to achieve the necessary level of theoretical knowledge, understanding and proficiency shall take into account the relevant requirements of this part and the guidance given in part B of this Code.

7 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence in accordance with the methods for demonstrating competence and criteria for evaluating competence tabulated in columns 3 and 4 of table A-II/2.

Near-coastal voyages

8 An Administration may issue a certificate restricted to service on ships engaged exclusively on near-coastal voyages and, for the issue of such a certificate, may exclude such subjects as are 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.

*IMO Model Course 7.01 - Master and Chief Mate may be of assistance in the preparation of courses.

Table A-II/2

Specification of minimum standard of competence for masters and chief mates
on ships of 500 gross tonnage or more

Function: Navigation at the management level

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Plan a voyage and conduct navigation	<p>Voyage planning and navigation for all conditions by acceptable methods of plotting ocean tracks taking into account, e.g.:</p> <ul style="list-style-type: none"> .1 restricted waters .2 meteorological conditions .3 ice .4 restricted visibility .5 traffic separation schemes .6 areas of extensive tidal effects <p>Routeing in accordance with the General Principles on Ships' Routeing</p> <p>Reporting in accordance with the Guidelines and Criteria for Ship Reporting Systems</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved simulator training, where appropriate .3 approved laboratory equipment training <p>using: chart catalogues, charts, nautical publications and ship particulars.</p>	<p>The equipment, charts and nautical publications required for the voyage are enumerated and appropriate to the safe conduct of the voyage.</p> <p>The reasons for the planned route are supported by facts and statistical data obtained from relevant sources and publications.</p> <p>Positions, courses, distances and time calculations are correct within accepted accuracy standards for navigational equipment.</p> <p>All potential navigational hazards are accurately identified.</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Determine position and the accuracy of resultant position fix by any means</p>	<p><i>Position determination in all conditions:</i></p> <p>.1 by celestial observations</p> <p>.2 by terrestrial observations, including the ability to use appropriate charts, notices to mariners and other publications to assess the accuracy of the resulting position fix</p> <p>.3 using modern electronic navigational aids, 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</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved simulator training, where appropriate</p> <p>.3 approved laboratory equipment training</p> <p>using:</p> <p>.1 charts, nautical almanac, plotting sheets, chronometer, sextant and a calculator</p> <p>.2 charts, navigational publications and instruments (azimuth mirror, sextant, log, sounding equipment, compass) and manufacturers' manuals</p> <p>.3 radar, Decca, Loran, satellite navigation systems and appropriate navigational charts and publications.</p>	<p>The primary method chosen for fixing the ship's position is the most appropriate to the prevailing circumstances and conditions</p> <p>The fix obtained by celestial observations is within accepted accuracy levels</p> <p>The fix obtained by terrestrial observations is within accepted accuracy levels</p> <p>The accuracy of the resulting fix is properly assessed</p> <p>The fix obtained by the use of electronic navigational aids is within the accuracy standards of the systems in use. The possible errors affecting the accuracy of the resulting position are stated and methods of minimizing the effects of system errors on the resulting position are properly applied</p>

Table A-II/2
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Determine and allow for compass errors	<p>Ability to determine and allow for errors of the magnetic and gyro-compasses</p> <p>Knowledge of the principles of magnetic and gyro-compasses</p> <p>An understanding of systems under the control of the master gyro and a knowledge of the operation and care of the main types of gyro-compass</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved simulator training, where appropriate</p> <p>.3 approved laboratory equipment training</p> <p>using:</p> <p>celestial observations, terrestrial bearings and comparison between magnetic and gyro-compasses</p>	<p>The method and frequency of checks for errors of magnetic and gyro-compasses ensures accuracy of information</p>

Table A-II/2
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Co-ordinate search and rescue operations	A thorough knowledge of and ability to apply the procedures contained in the IMO Merchant Ship Search and Rescue Manual (MERSAR)	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved simulator training, where appropriate .3 approved laboratory equipment training <p>using:</p> <p>relevant publications, charts, meteorological data, particulars of ships involved, radiocommunication equipment and other available facilities and one or more of the following:</p> <ul style="list-style-type: none"> .1 approved SAR training course .2 approved simulator training, where appropriate .3 approved laboratory equipment training 	<p>The plan for co-ordinating search and rescue operations is in accordance with international guidelines and standards</p> <p>Radiocommunications are established and correct communication procedures are followed at all stages of the search and rescue operations</p>

Table A-II/2
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Establish watchkeeping arrangements and procedures	<p>Thorough knowledge of content, application and intent of the International Regulations for Preventing Collisions at Sea</p> <p>Thorough knowledge of the content, application and intent of the Basic Principles to be Observed in Keeping a Navigational Watch. Effective bridge teamwork procedures</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved simulator training, where appropriate</p>	<p>Watchkeeping arrangements and procedures are established and maintained in compliance with international regulations and guidelines so as to ensure the safety of navigation, protection of the marine environment and safety of the ship and persons on board.</p>

Table A-II/2
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Maintain safe navigation through the use of radar and ARPA and modern navigation systems to assist command decision-making</p> <p>Note: Training and assessment in the use of ARPA is not required for those who serve exclusively on ships not fitted with ARPA. This limitation shall be reflected in the endorsement issued to the seafarer concerned.</p>	<p>An appreciation of system errors and thorough understanding of the operational aspects of modern navigational systems, including radar and ARPA</p> <p>Blind pilotage techniques</p> <p>Evaluation of navigational information derived from all sources, including radar and ARPA, in order to make and implement command decisions for collision avoidance and for directing the safe navigation of the ship</p> <p>The inter-relationship and optimum use of all navigational data available for conducting navigation.</p>	<p>Assessment of evidence obtained from approved radar simulator and ARPA simulator training</p>	<p>Information obtained from radar and ARPA is correctly interpreted and analysed taking into account the limitations of the equipment and prevailing circumstances and conditions.</p> <p>Action taken to avoid a close encounter or collision with another vessel is in accordance with the International Regulations for Preventing Collisions at Sea</p>

Table A-II/2
Page 6 of 17 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Forecast weather and oceanographic conditions	<p>Ability to understand and interpret a synoptic chart and to forecast area weather, taking into account local weather conditions and information received by weather fax</p> <p>Knowledge of the characteristics of various weather systems, including tropical revolving storms and avoidance of storm centres and the dangerous quadrants</p> <p>Knowledge of ocean current systems</p> <p>Ability to calculate tidal conditions</p> <p>Use all appropriate navigational publications on tides and currents</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved laboratory equipment training</p>	<p>The likely weather conditions predicted for a determined period are based on all available information</p> <p>Actions taken to maintain safety of navigation minimize any risk to safety of the ship</p> <p>Reasons for intended action are backed by statistical data and observations of the actual weather conditions</p>

Table A-II/2
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Respond to navigational emergencies	<p>Precautions when beaching a ship</p> <p>Action to be taken if grounding is imminent, and after grounding</p> <p>Refloating a grounded ship with and without assistance</p> <p>Action to be taken if collision is imminent and following a collision or impairment of the watertight integrity of the hull by any cause</p> <p>Assessment of damage control</p> <p>Emergency steering</p> <p>Emergency towing arrangements and towing procedures</p>	Examination and assessment of evidence obtained from practical instruction, in-service experience and practical drills in emergency procedures	<p>The type and scale of any problem is promptly identified and decisions and actions minimize the effects of any malfunction of the ship's systems</p> <p>Communications are effective and comply with established procedures</p> <p>Decisions and actions maximize safety of persons on board</p>

Table A-II/2
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Manoeuvre and handle a ship in all conditions</p>	<p>Manoeuvring and handling a ship in all conditions, including:</p> <ul style="list-style-type: none"> .1 manoeuvres when approaching pilot stations and embarking or disembarking pilots with due regard to weather, tide, headreach and stopping distances .2 handling ship in rivers, estuaries and restricted waters, having regard to the effects of current, wind and restricted water on helm response .3 application of constant rate of turn techniques .4 manoeuvring in shallow water, including the reduction in under-keel clearance caused by squat, rolling and pitching .5 interaction between passing ships and between own ship and nearby banks (canal effect) .6 berthing and unberthing under various conditions of wind, tide and current with and without tugs .7 ship and tug interaction .8 use of propulsion and manoeuvring systems 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved simulator training, where appropriate .3 approved manned scale ship model, where appropriate 	<p>All decisions concerning berthing and anchoring are based on a proper assessment of the ship's manoeuvring and engine characteristics and the forces to be expected while berthed alongside or lying at anchor</p> <p>While underway, a full assessment is made of possible effects of shallow and restricted waters, ice, banks, tidal conditions, passing ships and own ship's bow and stern wave so that the ship can be safely manoeuvred under various conditions of loading and weather</p>

Table A-II/2
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Manoeuvre and handle a ship in all conditions (continued)	<p>.9 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</p> <p>.10 dragging anchor; clearing fouled anchors</p> <p>.11 dry-docking, both with and without damage</p> <p>.12 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 trough of the sea, lessening drift and use of oil</p> <p>.13 precautions in manoeuvring to launch rescue boats or survival craft in bad weather</p> <p>.14 methods of taking on board survivors from rescue boats and survival craft</p> <p>.15 ability to determine the manoeuvring and propulsion characteristics of common types of ships with special reference to stopping distances and turning circles at various draughts and speeds</p>		

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Manoeuvre and handle a ship in all conditions (continued)	<p>.16 importance of navigating at reduced speed to avoid damage caused by own ship's bow wave and stern wave</p> <p>.17 practical measures to be taken when navigating in or near ice or in conditions of ice accumulation on board</p> <p>.18 use of, and manoeuvring in and near, traffic separation schemes and in vessel traffic service(VTS) areas</p>		
Operate remote controls of propulsion plant and engineering systems and services	<p>Operating principles of marine power plants</p> <p>Ships' auxiliary machinery</p> <p>General knowledge of marine engineering terms</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved simulator training where appropriate</p>	<p>Plant, auxiliary machinery and equipment is operated in accordance with technical specifications and within safe operating limits at all times</p>

Table A-II/2
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Function: Cargo handling and stowage at the management level

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Plan and ensure safe loading, stowage, securing, care during the voyage and unloading of cargoes</p>	<p>Knowledge of and ability to apply relevant international regulations, codes and standards concerning the safe handling, stowage, securing and transport of cargoes</p> <p>Knowledge of the effect on trim and stability of cargoes and cargo operations</p> <p>Use of stability and trim diagrams and stress calculating equipment, including automatic data-based (ADB) equipment and knowledge of loading cargoes and ballasting in order to keep hull stress within acceptable limits</p> <p>Stowage and securing of cargoes on board ships, including cargo handling gear and securing and lashing equipment</p> <p>Loading and unloading operations, with special regard to the transport of cargoes identified in the Code of Safe Practice for Cargo Stowage and Securing</p> <p>General knowledge of tankers and tanker operations</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved simulator training, where appropriate</p> <p>using: stability, trim and stress tables, diagrams and stress calculating equipment.</p>	<p>The frequency and extent of cargo condition monitoring is appropriate to its nature and prevailing conditions.</p> <p>Unacceptable or unforeseen variations in the condition or specification of the cargo is promptly recognized and remedial action is immediately taken and designed to safeguard the safety of the ship and those on board.</p> <p>Cargo operations are planned and executed in accordance with established procedures and legislative requirements</p> <p>Stowage and securing of cargoes ensures that stability and stress conditions remain within safe limits at all times during the voyage</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Carriage of dangerous cargoes	<p>International regulations, standards, codes and recommendations on the carriage of dangerous cargoes, including the International Maritime Dangerous Goods (IMDG) Code and the Code of Safe Practice for Solid Bulk Cargoes (BC Code)</p> <p>Carriage of dangerous, hazardous and harmful cargoes; precautions during loading and unloading and care during the voyage</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved simulator training where appropriate</p> <p>.3 approved specialist training</p>	<p>Planned distribution of cargo is based on reliable information and is in accordance with established guidelines and legislative requirements</p> <p>Information on dangers, hazards and special requirements is recorded in a format suitable for easy reference in the event of an incident</p>

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Function: Controlling the operation of the ship and care for persons on board at the management level

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Control trim, stability and stress	<p>Understanding of fundamental principles of ship construction and the theories and factors affecting trim and stability and measures necessary to preserve trim and stability</p> <p>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</p> <p>Knowledge of IMO recommendations concerning ship stability</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p>	Stability and stress conditions are maintained within safe limits at all times
Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea and the protection of the marine environment	<p>Knowledge of international maritime law embodied in international agreements and conventions</p> <p>Regard shall be paid especially to the following subjects:</p> <p>.1 certificates and other documents required to be carried on board ships by international conventions, how they may be obtained and their period of validity</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p>	<p>Procedures for monitoring operations and maintenance comply with legislative requirements</p> <p>Potential non-compliance is promptly and fully identified</p> <p>Planned renewal and extension of certificates ensures continued validity of surveyed items and equipment</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea and the protection of the marine environment (continued)</p>	<p>.2 responsibilities under the relevant requirements of the International Convention on Load Lines</p> <p>.3 responsibilities under the relevant requirements of the International Convention for the Safety of Life at Sea</p> <p>.4 responsibilities under the International Convention for the Prevention of Pollution from Ships</p> <p>.5 maritime declarations of health and the requirements of the International Health Regulations</p> <p>.6 responsibilities under international instruments affecting the safety of the ship, passengers, crew and cargo</p> <p>.7 methods and aids to prevent pollution of the marine environment by ships</p> <p>.8 national legislation for implementing international agreements and conventions</p>		

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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Maintain safety and security of the ship's crew and passengers and the operational condition of life-saving, fire-fighting and other safety systems	<p>A thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea)</p> <p>Organization of fire and abandon ship drills</p> <p>Maintenance of operational condition of life-saving, fire-fighting and other safety systems</p> <p>Actions to be taken to protect and safeguard all persons on board in emergencies</p> <p>Actions to limit damage and save the ship following a fire, explosion, collision or grounding</p>	Examination and assessment of evidence obtained from practical instruction and approved in-service training and experience	Procedures for monitoring fire detection and safety systems ensure that all alarms are detected promptly and acted upon in accordance with established emergency procedures
Develop emergency and damage control plans and handle emergency situations	<p>Preparation of contingency plans for response to emergencies</p> <p>Ship construction, including damage control</p> <p>Methods and aids for fire prevention, detection and extinction</p> <p>Functions and use of life-saving appliances</p>	Examination and assessment of evidence obtained from approved in-service training and experience	Emergency procedures are in accordance with the established plans for emergency situations
Organize and manage the crew	<p>A knowledge of personnel management, organization and training on board ship</p> <p>A knowledge of related international maritime conventions and recommendations, and national legislation</p>	Examination and assessment of evidence obtained from approved in-service training and experience	<p>The crew are allocated duties and informed of expected standards of work and behaviour in a manner appropriate to the individuals concerned</p> <p>Training objectives and activities are based on an assessment of current competence and capabilities and operational requirements</p>

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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Organize and manage the provision of medical care on board	<p>A thorough knowledge* of the use and contents of the following publications:</p> <ul style="list-style-type: none"> .1 International Medical Guide for Ships or equivalent national publications .2 Medical section of the International Code of Signals .3 Medical First Aid Guide for Use in Accidents Involving Dangerous Goods 	Examination and assessment of evidence obtained from approved training	Action taken and procedures followed correctly apply and make full use of advice available.

Table A-II/2
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*The IMO/ILO Document for Guidance section on First Aid and Medical Care may be of assistance in the preparation of courses.

Section A-II/3

Mandatory minimum requirements for certification of officers in charge of a navigational watch and of masters on ships of less than 500 gross tonnage, engaged on near-coastal voyages

Officer in charge of a navigational watch

Standard of competence

- 1 Every candidate for certification shall:
 - .1 be required to demonstrate the competence to undertake at operational level, the tasks, duties and responsibilities listed in column 1 of table A-II/3;
 - .2 at least hold an appropriate certificate for performing VHF radiocommunications in accordance with the requirements of the Radio Regulations; and
 - .3 if designated to have primary responsibility for radiocommunications during distress incidents, hold an appropriate certificate issued or recognized under the provisions of the Radio Regulations.
- 2 The minimum knowledge, understanding and proficiency required for certification is listed in column 2 of table A-II/3.
- 3 The level of knowledge of the subjects listed in column 2 of table A-II/3 shall be sufficient to enable the candidate to serve in the capacity of officer in charge of a navigational watch.
- 4 Training and experience to achieve the necessary level of theoretical knowledge, understanding and proficiency shall also be based on section A-VIII/1, part 3-1 - Basic principles to be observed in keeping a navigational watch, and shall take into account the relevant requirements of this part and the guidance given in part B of this Code.
- 5 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-II/3.

Special training

- 6 Every candidate for certification as officer in charge of a navigational watch on ships of less than 500 gross tonnage, engaged on near-coastal voyages, who, in accordance with paragraph 4.2.1 of regulation II/3, is required to have completed special training, shall follow an approved programme of on-board training which:
 - .1 ensures that during the required period of seagoing service the candidate receives systematic practical training and experience in the tasks, duties and responsibilities of an officer in charge of a navigational watch, taking into account the guidance given in section B-II/1 of this Code;

- .2 is closely supervised and monitored by qualified officers on board the ships in which the approved seagoing service is performed; and
- .3 is adequately documented in a training record book or similar document.*

Master

7 Every candidate for certification as master on ships of less than 500 gross tonnage, engaged on near coastal voyages, shall meet the requirements for an officer in charge of a navigational watch set out below and, in addition, shall be required to provide evidence of knowledge and ability to carry out all the duties of such a master.

*IMO Model Course 7.03 - Officer in Charge of a Navigational Watch - and a similar document produced by the International Shipping Federation may be of assistance in the preparation of courses.

Table A-II/3

Specification of minimum standard of competence for officers in charge of a navigational watch and for masters on ships of less than 500 gross tonnage engaged on near-coastal voyages

Function: Navigation at the operational level

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Plan and conduct a coastal passage and determine position	<p><i>Navigation</i> Ability to determine the ship's position by the use of:</p> <ul style="list-style-type: none"> .1 landmarks .2 aids to navigation, including lighthouses, beacons and buoys .3 dead reckoning, taking into account winds, tides, currents and estimated speed 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training <p>using: chart catalogues, charts, navigational publications, radio navigational warnings, sextant, azimuth mirror, electronic navigation equipment, echo sounding equipment, compass</p>	<p>Information obtained from navigational charts and publications is relevant, interpreted correctly and properly applied</p> <p>The primary method of fixing the ship's position is the most appropriate to the prevailing circumstances and conditions</p> <p>The position is determined within the limits of acceptable instrument/system errors</p> <p>The reliability of the information obtained from the primary method of position fixing is checked at appropriate intervals</p> <p>Calculations and measurements of navigational information are accurate</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Plan and conduct a coastal passage and determine position (continued)</p>	<p>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</p> <p>Reporting in accordance with the Guidelines and Criteria for Ship Reporting Systems</p> <p>Note: This item only required for certification as master</p> <p><i>Navigational aids and equipment</i> Ability to operate safely and determine the ship's position by use of all navigational aids and equipment commonly fitted on board the ships concerned</p> <p><i>Compasses</i> Knowledge of the errors and corrections of magnetic compasses</p> <p>Ability to determine errors of the compass using terrestrial means, and to allow for such errors</p>	<p>Assessment of evidence obtained from approved radar navigation and ARPA simulator training</p>	<p>Charts and publications selected are the largest scale on board suitable for the area of navigation and charts are corrected in accordance with the latest information available</p> <p>Performance checks and tests of navigation systems comply with manufacturer's recommendations, good navigational practice and IMO resolutions on performance standards for navigational equipment</p> <p>Interpretation and analysis of information obtained from radar is in accordance with accepted navigational practice and takes account of the limits and accuracy levels of radar.</p> <p>Errors in magnetic compasses are determined and applied correctly to courses and bearings</p>

Table A-II/3
Page 2 of 10 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Plan and conduct a coastal passage and determine position (continued)</p>	<p><i>Automatic pilot</i></p> <p>Knowledge of automatic pilot systems and procedures; change-over from manual to automatic control and vice-versa; adjustment of controls for optimum performance</p> <p><i>Meteorology</i></p> <p>Ability to use and interpret information obtained from shipborne meteorological instruments</p> <p>Knowledge of the characteristics of the various weather systems, reporting procedures and recording systems</p> <p>Ability to apply the meteorological information available</p>		<p>Selection of the mode of steering is the most suitable for prevailing weather, sea and traffic conditions and intended manoeuvres</p> <p>Measurements and observations of weather conditions are accurate and appropriate to the passage</p> <p>Meteorological information is evaluated and applied to maintain the safe passage of the vessel</p>

Table A-II/3
Page 3 of 10 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Maintain a safe navigational watch	<p><i>Watchkeeping</i></p> <p>Thorough knowledge of content, application and intent of the International Regulations for Preventing Collisions at Sea</p> <p>Knowledge of content of the Basic Principles to be Observed in Keeping a Navigational Watch</p> <p>Use of routeing in accordance with the General Provisions on Ships' Routeing</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>The conduct, handover and relief of the watch conforms with accepted principles and procedures</p> <p>A proper lookout is maintained at all times and in conformity with accepted principles and procedures</p> <p>Lights, shapes and sound signals conform with the requirements contained in the International Regulations for Preventing Collisions at Sea and are correctly recognized</p> <p>The frequency and extent of monitoring of traffic, the ship and the environment conforms with accepted principles and procedures</p>

Table A-II/3
Page 4 of 10 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Maintain a safe navigational watch (continued)			<p>Action to avoid close encounters and collision with other vessels is in accordance with the International Regulations for Preventing Collisions at Sea.</p> <p>Decisions to adjust course and/or speed are both timely and in accordance with accepted navigation procedures</p> <p>A proper record is maintained of movements and activities relating to the navigation of the ship</p> <p>Responsibility for safe navigation is clearly defined at all times, including periods when the Master is on the bridge and when under pilotage</p>
Respond to emergencies	<p><i>Emergency procedures</i> including:</p> <p>.1 precautions for the protection and safety of passengers in emergency situations</p> <p>.2 initial assessment of damage and damage control</p> <p>.3 action to be taken following a collision</p> <p>.4 action to be taken following a grounding</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 practical instruction</p>	<p>The type and scale of the emergency is promptly identified</p> <p>Initial actions and, if appropriate, manoeuvring, are in accordance with contingency plans and are appropriate to the urgency of the situation and the nature of the emergency</p>

Table A-II/3
Page 5 of 10 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Respond to emergencies (continued)	<p>In addition, the following material should be included for certification as master:</p> <ul style="list-style-type: none"> .1 emergency steering .2 arrangements for towing and for being taken in tow .3 rescuing persons from the sea .4 assisting a vessel in distress .5 appreciation of the action to be taken when emergencies arise in port 		
Respond to a distress signal at sea	<p><i>Search and rescue</i></p> <p>Knowledge of the contents of the IMO Merchant Ship Search and Rescue Manual (MERSAR)</p>	Examination and assessment of evidence obtained from practical instruction or approved simulator training, where appropriate	<p>The distress or emergency signal is immediately recognized</p> <p>Contingency plans and instructions in standing orders are implemented and complied with</p>

Table A-II/3
Page 6 of 10 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Manoeuvre the ship and operate small ship power plants	<p><i>Ship manoeuvring and handling</i></p> <p>Knowledge of factors affecting safe manoeuvring and handling</p> <p>The operation of small ship power plants and auxiliaries</p> <p>Proper procedures for anchoring and mooring</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p>	<p>Safe operating limits of ship propulsion, steering and power systems are not exceeded in normal manoeuvres</p> <p>Adjustments made to the ship's course and speed maintain safety of navigation</p> <p>Plant, auxiliary machinery and equipment is operated in accordance with technical specifications and within safe operating limits at all times</p>

Function: Cargo handling and stowage at the operational level

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Monitor the loading, stowage, securing and unloading of cargoes and their care during the voyage	<p><i>Cargo handling, stowage and securing</i></p> <p>Knowledge of safe handling, stowage and securing of cargoes including dangerous, hazardous and harmful cargoes and their effect on the safety of life and of the ship</p> <p>Use of the International Maritime Dangerous Goods (IMDG) Code</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p>	<p>Cargo operations are carried out in accordance with the cargo plan or other documents and established safety rules/regulations, equipment operating instructions and shipboard stowage limitations</p> <p>The handling of dangerous, hazardous and harmful cargoes complies with international regulations and recognized standards and codes of safe practice</p>

Function: Controlling the operation of the ship and care for persons on board at the operational level

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Ensure compliance with pollution prevention requirements	<p><i>Prevention of pollution of the marine environment and anti-pollution procedures</i></p> <p>Knowledge of the precautions to be taken to prevent pollution of the marine environment and anti-pollution procedures</p> <p>Anti-pollution procedures and all associated equipment</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p>	<p>Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed</p>
Maintain seaworthiness of the ship	<p><i>Ship stability</i></p> <p>Working knowledge and application of stability, trim and stress tables, and diagrams and stress calculating equipment</p> <p>Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy</p> <p>Understanding of the fundamentals of watertight integrity</p> <p><i>Ship construction</i></p> <p>General knowledge of the principal structural members of a ship and the proper names for the various parts</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>Stability conditions comply with the IMO intact stability criteria under all conditions of loading</p> <p>Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Prevent, control and fight fires on board	<p><i>Fire prevention and fire-fighting appliances</i></p> <p>Knowledge of fire prevention</p> <p>Ability to organize fire drills</p> <p>Knowledge of classes and chemistry of fire</p> <p>Knowledge of fire-fighting systems</p> <p>Understanding of action to be taken in the event of fire, including fires involving oil systems</p>	Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3	<p>The type and scale of the problem is promptly identified and initial actions conform with the emergency procedures and contingency plans for the ship</p> <p>Evacuation, emergency shut down and isolation procedures are appropriate to the nature of the emergency and are implemented promptly.</p> <p>The order of priority, and the levels and time scales of making reports and informing personnel on board, are relevant to the nature of the emergency and reflect the urgency of the problem</p>
Operate life-saving appliances	<p><i>Life-saving</i></p> <p>Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids. Knowledge of survival at sea techniques</p>	Assessment of evidence obtained from approved training and experience as set out in section A-VI/2, paragraphs 1 to 4	Actions in responding to abandon ship, and survival situations are appropriate to the prevailing circumstances and conditions and comply with accepted safety practices and standards

Table A-II/3
Page 9 of 10 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Apply medical first aid on board ship	<p><i>Medical aid</i></p> <p>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</p>	Assessment of evidence obtained from approved training as set out in section A-VI/4, paragraphs 1 to 3	The identification of probable cause, nature and extent of injuries or conditions is prompt and treatment minimizes immediate threat to life
Monitor compliance with legislative requirements	Basic working knowledge of the relevant IMO conventions concerning safety of life at sea and protection of the marine environment	Assessment of evidence obtained from examination or approved training	Legislative requirements relating to safety of life at sea and protection of the marine environment are correctly identified

Table A-II/3
Page 10 of 10 pages

Section A-II/4

Mandatory minimum requirements for ratings forming part of a navigational watch

Standard of competence

- 1 Every rating forming part of a navigational watch on a seagoing ship of 500 gross tonnage or more shall be required to demonstrate the competence to perform the navigation function at the support level, as specified in column 1 of table A-II/4.
- 2 The minimum knowledge, understanding and proficiency required of ratings forming part of a navigational watch on a seagoing ship of 500 gross tonnage or more is listed in column 2 of table A-II/4.
- 3 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence specified in columns 3 and 4 of table A-II/4. The reference to "practical test" in column 3 may include approved shore-based training in which the students undergo practical testing.
- 4 Where there are no tables of competence for the support level in respect to certain functions, it remains the responsibility of the Administration to determine the appropriate training, assessment and certification requirements to be applied to personnel designated to perform those functions at the support level.

Table A-II/4

Specification of minimum standard of competence for ratings forming part of a navigational watch

Function: Navigation at the support level

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Steer the ship and comply with helm orders also in the English language	Use of magnetic and gyro compasses Helm orders Change-over from automatic pilot to hand steering and vice-versa	Assessment of evidence obtained from: .1 practical test, or .2 approved in-service experience or approved training ship experience	A steady course is steered within acceptable limits having regard to the area of navigation and prevailing sea state. Alterations of course are smooth and controlled Communications are clear and concise at all times and orders are acknowledged in a seamanlike manner
Keep a proper look-out by sight and hearing	Responsibilities of a look-out, including reporting the approximate bearing of a sound signal, light or other object in degrees or points	Assesment of evidence obtained from: .1 practical test, or .2 approved in-service experience or approved training ship experience	Sound signals, lights and other objects are promptly detected and their appropriate bearing in degrees or points is reported to the officer of the watch

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Contribute to monitoring and controlling a safe watch</p>	<p>Shipboard terms and definitions</p> <p>Use of appropriate internal communication and alarm systems</p> <p>Ability to understand orders and to communicate with the officer of the watch in matters relevant to watchkeeping duties</p> <p>Procedures for the relief, maintenance and hand-over of a watch</p> <p>Information required to maintain a safe watch</p> <p>Basic environmental protection procedures</p>	<p>Assessment of evidence obtained from approved in-service experience or approved training ship experience</p>	<p>Communications are clear and concise and advice/clarification is sought from the officer on watch where watch information or instructions are not clearly understood</p> <p>Maintenance, hand-over and relief of the watch is in conformity with accepted practices and procedures</p>
<p>Operate emergency equipment and apply emergency procedures</p>	<p>Knowledge of emergency duties and alarm signals</p> <p>Knowledge of pyrotechnic distress signals; satellite EPIRBs and SARTs</p> <p>Avoidance of false distress alerts and action to be taken in event of accidental activation</p>	<p>Assessment of evidence obtained from demonstration and approved in-service experience or approved training ship experience</p>	<p>Initial action on becoming aware of an emergency or abnormal situation is in conformity with established practices and procedures</p> <p>Communications are clear and concise at all times and orders are acknowledged in a seamanlike manner</p> <p>The integrity of emergency and distress alerting systems is maintained at all times</p>

Table A-II/4
Page 2 of 2 pages

CHAPTER III

STANDARDS REGARDING THE ENGINE DEPARTMENT

Section A-III/1

Mandatory minimum requirements for certification of officers in charge of an engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine-room

Training

1 The education and training required by paragraph 2.3 of regulation III/1 shall include training in mechanical and electrical workshop skills relevant to the duties of an engineer officer.

On-board training

2 Every candidate for certification as officer in charge of an engineering watch in a manned engine-room or as designated duty engineer in a periodically unmanned engine-room of ships powered by main propulsion machinery of 750 kW or more shall follow an approved programme of on-board training which:

- .1 ensures that during the required period of seagoing service the candidate receives systematic practical training and experience in the tasks, duties and responsibilities of an officer in charge of an engine-room watch, taking into account the guidance given in section B-III/1 of this Code;
- .2 is closely supervised and monitored by a qualified and certificated engineer officer aboard the ships in which the approved seagoing service is performed; and
- .3 is adequately documented in a training record book.

Standard of Competence

3 Every candidate for certification as officer in charge of an engineering watch in a manned engine-room or as designated duty engineer in a periodically unmanned engine-room on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more shall be required to demonstrate ability to undertake at the operational level, the tasks, duties and responsibilities listed in column 1 of table A-III/1.

4 The minimum knowledge, understanding and proficiency required for certification is listed in column 2 of table A-III/1.

5 The level of knowledge of the material listed in column 2 of table A-III/1 shall be sufficient for engineer officers to carry out their watchkeeping duties*.

*IMO Model Course 7.04 - Engineer Officer in Charge of a Watch may be of assistance in the preparation of courses.

6 Training and experience to achieve the necessary theoretical knowledge, understanding and proficiency shall be based on section A-VIII/1, part 3-2 - Principles to be observed in keeping an engineering watch, and shall take into account the relevant requirements of this part and the guidance given in part B of this Code.

7 Candidates for certification for service in ships in which steam boilers do not form part of their machinery may omit the relevant requirements of table A-III/1. 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 meets the standard of competence in the items omitted from table A-III/1. Any such limitation shall be stated on the certificate and in the endorsement.

8 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-III/1.

Near-coastal voyages

9 The requirements of paragraphs 2.2 and 2.3 of regulation III/1 may be varied 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. Any such limitation shall be stated on the certificate and in the endorsement.

TABLE A-III/1

Specification of minimum standard of competence for officers in charge of an engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine-room

Function: Marine engineering at the operational level

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Use appropriate tools for fabrication and repair operations typically performed on ships	<p>Characteristics and limitations of materials used in construction and repair of ships and equipment</p> <p>Characteristics and limitations of processes used for fabrication and repair</p> <p>Properties and parameters considered in the fabrication and repair of systems and components</p> <p>Application of safe working practices in the workshop environment</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved workshop skills training</p> <p>.2 approved practical experience and tests</p>	<p>Identification of important parameters for fabrication of typical ship related components is appropriate</p> <p>Selection of material is appropriate</p> <p>Fabrication is to designated tolerances</p> <p>Use of equipment and machine tools is appropriate and safe</p>
Use hand tools and measuring equipment for dismantling, maintenance, repair and re-assembly of shipboard plant and equipment	<p>Design characteristics and selection of materials in construction of equipment</p> <p>Interpretation of machinery drawings and handbooks</p> <p>Operational characteristics of equipment and systems</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved workshop skill training</p> <p>.2 approved practical experience and tests</p>	<p>Safety procedures followed are appropriate</p> <p>Selection of tools and spare gear is appropriate</p> <p>Dismantling, inspecting, repairing and reassembling equipment is in accordance with manuals and good practice</p> <p>Re-commissioning and performance testing is in accordance with manuals and good practice</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Use hand tools, electrical and electronic measuring and test equipment for fault finding, maintenance and repair operations</p>	<p>Safety requirements for working on shipboard electrical systems</p> <p>Construction and operational characteristics of shipboard AC and DC electrical systems and equipment</p> <p>Construction and operation of electrical test and measuring equipment</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved workshop skills training</p> <p>.2 approved practical experience and tests</p>	<p>Implementation of safety procedures is satisfactory</p> <p>Selection and use of test equipment is appropriate and interpretation of results is accurate</p> <p>Selection of procedures for the conduct of repair and maintenance is in accordance with manuals and good practice</p> <p>Commissioning and performance testing of equipment and systems brought back into service after repair is in accordance with manuals and good practice</p>

Table A-III/1
Page 2 of 9 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Maintain a safe engineering watch	<p>Thorough knowledge of basic principles to be observed in keeping an engineering watch including:</p> <p>.1 duties associated with taking over and accepting a watch</p> <p>.2 routine duties undertaken during a watch</p> <p>.3 maintenance of the machinery space log book and the significance of the readings taken</p> <p>.4 duties associated with handing over a watch</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>The conduct, handover and relief of the watch conforms with accepted principles and procedures</p> <p>The frequency and extent of monitoring of engineering equipment and systems conforms to manufacturers' recommendations and accepted principles and procedures including basic principles to be observed in keeping an engineering watch</p> <p>A proper record is maintained of the movements and activities relating to the ship's engineering systems</p>

Table A-III/1
Page 3 of 9 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Maintain a safe engineering watch (continued)	<p>Safety and emergency procedures; changeover of remote/automatic to local control of all systems</p> <p>Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil systems</p>		
Use English in written and oral form	Adequate knowledge of the English language to enable the officer to use engineering publications and to perform engineering duties	Examination and assessment of evidence obtained from practical instruction	<p>English language publications relevant to engineering duties are correctly interpreted</p> <p>Communications are clear and understood</p>

Table A-III/1
Page 4 of 9 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Operate main and auxiliary machinery and associated control systems	Main and auxiliary machinery: .1 preparation of main machinery and preparation of auxiliary machinery for operation .2 operation of steam boilers, including combustion systems .3 methods of checking water level in steam boilers and action necessary if water level is abnormal .4 location of common faults in machinery and plant in engine and boiler rooms and action necessary to prevent damage	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations and avoid pollution of the marine environment Deviations from the norm are promptly identified The output of plant and engineering systems consistently meets requirements including bridge orders relating to changes in speed and direction The causes of machinery malfunctions are promptly identified and actions are designed to ensure the overall safety of the ship and the plant having regard to the prevailing circumstances and conditions
Operate pumping systems and associated control systems	Pumping systems: .1 routine pumping operations .2 operation of bilge, ballast and cargo pumping systems	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations and avoid pollution of the marine environment

Table A-III/1
Page 5 of 9 pages

Function: Maintenance and repair at the operational level

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Maintain marine engineering systems including control systems	<p><i>Marine systems</i> Appropriate basic mechanical knowledge and skills</p> <p><i>Safety and emergency procedures:</i> Safe isolation of electrical and all plant and equipment required before personnel are permitted to work on such plant or equipment</p> <p>Undertake maintenance and repair to plant and equipment</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training</p>	<p>Isolation, dismantling and re-assembly of plant and equipment is in accordance with accepted practices and procedures. Action taken leads to the restoration of plant by the method most suitable and appropriate to the prevailing circumstances and conditions</p>

Function: Electrical, electronic and control engineering at the operational level

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Operate alternators, generators and control systems	<p><i>Generating plant:</i> Appropriate basic electrical knowledge and skills</p> <p>Preparing, starting, coupling and changing over alternators or generators</p> <p>Location of common faults and action to prevent damage</p> <p><i>Control systems:</i> Location of common faults and action to prevent damage</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training</p>	<p>Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations</p>

Function: Controlling the operation of the ship and care for persons on board at the operational level

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Ensure compliance with pollution prevention requirements</p>	<p><i>Prevention of pollution of the marine environment</i> Knowledge of the precautions to be taken to prevent pollution of the marine environment</p> <p>Anti-pollution procedures and all associated equipment</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved training ship experience 	<p>Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed</p>
<p>Maintain seaworthiness of the ship</p>	<p><i>Ship stability</i> Working knowledge and application of stability, trim and stress tables, diagrams and stress calculating equipment</p> <p>Understanding of the fundamentals of watertight integrity</p> <p>Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy</p> <p><i>Ship construction</i> General knowledge of the principal structural members of a ship and the proper names for the various parts</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training 	<p>The stability conditions comply with the IMO intact stability criteria under all conditions of loading</p> <p>Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Prevent, control and fight fires on board	<p><i>Fire prevention and fire-fighting appliances</i></p> <p>Knowledge of fire prevention</p> <p>Ability to organize fire drills</p> <p>Knowledge of classes and chemistry of fire</p> <p>Knowledge of fire-fighting systems</p> <p>Action to be taken in the event of fire, including fires involving oil systems</p>	Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3	<p>The type and scale of the problem is promptly identified and initial actions conform with the emergency procedure and contingency plans for the ship</p> <p>Evacuation, emergency shutdown and isolation procedures are appropriate to the nature of the emergency and are implemented promptly</p> <p>The order of priority, and the levels and time scales of making reports and informing personnel on board, are relevant to the nature of the emergency and reflect the urgency of the problem</p>
Operate life-saving appliances	<p><i>Life-saving</i></p> <p>Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment, including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids.</p> <p>Knowledge of survival at sea techniques</p>	Assessment of evidence obtained from approved training and experience as set out in section A-VI/2, paragraphs 1 to 4	Actions in responding to abandon ship and survival situations are appropriate to the prevailing circumstances and conditions and comply with accepted safety practices and standards

Table A-III/1
Page 8 of 9 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Apply medical first aid on board ship	<p><i>Medical aid</i></p> <p>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</p>	Assessment of evidence obtained from approved training as set out in section A-VI/4, paragraphs 1 to 3	Identification of probable cause, nature and extent of injuries or conditions is prompt and treatment minimizes immediate threat to life
Monitor compliance with legislative requirements	Basic working knowledge of the relevant IMO conventions concerning safety of life at sea and protection of the marine environment	Assessment of evidence obtained from examination or approved training	Legislative requirements relating to safety of life at sea and protection of the marine environment are correctly identified

Table A-III/1
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Section A-III/2

Mandatory minimum requirements for certification of chief engineer officers and second engineer officers on ships powered by main propulsion machinery of 3,000 kW propulsion power or more.

Standard of Competence

1 Every candidate for certification as chief engineer officer and second engineer officer of seagoing ships powered by main propulsion machinery of 3,000 kW power or more shall be required to demonstrate ability to undertake at the management level, the tasks, duties and responsibilities listed in column 1 of table A-III/2.

2 The minimum knowledge, understanding and proficiency required for certification is listed in column 2 of table A-III/2. This incorporates, expands and extends in depth the subjects listed in column 2 of table A-III/1 for officers in charge of an engineering watch.

3 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, assessment 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 and the protection of the marine environment.

4 The level of knowledge of the subjects listed in column 2 of table A-III/2 shall be sufficient to enable the candidate to serve in the capacity of chief engineer officer or second engineer officer*.

5 Training and experience to achieve the necessary level of theoretical knowledge, understanding and proficiency shall take into account the relevant requirements of this part and the guidance given in part B of this Code.

6 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 knowledge requirements. Any such limitation shall be stated on the certificate and in the endorsement.

7 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-III/2.

Near-coastal voyages

8 The level of knowledge, understanding and proficiency required under the different sections listed in column 2 of table A-III/2 may be varied for officers of ships with limited propulsion power engaged on near-coastal voyages, as considered necessary, bearing in mind the effect on the safety of all ships which may be operating in the same waters. Any such limitation shall be stated on the certificate and in the endorsement.

*IMO Model Course 7.02 - Chief and Second Engineer Officer (Motor Ships) may be of assistance in the preparation of courses.

Table A-III/2

Specification of minimum standard of competence for chief engineer officers and second engineer officers on ships powered by main propulsion machinery of 3,000 kW propulsion power or more

Function: Marine engineering at the management level

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Plan and schedule operations	<p><i>Theoretical knowledge</i> Thermodynamics and heat transmission Mechanics and hydromechanics</p> <p>Operating principles of ship power installations (diesel, steam and gas turbine) and refrigeration</p> <p>Physical and chemical properties of fuels and lubricants</p> <p>Technology of materials</p> <p>Naval architecture and ship construction, including damage control</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience; .2 approved training ship experience; .3 approved simulator training, where appropriate</p>	<p>The planning and preparation of operations is suited to the design parameters of the power installation and to the requirements of the voyage</p>
Start up and shut down main propulsion and auxiliary machinery including associated systems	<p>Physical and chemical properties of fuels and lubricants</p> <p>Technology of materials</p> <p>Naval architecture and ship construction, including damage control</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience; .2 approved training ship experience; .3 approved simulator training, where appropriate.</p>	<p>The methods of preparing the start-up and of making available fuels, lubricants, cooling water and air are the most appropriate</p> <p>Checks of pressures, temperatures and revolutions during the start-up and warm-up period are in accordance with technical specifications and agreed work plans</p> <p>Surveillance of main propulsion plant and auxiliary systems is sufficient to maintain safe operating conditions</p> <p>The methods of preparing the shut-down and of supervising the cooling-down of the engine are the most appropriate</p>

Table A-III/2

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Operate, monitor and evaluate engine performance and capacity	<p><i>Practical knowledge</i></p> <p>Operation and maintenance of:</p> <p>.1 marine diesel engines</p> <p>.2 marine steam propulsion plant</p> <p>.3 marine gas turbines</p> <p>Operation and maintenance of auxiliary machinery, including pumping and piping systems, auxiliary boiler plant and steering gear systems</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p>	<p>The methods of measuring the load capacity of the engines are in accordance with technical specifications</p> <p>Performance is checked against bridge orders</p> <p>Performance levels are in accordance with technical specifications</p>
Maintain safety of engine equipment, systems and services	<p>Operation, testing and maintenance of control systems</p> <p>Operation and maintenance of cargo-handling equipment and deck machinery</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p>	<p>Arrangements for ensuring the safe and efficient operation and condition of the machinery installation are suitable for all modes of operation</p>

Table A-III/2
Page 2 of 8 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Manage fuel and ballast operations	Operation and maintenance of machinery including pumps and piping systems	Examination and assessment of evidence obtained from one or more of the following: <ul style="list-style-type: none"> <li data-bbox="974 448 1447 480">.1 approved in-service experience <li data-bbox="974 520 1447 587">.2 approved training ship experience <li data-bbox="974 627 1447 694">.3 approved simulator training, where appropriate 	Fuel and ballast operations meet operational requirements and are carried out so as to prevent pollution of the marine environment
Use internal communication systems	Operation of all internal communication systems on board	Examination and assessment of evidence obtained from one or more of the following: <ul style="list-style-type: none"> <li data-bbox="974 868 1447 900">.1 approved in-service experience <li data-bbox="974 940 1447 1007">.2 approved training ship experience <li data-bbox="974 1046 1447 1114">.3 approved simulator training, where appropriate <li data-bbox="974 1153 1447 1220">.4 approved laboratory equipment training 	Transmission and reception of messages are consistently successful Communication records are complete, accurate and comply with statutory requirements

Table A-III/2
Page 3 of 8 pages

Function: Electrical, electronic and control engineering at the management level

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Operate electrical and electronic control equipment	<p><i>Theoretical knowledge</i></p> <p>Marine electrotechnology, electronics and electrical equipment</p> <p>Fundamentals of automation, instrumentation and control systems</p> <p><i>Practical knowledge</i></p> <p>Operation, testing and maintenance of electrical and electronic control equipment including fault diagnostics</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>Operation of equipment and system is in accordance with operating manuals</p> <p>Performance levels are in accordance with technical specifications</p>
Test, detect faults and maintain and restore electrical and electronic control equipment to operating condition		<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>Maintenance activities are correctly planned in accordance with technical, legislative, safety and procedural specifications</p> <p>The effect of malfunctions on associated plant and systems is accurately identified, ship's technical drawings are correctly interpreted, measuring and calibrating instruments are correctly used and actions taken are justified</p>

Table A-III/2
Page 4 of 8 pages

Function: Maintenance and repair at the management level

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Organize safe maintenance and repair procedures	<p><i>Theoretical knowledge</i></p> <p>Marine engineering practice</p> <p><i>Practical knowledge</i></p> <p>Organizing and carrying out safe maintenance and repair procedures</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved workshop training</p>	<p>Maintenance activities are correctly planned and carried out in accordance with technical, legislative, safety and procedural specifications</p> <p>Appropriate plans, specifications, materials and equipment are available for maintenance and repair</p> <p>Action taken leads to the restoration of plant by the most suitable method</p>
Detect and identify the cause of machinery malfunctions and correct faults	<p><i>Practical knowledge</i></p> <p>Detection of machinery malfunction, location of faults and action to prevent damage</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p>	<p>The methods of comparing actual operating conditions are in accordance with recommended practices and procedures</p> <p>Actions and decisions are in accordance with recommended operating specifications and limitations</p>
Ensure safe working practices	<p><i>Practical knowledge</i></p> <p>Safe working practices</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p>	<p>Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns</p>

Table A-III/2
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Function: Controlling the operation of the ship and care for persons on board at the management level

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Control trim, stability and stress	<p>Understanding of fundamental principles of ship construction and the theories and factors affecting trim and stability and measures necessary to preserve trim and stability</p> <p>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</p> <p>Knowledge of IMO recommendations concerning ship stability</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p>	Stability and stress conditions are maintained within safety limits at all times
Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea and protection of the marine environment	<p>Knowledge of relevant international maritime law embodied in international agreements and conventions</p> <p>Regard shall be paid especially to the following subjects:</p> <p>.1 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</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p>	<p>Procedures for monitoring operations and maintenance comply with legislative requirements</p> <p>Potential non-compliance is promptly and fully identified</p> <p>Requirements for renewal and extension of certificates ensure continued validity of survey items and equipment</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea and the protection of the marine environment (continued)</p>	<p>.2 responsibilities under the relevant requirements of the International Convention on Load Lines</p> <p>.3 responsibilities under the relevant requirements of the International Convention for the Safety of Life at Sea</p> <p>.4 responsibilities under the International Convention for the Prevention of Pollution from Ships</p> <p>.5 maritime declarations of health and the requirements of the International Health Regulations</p> <p>.6 responsibilities under international instruments affecting the safety of the ships, passengers, crew or cargo</p> <p>.7 methods and aids to prevent pollution of the environment by ships</p> <p>.8 knowledge of national legislation for implementing international agreements and conventions</p>		

Table A-III/2
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Maintain safety and security of the vessel, crew and passengers and the operational condition of life-saving, fire-fighting and other safety systems</p>	<p>A thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea)</p> <p>Organization of fire and abandon ship drills</p> <p>Maintenance of operational condition of life-saving, fire-fighting and other safety systems</p> <p>Actions to be taken to protect and safeguard all persons on board in emergencies</p> <p>Actions to limit damage and save the ship following fire, explosion, collision or grounding</p>	<p>Examination and assessment of evidence obtained from practical instruction and approved in-service training and experience</p>	<p>Procedures for monitoring fire detection and safety systems ensure that all alarms are detected promptly and acted upon in accordance with established emergency procedures</p>
<p>Develop emergency and damage control plans and handle emergency situations</p>	<p>Ship construction, including damage control</p> <p>Methods and aids for fire prevention, detection and extinction</p> <p>Functions and use of life-saving appliances</p>	<p>Examination and assessment of evidence obtained from approved in-service training and experience</p>	<p>Emergency procedures are in accordance with the established plans for emergency situations</p>
<p>Organize and manage the crew</p>	<p>A knowledge of personnel management, organization and training on board ships</p> <p>A knowledge of international maritime conventions and recommendations, and related national legislation</p>	<p>Examination and assessment of evidence obtained from approved in-service training and experience</p>	<p>The crew are allocated duties and informed of expected standards of work and behaviour in a manner appropriate to the individuals concerned</p> <p>Training objectives and activities are based on an assessment of current competence and capabilities and operational requirements</p>

Table A-III/2
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Section A-III/3

Mandatory minimum requirements for certification of chief engineer officers and second engineer officers on ships powered by main propulsion machinery of between 750 kW and 3,000 kW propulsion power.

Standard of competence

1 Every candidate for certification as chief engineer officer and second engineer officer of seagoing ships powered by main propulsion machinery of between 750 kW and 3,000 kW power shall be required to demonstrate ability to undertake at management level, the tasks, duties and responsibilities listed in column 1 of table A-III/2.

2 The minimum knowledge, understanding and proficiency required for certification is listed in column 2 of table A-III/2. This incorporates, expands and extends in depth the subjects listed in column 2 of table A-III/1 for officers in charge of an engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine-room.

3 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, assessment 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 and the protection of the marine environment.

4 The level of knowledge of the subjects listed in column 2 of table A-III/2 may be lowered but shall be sufficient to enable the candidate to serve in the capacity of chief engineer officer or second engineer officer at the range of propulsion power specified in this section.

5 Training and experience to achieve the necessary level of theoretical knowledge, understanding and proficiency shall take into account the relevant requirements of this part and the guidance given in part B of this Code.

6 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. Any such limitation shall be stated on the certificate and in the endorsement.

7 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-III/2.

Near-coastal voyages

8 The level of knowledge, understanding and proficiency required under the different sections listed in column 2 of table A-III/2 and the requirements of paragraphs 2.1.1 and 2.1.2 of regulation III/3 may be varied for officers of ships engaged on near-coastal voyages, as considered necessary, bearing in mind the effect on the safety of all ships which may be operating in the same waters. Any such limitation shall be stated on the certificate and in the endorsement.

Section A-III/4

Mandatory minimum requirements for certification of ratings forming part of a watch in a manned engine-room or designated to perform duties in a periodically unmanned engine-room

Standard of competence

- 1 Every rating forming part of an engine-room watch on a seagoing ship shall be required to demonstrate the competence to perform the marine engineering function at the support level, as specified in column 1 of table A-III/4.
- 2 The minimum knowledge, understanding and proficiency required of ratings forming part of an engine-room watch is listed in column 2 of table A-III/4.
- 3 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence specified in columns 3 and 4 of table A-III/4. The reference to "practical test" in column 3 may include approved shore-based training in which the students undergo practical testing.
- 4 Where there are no tables of competence for the support level in respect to certain functions, it remains the responsibility of the Administration to determine the appropriate training, assessment and certification requirements to be applied to personnel designated to perform those functions at the support level.

Table A-III/4

Specification of minimum standard of competence for ratings forming part of an engineering watch

Function: Marine engineering at the support level

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch</p> <p>Understand orders and be understood in matters relevant to watchkeeping duties</p>	<p>Terms used in machinery spaces and names of machinery and equipment</p> <p>Engine-room watchkeeping procedures</p> <p>Safe working practices as related to engine-room operations</p> <p>Basic environmental protection procedures</p> <p>Use of appropriate internal communication system</p> <p>Engine-room alarm systems and ability to distinguish between the various alarms, with special reference to fire-extinguishing gas alarms</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience; or</p> <p>.2 approved training ship experience</p> <p>.3 practical test</p>	<p>Communications are clear and concise and advice or clarification is sought from the officer of the watch where watch information or instructions are not clearly understood</p> <p>Maintenance, hand-over and relief of the watch is in conformity with accepted principles and procedures</p>
<p>For keeping a boiler watch:</p> <p>Maintain the correct water levels and steam pressures</p>	<p>Safe operation of boilers</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience; or</p> <p>.2 approved training ship experience</p> <p>.3 practical test</p>	<p>Assessment of boiler condition is accurate and based on relevant information available from local and remote indicators and physical inspections</p> <p>The sequence and timing of adjustments maintains safety and optimum efficiency</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Operate emergency equipment and apply emergency procedures	Knowledge of emergency duties Escape routes from machinery spaces Familiarity with the location and use of fire-fighting equipment in the machinery spaces	Assessment of evidence obtained from demonstration and approved in-service experience or approved training ship experience	Initial action on becoming aware of an emergency or abnormal situation conforms with established procedures Communications are clear and concise at all times and orders are acknowledged in a seamanlike manner

Table A-III/4
Page 2 of 2 pages

CHAPTER IV
STANDARDS REGARDING RADIO PERSONNEL

Section A-IV/1

Application

(No provisions)

Section A-IV/2

Mandatory minimum requirements for certification of GMDSS radio personnel

Standard of competence

1 The minimum knowledge, understanding and proficiency required for certification of GMDSS radio personnel shall be sufficient for radio personnel to carry out their radio duties. The knowledge required for obtaining each type of certificate defined in the Radio Regulations shall be in accordance with those regulations. In addition, every candidate for certification shall be required to demonstrate ability to undertake the tasks, duties and responsibilities listed in column 1 of table A-IV/2.

2 The knowledge, understanding and proficiency for endorsement under the Convention, of certificates issued under the provisions of the Radio Regulations are listed in column 2 of table A-IV/2.

3 The level of knowledge of the subjects listed in column 2 of table A-IV/2 shall be sufficient for the candidate to carry out his duties.*

4 Every candidate shall provide evidence of having achieved the required standard of competence through:

- .1 demonstration of competence to perform the tasks and duties and to assume responsibilities listed in column 1 of table A-IV/2, in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of that table; and
- .2 examination or continuous assessment as part of an approved course of training based on the material set out in column 2 of table A-IV/2.

*The IMO Model Course related to each certificate (being developed) may be of assistance in the preparation of courses.

TABLE A-IV/2

Specification of minimum standard of competence for GMDSS radio operators

Function: Radiocommunications at the operational level

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Transmit and receive information using GMDSS subsystems and equipment and fulfilling the functional requirements of GMDSS	<p><i>In addition to the requirements of the Radio Regulations, a knowledge of:</i></p> <ul style="list-style-type: none"> .1 search and rescue radiocommunications, including procedures in the IMO Merchant Ship Search and Rescue Manual (MERSAR) .2 the means to prevent the transmission of false distress alerts and the procedures to mitigate the effects of such alerts .3 ship reporting systems .4 radio medical services .5 use of the International Code of Signals and the Standard Marine Navigational Vocabulary as replaced by the Standard Marine Communication Phrases .6 the English language both written and spoken for the communication of information relevant to safety of life at sea <p>Note: This requirement may be reduced in the case of the Restricted Radio Operator Certificate</p>	<p>Examination and assessment of evidence obtained from practical demonstration of operational procedures using:</p> <ul style="list-style-type: none"> .1 approved equipment .2 GMDSS communication simulator, where appropriate* .3 radiocommunication laboratory equipment 	<p>Transmission and reception of communications complies with international regulations and procedures and are carried out efficiently and effectively.</p> <p>English language messages relevant to the safety of the ship and persons on board and protection of the marine environment are correctly handled.</p>
Provide radio services in emergencies	<p><i>The provision of radio services in emergencies such as:</i></p> <ul style="list-style-type: none"> .1 abandon ship .2 fire on board ship .3 partial or full breakdown of radio installations <p>Preventive measures for the safety of ship and personnel in connection with hazards related to radio equipment, including electrical and non-ionising radiation hazards</p>	<p>Assessment and practical demonstration of operational procedures using:</p> <ul style="list-style-type: none"> .1 approved equipment .2 GMDSS communication simulator, where appropriate* .3 radiocommunication laboratory equipment 	<p>Response is carried out efficiently and effectively</p>

*See paragraph 40 of section B-I/12 of this Code.

CHAPTER V

STANDARDS REGARDING SPECIAL TRAINING REQUIREMENTS FOR PERSONNEL ON CERTAIN TYPES OF SHIPS

Section A-V/1

Mandatory minimum requirements for the training and qualifications of masters, officers and ratings on tankers

Tanker familiarization course*

1 The tanker familiarization course referred to in paragraph 1.2 of regulation V/1 shall cover at least the syllabus given in paragraphs 2 to 7 below.

Characteristics of cargoes

2 An outline treatment including practical demonstration of the physical properties of oil, chemicals and gases carried in bulk; vapour pressure/temperature relationship; influence of pressure on boiling temperature; explanation of saturated vapour pressure, diffusion, partial pressure, flammability limits, flashpoint and auto-ignition temperature; practical significance of flashpoint and lower flammable limit; simple explanation of types of electrostatic charge generation; chemical symbols and structures; elements of the chemistry of acids and bases and chemical reactions of well-known groupings sufficient to enable proper utilization of codes.

Toxicity

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

Hazards

- 4 An explanation of hazards including:
- .1 explosion and flammability hazards, flammability limits and sources of ignition and explosion;
 - .2 health hazards including the dangers of skin contact, inhalation and ingestion; oxygen deficiency with particular reference to inert gas systems; harmful properties of cargo carried; accidents to personnel and associated first aid do's and don'ts;
 - .3 hazards to the environment, covering: the effect on human and marine life from the release of oil, chemicals or gases; effect of specific gravity and solubility; danger from vapour cloud drift; effect of vapour pressure and atmospheric conditions;

*The following IMO Model Courses may be of assistance in the preparation of courses:

- .1 IMO Model Course 1.01 - Oil Tanker Familiarization
- .2 IMO Model Course 1.03 - Chemical Tanker Familiarization
- .3 IMO Model Course 1.05 - Liquefied Gas Tanker Familiarization

- .4 reactivity hazards; self-reaction; polymerization; effects of temperature; impurities as catalysts; reaction with air, water and other chemicals; and
- .5 corrosion hazards, covering: the dangers to personnel; attacks on constructional materials; effects of concentration and evolution of hydrogen.

Hazard control

5 Inerting, water padding, drying agents and monitoring techniques; anti-static measures; ventilation; segregation; cargo inhibition and the importance of compatibility of materials.

Safety equipment and protection of personnel

6 The function and calibration of measuring instruments and similar equipment; specialized fire-extinguishing appliances; breathing apparatus and tanker evacuating equipment; safe use of protective clothing and equipment; use of resuscitators and other rescue and escape equipment.

Pollution prevention

7 Procedures to be followed to prevent air and water pollution and measures to be taken in the event of spillage, including the need to:

- .1 immediately report all relevant information to the appropriate officials when a spill is detected or when a malfunction has occurred which poses a risk of a spill;
- .2 promptly notify shore-based response personnel; and
- .3 properly implement shipboard spill containment procedures.

OIL TANKER TRAINING PROGRAMME

8 The specialized training programme referred to in paragraph 2.2 of regulation V/1 appropriate to duties on oil tankers shall provide theoretical and practical knowledge of the subjects specified in paragraphs 9 to 14 below*.

*IMO Model Course 1.02 - Advanced Training Programme on Oil Tanker Operations may be of assistance in the preparation of courses.

Regulations and codes of practice

9 Familiarization with the appropriate provisions of relevant international conventions; relevant international and national codes; the IMO Manual on Oil Pollution; relevant tanker safety guides* and relevant port regulations as commonly applied.

Design and equipment of oil tankers

10 Familiarization with piping, pumping, tank and deck arrangements; types of cargo pumps and their application to various types of cargo; tank cleaning, gas-freeing and inerting systems; cargo tank venting and accommodation ventilation; gauging systems and alarms; cargo heating systems; and the safety aspects of electrical systems.

Cargo characteristics

11 Knowledge of the chemical and physical properties of different oil cargoes.

Ship operations

12 Cargo calculations; loading and discharging plans; loading and discharge procedures including ship-to-ship transfers; checklists; 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 pump-rooms 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.

Repair and maintenance

13 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.

Emergency operations

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- * The latest editions of the following non-IMO documents may be of assistance in the preparation of courses:
- .1 Safety in Oil Tankers (International Chamber of Shipping, Carthusian Court, 12 Carthusian Street, London EC1M 6EB)
 - .2 ICS/OCIMF/IAPH, International Safety Guide for Oil Tankers and Terminals, (Witherby and Co. Ltd., 32/36 Aylesbury Street, London EC1R OET, U.K.) (ISBN 0-948691-62-X)
 - .3 International Chamber of Shipping/Oil Companies International Marine Forum, Ship to Ship Transfer Guide (Petroleum). (Witherby & Co. Ltd., London.) (ISBN 0-948691-49-2)
 - .4 International Chamber of Shipping/Oil Companies International Marine Forum, Clean Seas Guide for Oil Tankers (Retention of oil residues on board), (Witherby & Co. Ltd., London) (ISBN 0-948691-15-8)
 - .5 ICS Guide to Helicopter/Ship Operations

14 The importance of developing ship emergency plans; 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 spillage; medical first aid procedures and the use of resuscitation equipment; use of breathing apparatus for safe entry into and rescue from enclosed spaces.

CHEMICAL TANKER TRAINING PROGRAMME

15 The specialized training programme referred to in paragraph 2.2 of regulation V/1 appropriate to duties on chemical tankers shall provide theoretical and practical knowledge of the subjects specified in paragraphs 16 to 21 below.*

Regulations and codes of practice

16 Familiarization with relevant international conventions, and relevant IMO and national codes and with relevant tanker safety guides** and relevant port regulations as commonly applied.

Design and equipment of chemical tankers

17 A brief description of specialized piping, pumping and tank arrangements, overflow control;

* IMO Model Course 1.04 - Advanced Training Programme on Chemical Tanker Operations may be of assistance in the preparation of courses.

** The latest editions of the following non-IMO documents may be of assistance in the preparation of courses:

- .1 ICS, Safety in Chemical Tankers, (International Chamber of Shipping, Carthusian Court, 12 Carthusian Street, London EC1M 6EB)
- .2 ICS, Tanker Safety Guide (Chemicals), (Witherby Marine Publishing, 32/36 Aylesbury Street, London EC1R OET, U.K.) (ISBN 0-948691-50-6)
- .3 ICS/OCIMF/IAPH, International Safety Guide for Oil Tankers and Terminals, (Witherby Marine Publishing, London) (ISBN 0-948691-62-X)
- .4 ICS/OCIMF/IAPH/INTERTANKO/CEFIC/SIGTTO, Ship/Shore Safety Check List Guidelines, (Witherby Marine Publishing, London) (ISBN 0-854930-28-0)
- .5 ICS/OCIMF, Ship to Ship Transfer Guide (Petroleum), (Witherby & Co. Ltd., London.) (ISBN 0-948691-49-2)
- .6 U.S. Coast Guard, CHRIS, Manual III, Hazardous Chemical Data. (Government Printing Office, Washington, D.C.);
- .7 Tank Cleaning Guide, (Rotterdam, B.V. Chemical Laboratory "Dr. A. Verwey")
- .8 Bureau VERITAS, Gas and Chemical Ships' Safety Handbook, (Lloyd's of London Press Ltd. London) (ISBN 1-85044-089-1)
- .9 ICS Guide to Helicopter/Ship Operations

types of cargo pumps and their application to various types of cargo; tank cleaning and gas-freeing systems; cargo tank venting; vapour return systems; accommodation ventilation, airlocks; gauging systems and alarms; tank temperature control systems and alarms; the safety factors of electrical systems.

Cargo characteristics

18 Sufficient knowledge of liquid chemical cargo characteristics to allow proper use of relevant cargo safety guides^{**}.

Ship operations

19 Cargo calculations; loading and discharging plans; loading and discharge procedures; vapour return systems; checklists; use of monitoring equipment; gas-freeing operations and tank cleaning operations including proper use of absorption and wetting agents and detergents; use and maintenance of inert atmospheres; control of entry into pump-rooms and enclosed spaces; use of detecting and safety equipment; disposal of waste and washings.

Repair and maintenance

20 Precautions to be taken before the repair and maintenance of pumping, piping, electrical and control systems.

Emergency operations

21 The importance of developing ship emergency plans; 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 spillage; medical first aid procedures and the use of resuscitation and decontamination equipment; use of breathing apparatus and escape equipment; safe entry into and rescue from enclosed spaces.

LIQUEFIED GAS TANKER TRAINING PROGRAMME

22 The specialized training programme referred to in paragraph 2.2 of regulation V/1 appropriate to the duties on liquefied gas tankers shall provide theoretical and practical knowledge of the subjects specified in paragraphs 23 to 34 below.*

Regulations and codes of practice

23 Familiarization with relevant international conventions and relevant IMO, national and industry codes.**

24 Familiarization with the ship design and equipment of liquefied gas tankers; types of liquefied gas

* IMO Model Course 1.06 - Advanced Training Programme on Liquefied Gas Tanker Operations may be of assistance in the preparation of courses.

** The latest editions of the following non-IMO documents may be of assistance in the preparation of courses:

- .1 SIGTTO, Liquefied Gas Handling Principles on Ships and in Terminals (Witherby Marine Publishing, 32/36 Aylesbury Street, London EC1R 0ET, U.K.) (ISBN 0-900886-93-5)
- .2 International Chamber of Shipping, Tanker Safety Guide (Liquefied Gas) (Witherby & Co. Ltd., London,) (ISBN 0-906270-01-4)
- .3 ICS/OCIMF, Ship to Ship Transfer Guide (Liquefied Gases) (Witherby & Co. Ltd., London) (ISBN 0-900886-51-X)
- .4 ICS Guide to Helicopter/Ship Operations.

tankers; cargo containment systems (construction, surveys); cargo-handling equipment (pumps, piping systems); cargo conditioning systems (warm-up, cool-down); tank atmosphere control systems (inert gas, nitrogen); instrumentation of cargo containment and handling systems; fire-fighting system and safety and rescue equipment.

Fire-fighting

25 Advanced practical fire-fighting techniques and tactics applicable to gas tankers, including the use of water-spray systems.

Chemistry and physics

26 An introduction to basic chemistry and physics as it relates to the safe carriage of liquefied gases in bulk in ships covering:

- .1 the properties and characteristics of liquefied gases and their vapours, including the definition of gas; simple gas laws; the gas equation; density of gases; diffusion and mixing of gases; compression of gases; liquefaction of gases; refrigeration of gases; critical temperature; the practical significance of flashpoint; upper and lower explosive limits; auto-ignition temperature; compatibility of gases; reactivity; polymerization and inhibitors.
- .2 the properties of single liquids including densities of liquids and vapours; variation with temperature; vapour pressure and temperature; enthalpy; vaporization and boiling liquids; and
- .3 the nature and properties of solutions including the solubility of gases in liquids; miscibility between liquids and effects of temperature change; densities of solutions and dependence on temperature and concentration; effects of dissolved substances on melting and boiling points; hydrates, their formation and dispersion; hygroscopicity; drying of air and other gases; dew point and low temperature effects.

Health hazards

27 Familiarization with health hazards relevant to the carriage of liquefied gas covering:

- .1 toxicity including the modes by which liquefied gases and their vapours may be toxic; the toxic properties of inhibitors and of products of combustion of both materials of construction and of liquefied gases carried; acute and chronic effects of toxicity, systemic poisons and irritants; and the Threshold Limiting Value (TLV);
- .2 hazards of skin contact, inhalation and ingestion; and
- .3 medical first aid and administering of antidotes.

Cargo containment

28 Principles of containment systems; rules; surveys; tank construction, materials, coatings, insulation and compatibility.

Pollution

29 Hazards to human life and to the marine environment; the effect of specific gravity and solubility; danger from vapour cloud drift and the jettisoning of cryogenic liquids.

Cargo handling systems

30 A description of the main types of pumps and pumping arrangements and vapour return systems, piping systems and valves; an explanation of pressure, vacuum, suction, flow, head; filters and strainers; expansion devices; flame screens; commonly used inert gases; storage, generation and distribution systems; temperature and pressure monitoring systems; cargo vent systems; liquid re-circulation and re-liquefaction systems; cargo gauging, instrumentation systems and alarms; gas detection and monitoring systems; CO₂ monitoring systems; cargo boil-off systems and auxiliary systems.

Ship operating procedures

31 Loading and discharging preparations and procedures; check lists; cargo condition maintenance on passage and in harbour; segregation of cargoes and procedures for cargo transfer; changing cargoes, tank cleaning procedures; cargo sampling; ballasting and de-ballasting; warm up and gas-freeing procedures; and procedures for cool-down of a gas-free system from ambient temperature and the safety precautions involved.

Safety practices and equipment

32 The function, calibration and use of portable measuring instruments; fire-fighting equipment and procedures; breathing apparatus; resuscitators; escape sets; rescue equipment; protective clothing and equipment; entry into enclosed spaces; precautions to be observed before and during repair and maintenance of cargo and control systems; supervision of personnel during potentially hazardous operations; types and principles of certified safe electrical equipment and sources of ignition.

Emergency procedures

33 The importance of developing ship emergency plans; emergency shutdown of cargo operations; emergency cargo valve closing systems; action to be taken in the event of failure of systems or services essential to cargo; and action to be taken following collision or stranding, spillage and envelopment of the ship in toxic or flammable vapour.

General principles of cargo operations

34 Inerting cargo tank and void spaces; tank cool down and loading; operations during loaded and ballasted voyages; discharging and tank stripping and emergency procedures, including pre-planned action in the event of leaks, fire, collision, stranding, emergency cargo discharge and personnel casualty.

Section A-V/2

Mandatory minimum requirements for the training and qualifications of masters, officers, ratings and other personnel on ro-ro passenger ships

Crowd management training

1 The crowd management training required by regulation V/2, paragraph 4 for personnel designated on muster lists to assist passengers in emergency situations shall include, but not necessarily be limited

to:

- .1 awareness of life-saving appliance and control plans including:
 - .1.1 knowledge of muster lists and emergency instructions,
 - .1.2 knowledge of the emergency exits, and
 - .1.3 restrictions on the use of elevators;
- .2 the ability to assist passengers en route to muster and embarkation stations including:
 - .2.1 the ability to give clear reassuring orders,
 - .2.2 the control of passengers in corridors, staircases and passage ways,
 - .2.3 maintaining escape routes clear of obstructions,
 - .2.4 methods available for evacuation of disabled persons and persons needing special assistance, and
 - .2.5 search of accommodation spaces;
- .3 mustering procedures including:
 - .3.1 the importance of keeping order,
 - .3.2 the ability to use procedures for reducing and avoiding panic,
 - .3.3 the ability to use, where appropriate, passenger lists for evacuation counts, and
 - .3.4 the ability to ensure that the passengers are suitably clothed and have donned their lifejackets correctly.

Familiarization training

2 The familiarization training required by regulation V/2, paragraph 5 shall at least ensure attainment of the abilities that are appropriate to the capacity to be filled and the duties and responsibilities to be taken up, as follows:

Design and operational limitations

- .1 Ability to properly understand and observe any operational limitations imposed on the ship, and to understand and apply performance restrictions, including speed limitations in adverse weather, which are intended to maintain the safety of life, ship and cargo.

Procedures for opening, closing and securing hull openings

- .2 Ability to apply properly the procedures established for the ship regarding the opening, closing and securing of bow, stern, and side doors and ramps and to correctly operate the related systems.

Legislation, codes and agreements affecting ro-ro passenger ships

- .3 Ability to understand and apply international and national requirements for ro-ro passenger ships relevant to the ship concerned and the duties to be performed.

Stability and stress requirements and limitations

- .4 Ability to take proper account of stress limitations for sensitive parts of the ship such as bow doors and other closing devices that maintain watertight integrity and of special stability considerations which may affect the safety of ro-ro passenger ships.

Procedures for the maintenance of special equipment on ro-ro passenger ships

- .5 Ability to apply properly the shipboard procedures for maintenance of equipment peculiar to ro-ro passenger ships such as, bow, stern and side doors and ramps, scuppers and associated systems.

Loading and cargo securing manuals and calculators

- .6 Ability to make proper use of the loading and securing manuals in respect of all types of vehicles and rail cars where applicable, and to calculate and apply stress limitations for vehicle decks.

Dangerous cargo areas

- .7 Ability to ensure proper observance of special precautions and limitations applying to designated dangerous cargo areas.

Emergency procedures

- .8 Ability to ensure proper application of any special procedures to:
- .8.1 prevent or reduce the ingress of water on vehicle decks,
 - .8.2 remove water from vehicle decks, and
 - .8.3 minimize effects of water on vehicle decks.

Safety training for personnel providing direct service to passengers in passenger spaces

3 The additional safety training required by regulation V/2, paragraph 6, shall at least ensure attainment of the abilities as follows:

Communication

- .1 Ability to communicate with passengers during an emergency, taking into account:
- .1.1 the language or languages appropriate to the principal nationalities of passengers carried on the particular route,
 - .1.2 the likelihood that an ability to use an elementary English vocabulary for basic instructions can provide a means of communicating with a passenger in need of assistance whether or not the passenger and crew member share a common language,
 - .1.3 the possible need to communicate during an emergency by some other means such as by demonstration, or hand signals, or calling attention to the location of instructions, muster stations, life-saving devices or evacuation routes, when oral communication is impractical,

- .1.4 the extent to which complete safety instructions have been provided to passengers in their native language or languages, and
- .1.5 the languages in which emergency announcements may be broadcast during an emergency or drill to convey critical guidance to passengers and to facilitate crew members in assisting passengers.

Life-saving appliances

- .2 Ability to demonstrate to passengers the use of personal life-saving appliances.

Passenger safety, cargo safety and hull integrity training

4 The passenger safety, cargo safety and hull integrity training required by regulation V/2, paragraph 7, for masters, chief mates, chief engineer officers, second engineer officers and persons assigned immediate responsibility for embarking and disembarking passengers loading, discharging or securing cargo or for closing hull openings, shall at least ensure attainment of the abilities that are appropriate to their duties and responsibilities as follows:

Loading and embarkation procedures

- .1 Ability to apply properly the procedures established for the ship regarding :
 - .1.1 loading and discharging vehicles, rail cars and other cargo transport units, including related communications,
 - .1.2 lowering and hoisting ramps,
 - .1.3 setting up and stowing retractable vehicle decks, and
 - .1.4 embarking and disembarking passengers with special attention to disabled persons and persons needing assistance.

Carriage of dangerous goods

- .2 Ability to apply any special safeguards, procedures and requirements regarding the carriage of dangerous goods on board ro-ro passenger ships.

Securing cargoes

- .3 Ability to:
 - .3.1 apply correctly the provisions of the Code of Safe Practice for Cargo Stowage and Securing to the vehicles, rail cars and other cargo transport units carried; and
 - .3.2 use properly the cargo securing equipment and materials provided, taking into account their limitations.

Stability, trim and stress calculations

- .4 Ability to:
 - .4.1 make proper use of the stability and stress information provided,
 - .4.2 calculate stability and trim for different conditions of loading using the stability calculators or computer programmes provided,
 - .4.3 calculate load factors for decks, and
 - .4.4 calculate the impact of ballast and fuel transfers on stability, trim and stress.

Opening, closing and securing hull openings

- .5 Ability to:
 - .5.1 apply properly the procedures established for the ship regarding the opening, closing and securing of bow, stern and side doors and ramps and to correctly operate the associated systems, and
 - .5.2 conduct surveys on proper sealing.

Ro-ro deck atmosphere

- .6 Ability to:
 - .6.1 use equipment, where carried, to monitor atmosphere in ro-ro cargo spaces, and
 - .6.2 apply properly the procedures established for the ship for ventilation of ro-ro cargo spaces during loading and discharging of vehicles, while on voyage and in emergencies.

Crisis management and human behaviour training

5 The crisis management and human behaviour training required by regulation V/2, paragraph 8, for masters, chief mates, chief engineer officers, second engineer officers and any person having responsibility for the safety of passengers in emergency situations shall be to the satisfaction of the Administration based on standards developed by the Organization.

CHAPTER VI

STANDARDS REGARDING EMERGENCY, OCCUPATIONAL SAFETY, MEDICAL CARE AND SURVIVAL FUNCTIONS

Section A-VI/1

Mandatory minimum requirements for familiarization and basic safety training and instruction for all seafarers

Familiarization training

1 Before being assigned to shipboard duties, all persons employed or engaged on a seagoing ship other than passengers, shall receive approved familiarization training in personal survival techniques or receive sufficient information and instruction, taking account of the guidance given in part B, to be able to:

- .1 communicate with other persons on board on elementary safety matters and understand safety information symbols, signs and alarm signals;
- .2 know what to do if:
 - .2.1 a person falls overboard,
 - .2.2 fire or smoke is detected, or
 - .2.3 the fire or abandon ship alarm is sounded;
- .3 identify muster and embarkation stations and emergency escape routes;
- .4 locate and don life-jackets;
- .5 raise the alarm and have basic knowledge of the use of portable fire extinguishers;
- .6 take immediate action upon encountering an accident or other medical emergency before seeking further medical assistance on board; and
- .7 close and open the fire weathertight and watertight doors fitted in the particular ship other than those for hull openings.

Basic training*

2 Seafarers employed or engaged in any capacity on board ship on the business of that ship as part of the ship's complement with designated safety or pollution prevention duties in the operation of the ship shall, before being assigned to any shipboard duties:

- .1 receive appropriate approved basic training or instruction in:
 - .1.1 personal survival techniques as set out in table A-VI/1-1,
 - .1.2 fire prevention and fire-fighting as set out in table A-VI/1-2,
 - .1.3 elementary first-aid as set out in table A-VI/1-3, and
 - .1.4 personal safety and social responsibilities as set out in table A-VI/1-4.
- .2 be required to provide evidence of having achieved the required standard of competence to undertake the tasks, duties and responsibilities listed in column 1 of tables A-VI/1-1, A-VI/1-2, A-VI/1-3 and A-VI/1-4 within the previous five years through:
 - .2.1 demonstration of competence, in accordance with the methods and the criteria for evaluating competence tabulated in columns 3 and 4 of those tables; and
 - .2.2 examination or continuous assessment as part of an approved training programme in the subjects listed in column 2 of those tables.

3 The Administration may, in respect of ships other than passenger ships of more than 500 gross tonnage engaged on international voyages and tankers, if it considers that a ship's size and the length or character of its voyage are such as to render the application of the full requirements of this section unreasonable or impracticable, exempt to that extent the seafarers on such a ship or class of ships from some of the requirements, bearing in mind the safety of people on board, the ship and property and the protection of the marine environment.

*The following IMO Model Courses may assist in the preparation of courses:

- .1 IMO Model Course 1.19 - Personal Survival
- .2 IMO Model Course 1.20 - Basic Fire-Fighting
- .3 IMO Model Course 1.13 - Medical Emergency - Basic Training
- .4 IMO Model Course 1.19 - Personal Survival
- .5 IMO Model Course 1.21 - Human relationships

Table A-VI/1-1

Specification of minimum standard of competence in personal survival techniques

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Survive at sea in the event of ship abandonment	<p>Types of emergency situations which may occur, such as collision, fire, foundering</p> <p>Types of life-saving appliances normally carried on ships</p> <p>Equipment in survival craft</p> <p>Location of personal life-saving appliances</p> <p>Principles concerning survival including:</p> <p>.1 value of training and drills</p> <p>.2 personal protective clothing and equipment</p> <p>.3 need to be ready for any emergency</p> <p>.4 actions to be taken when called to survival craft stations</p> <p>.5 actions to be taken when required to abandon ship.</p>	<p>Assessment of evidence obtained from approved instruction or during attendance at an approved course or approved in-service experience and examination, including practical demonstration of competence to:</p> <p>.1 don a life-jacket</p> <p>.2 don and use an immersion suit</p> <p>.3 safely jump from a height into the water</p> <p>.4 right an inverted liferaft while wearing a life-jacket</p> <p>.5 swim while wearing a life-jacket</p> <p>.6 keep afloat without a life-jacket</p> <p>.7 board a survival craft from ship and water while wearing a life-jacket</p>	<p>Action taken on identifying muster signals is appropriate to the indicated emergency and complies with established procedures</p> <p>The timing and sequence of individual actions are appropriate to the prevailing circumstance and conditions and minimize potential dangers and threats to survival</p> <p>Method of boarding survival craft is appropriate and avoids dangers to other survivors</p> <p>Initial actions after leaving the ship and procedures and actions in water minimize threats to survival</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Survive at sea in the event of ship abandonment (continued)	<p>6 actions to be taken when in the water</p> <p>.7 actions to be taken when aboard a survival craft</p> <p>.8 main dangers to survivors</p>	<p>.8 take initial actions on boarding survival craft to enhance chance of survival</p> <p>.9 stream a drogue or sea anchor</p> <p>.10 operate survival craft equipment</p> <p>.11 operate location devices, including radio equipment</p>	

Table A-VI/1-1
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Table A-VI/1-2

Specification of minimum standard of competence in fire prevention and fire-fighting

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Minimize the risk of fire and maintain a state of readiness to respond to emergency situations involving fire	<p>Shipboard fire-fighting organization</p> <p>Location of fire-fighting appliances and emergency escape routes</p> <p>The elements of fire and explosion (the fire triangle)</p> <p>Types and sources of ignition</p> <p>Flammable materials, fire hazards and spread of fire</p> <p>The need for constant vigilance</p> <p>Actions to be taken on board ship</p> <p>Fire and smoke detection and automatic alarm systems</p> <p>Classification of fire and applicable extinguishing agents</p>	Assessment of evidence obtained from approved instruction or attendance at an approved course	<p>Initial actions on becoming aware of an emergency conform with accepted practices and procedures</p> <p>Action taken on identifying muster signals is appropriate to the indicated emergency and complies with established procedures</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Fight and extinguish fires	<p>Fire-fighting equipment and its location on-board</p> <p>Instruction in:</p> <ul style="list-style-type: none"> .1 fixed installations .2 firefighter's outfits .3 personal equipment .4 fire-fighting appliances and equipment .5 fire-fighting methods .6 fire-fighting agents .7 fire-fighting procedures .8 use of breathing apparatus for fighting fires and effecting rescues 	<p>Assessment of evidence obtained from approved instruction or during attendance at an approved course including practical demonstration in spaces which provide truly realistic training conditions (e.g. simulated shipboard conditions) and, whenever possible and practical, in darkness, of the ability to:</p> <ul style="list-style-type: none"> .1 use various types of portable fire extinguishers .2 use self-contained breathing apparatus .3 extinguish smaller fires, e.g. electrical fires, oil fires, propane fires .4 extinguish extensive fires with water using jet and spray nozzles .5 extinguish fires with foam, powder or any other suitable chemical agent .6 enter and pass through with lifeline but without breathing apparatus a compartment into which high expansion foam has been injected 	<p>Clothing and equipment are appropriate to the nature of the fire-fighting operations</p> <p>The timing and sequence of individual actions are appropriate to the prevailing circumstances and conditions</p> <p>Extinguishment of fire is achieved using appropriate procedures, techniques and fire-fighting agents</p> <p>Breathing apparatus procedures and techniques comply with accepted practices and procedures</p>

Table A-VI/1-2
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COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Fight and extinguish fires (continued)		<p>.7 fight fire in smoke-filled enclosed spaces wearing self-contained breathing apparatus</p> <p>.8 extinguish fire with water fog, or any other suitable fire-fighting agent in an accommodation room or simulated engine-room with fire and heavy smoke</p> <p>.9 extinguish oil fire with fog applicator and spray nozzles, dry chemical powder or foam applicators</p> <p>.10 effect a rescue in a smoke-filled space wearing breathing apparatus</p>	

Table A-VI/1-2
Page 3 of 3 pages

Table A-VI/1-3

Specification of minimum standard of competence in elementary first aid

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Take immediate action upon encountering an accident or other medical emergency</p>	<p>Assessment of needs of casualties and threats to own safety</p> <p>Appreciation of body structure and functions</p> <p>Understanding of immediate measures to be taken in cases of emergency, including the ability to:</p> <ul style="list-style-type: none"> .1 position casualty .2 apply resuscitation techniques .3 control bleeding .4 apply appropriate measures of basic shock management .5 apply appropriate measures in event of burns and scalds, including accidents caused by electric current .6 rescue and transport a casualty .7 improvise bandages and use materials in emergency kit 	<p>Assessment of evidence obtained from approved instruction or during attendance at an approved course</p>	<p>The manner and timing of raising the alarm is appropriate to the circumstances of the accident or medical emergency</p> <p>The identification of probable cause, nature and extent of injuries is prompt and complete and the priority and sequence of actions is proportional to any potential threat to life</p> <p>Risk of further harm to self and casualty is minimized at all times</p>

Table A-VI/1-4

Specification of minimum standard of competence in personal safety and social responsibilities

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Comply with emergency procedures	Types of emergency which may occur, such as collision, fire, foundering Knowledge of shipboard contingency plans for response to emergencies Emergency signals and specific duties allocated to crew members in the muster list; muster stations; correct use of personal safety equipment Action to take on discovering potential emergency, including fire, collision, foundering and ingress of water into the ship Action to take on hearing emergency alarm signals Value of training and drills Knowledge of escape routes and internal communication and alarm systems	Assessment of evidence obtained from approved instruction or during attendance at an approved course	Initial action on becoming aware of an emergency conforms to established emergency response procedures Information given on raising alarm is prompt, accurate, complete and clear
Take precautions to prevent pollution of the marine environment	Effects of operational or accidental pollution of the marine environment Basic environmental protection procedures	Assessment of evidence obtained from approved instruction or during attendance at an approved course	Organizational procedures designed to safeguard the marine environment are observed at all times

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Observe safe working practices	<p>Importance of adhering to safe working practices at all times</p> <p>Safety and protective devices available to protect against potential hazards aboard ship</p> <p>Precautions to be taken prior to entering enclosed spaces</p> <p>Familiarization with international measures concerning accident prevention and occupational health*</p>	Assessment of evidence obtained from approved instruction or during attendance at an approved course	Safe working practices are observed and appropriate safety and protective equipment is correctly used at all times
Understand orders and be understood in relation to shipboard duties	Ability to understand orders and to communicate with others in relation to shipboard duties	Assessment of evidence obtained from approved instruction or during attendance at an approved course	Communications are clear and effective at all times
Contribute to effective human relationships on board ship	<p>Importance of maintaining good human and working relationships aboard ship</p> <p>Social responsibilities; employment conditions; individual rights and obligations; dangers of drug and alcohol abuse</p>	Assessment of evidence obtained from approved instruction or during attendance at an approved course	Expected standards of work and behaviour are observed at all times

* "The ILO Code of Practice on Accident Prevention on board ship at sea and in port" may be of assistance in the preparation of courses.

Section A-VI/2

Mandatory minimum requirements for the issue of certificates of proficiency in survival craft, rescue boats and fast rescue boats

Proficiency in survival craft and rescue boats other than fast rescue boats

Standard of Competence

1 Every candidate for a certificate of proficiency in survival craft and rescue boats other than fast rescue boats shall be required to demonstrate competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/2-1.

2 The level of knowledge of the subjects listed in column 2 of table A-VI/2-1 shall be sufficient to enable the candidate to launch and take charge of a survival craft or rescue boat in emergency situations* .

3 Training and experience to achieve the necessary level of theoretical knowledge, understanding and proficiency shall take account of the guidance given in part B of this Code.

4 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence within the previous five years through:

- .1 demonstration of competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/2-1, in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of that table; and
- .2 examination or continuous assessment as part of an approved training programme covering the material set out in column 2 of table A-VI/2-1.

Proficiency in fast rescue boats

Standard of competence

5 Every candidate for a certificate of proficiency in fast rescue boats shall be required to demonstrate competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/2-2.

6 The level of knowledge of the subjects listed in column 2 of table A-VI/2-2 shall be sufficient to enable the candidate to launch and take charge of a fast rescue boat in emergency situations.

*IMO Model Course 1.23 - Proficiency in Survival Craft may be of assistance in the preparation of courses.

7 Training and experience to achieve the necessary level of theoretical knowledge, understanding and proficiency shall take account of the guidance given in part B of this Code.

8 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence within the previous five years through:

- .1 demonstration of competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/2-2, in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of that table; and
- .2 examination or continuous assessment as part of an approved training programme covering the material set out in column 2 of table A-VI/2-2.

Table A-VI/2-1

**Specification of the minimum standard of competence in survival craft and rescue boats
other than fast rescue boats**

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Take charge of a survival craft or rescue boat during and after launch	<p>Construction and outfit of survival craft and rescue boats and individual items of their equipment</p> <p>Particular characteristics and facilities of survival craft and rescue boats</p> <p>Various types of device used for launching survival craft and rescue boats</p> <p>Methods of launching survival craft into a rough sea</p> <p>Methods of recovering survival craft</p> <p>Action to be taken after leaving the ship</p> <p>Methods of launching and recovering rescue boats in a rough sea</p>	<p>Assessment of evidence obtained from practical demonstration of ability to:</p> <p>.1 right an inverted liferaft while wearing a life-jacket</p> <p>.2 interpret the markings on survival craft as to the number of persons they are intended to carry</p> <p>.3 give correct commands for launching and boarding survival craft, clearing the ship and handling and disembarking persons from survival craft</p> <p>.4 prepare and safely launch survival craft and clear the ship's side quickly</p> <p>.5 safely recover survival craft and rescue boats</p> <p>Using: inflatable liferaft and open or enclosed lifeboat with inboard engine</p>	<p>Preparation, boarding and launching of survival craft are within equipment limitations and enable survival craft to clear the ship safely</p> <p>Initial actions on leaving the ship minimize threat to survival</p> <p>Recovery of survival craft and rescue boats is within equipment limitations</p>
Operate a survival craft engine	<p>Methods of starting and operating a survival craft engine and its accessories together with the use of the fire extinguisher provided</p>	<p>Assessment of evidence obtained from practical demonstration of ability to start and operate an inboard engine fitted in an open or enclosed lifeboat</p>	<p>Propulsion is available and maintained as required for manoeuvring</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Manage survivors and survival craft after abandoning ship	<p>Handling survival craft in rough weather</p> <p>Use of painter, sea anchor and all other equipment</p> <p>Apportionment of food and water in survival craft</p> <p>Action taken to maximize detectability and location of survival craft</p> <p>Method of helicopter rescue</p> <p>Effects of hypothermia and its prevention; use of protective covers and garments including immersion suits and thermal protective aids</p> <p>Use of rescue boats and motor lifeboats for marshalling liferafts and rescue of survivors and persons in the sea</p> <p>Beaching survival craft</p>	<p>Assessment of evidence obtained from practical demonstration of ability to:</p> <p>.1 row and steer a boat and steer by compass</p> <p>.2 use individual items of equipment of survival craft</p> <p>.3 rig devices to aid location</p>	Survival management is appropriate to prevailing circumstances and conditions
Use locating devices, including communication and signalling apparatus and pyrotechnics	<p>Radio life-saving appliances carried in survival craft, including satellite EPIRBs and SARTs</p> <p>Pyrotechnic distress signals</p>	<p>Assessment of evidence obtained from practical demonstration of ability to:</p> <p>.1 use portable radio equipment for survival craft</p> <p>.2 use signalling equipment, including pyrotechnics</p>	Use and choice of communication and signalling apparatus is appropriate to prevailing circumstances and conditions

Table A-VI/2-1
Page 2 of 3 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Apply first aid to survivors	Use of the first aid kit and resuscitation techniques Management of injured persons, including control of bleeding and shock	Assessment of evidence obtained from practical demonstration of ability to deal with injured persons both during and after abandonment using first aid kit and resuscitation techniques	Identification of the probable cause, nature and extent of injuries or condition is prompt and accurate Priority and sequence of treatment minimizes any threat to life

Table A-VI/2-1
Page 3 of 3 pages

Table A-VI/2-2

Specification of the minimum standard of competence in fast rescue boats

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Take charge of a fast rescue boat during and after launch</p>	<p>Construction and outfit of fast rescue boats and individual items of their equipment</p> <p>Particular characteristics and facilities of fast rescue boats</p> <p>Safety precautions during launch and recovery of a fast rescue boat</p> <p>Procedures for righting a capsized fast rescue boat</p> <p>How to handle a fast rescue boat in prevailing and adverse weather and sea conditions</p> <p>Navigational and safety equipment available in a fast rescue boat</p> <p>Search patterns and environmental factors affecting their execution</p> <p>Assessment of the readiness of fast rescue boats and related equipment for immediate use</p>	<p>Assessment of evidence obtained from practical demonstration of ability to:</p> <p>.1 control safe launching and recovery of a fast rescue boat</p> <p>.2 right a capsized fast rescue boat</p> <p>.3 handle a fast rescue boat in prevailing weather and sea conditions</p> <p>.4 swim in special equipment</p> <p>.5 use communication and signalling equipment between the fast rescue boat and a helicopter and a ship</p> <p>.6 use the emergency equipment carried</p> <p>.7 recover a casualty from the water and transfer a casualty to a rescue helicopter or to a ship or to a place of safety</p>	<p>Preparation, boarding, launching and operation of fast rescue boats is within equipment limitations</p>

Table A-VI/2-2

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	Knowledge of the maintenance, emergency repairs, normal inflation and deflation of buoyancy compartments of inflated fast rescue boats	.8 carry out search patterns taking account of environmental factors	
Operate a fast rescue boat engine	Methods of starting and operating a fast rescue boat engine and its accessories	Assessment of evidence obtained from practical demonstration of ability to start and operate a fast rescue boat engine	Engine is started and operated as required for manoeuvring

Table A-VI/2-2
Page 2 of 2 pages

Section A-VI/3

Mandatory minimum training in advanced fire-fighting

Standard of competence

- 1 Seafarers designated to control fire-fighting operations shall have successfully completed advanced training in techniques for fighting fire, with particular emphasis on organization, tactics and command, and shall be required to demonstrate competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/3.
- 2 The level of knowledge and understanding of the subjects listed in column 2 of table A-VI/3 shall be sufficient for the effective control of fire-fighting operations on board ship.*
- 3 Training and experience to achieve the necessary level of theoretical knowledge, understanding and proficiency shall take account of the guidance given in part B of this Code.
- 4 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence within the previous five years, in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-VI/3.

*IMO Model Course 2.03 - Advanced Training in Fire-Fighting may be of assistance in the preparation of courses.

Table A-VI/3

Specification of minimum standard of competence in advanced fire-fighting

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Control fire-fighting operations aboard ships	<p>Fire-fighting procedures at sea and in port with particular emphasis on organization, tactics and command</p> <p>Use of water for fire-extinguishing, the effect on ship stability, precautions and corrective procedures</p> <p>Communication and co-ordination during fire-fighting operations</p> <p>Ventilation control, including smoke extractor</p> <p>Control of fuel and electrical systems</p> <p>Fire-fighting process hazards (dry distillation, chemical reactions, boiler uptake fires, etc.)</p> <p>Fire-fighting involving dangerous goods</p> <p>Fire precautions and hazards associated with the storage and handling of materials (paints, etc.)</p> <p>Management and control of injured persons</p> <p>Procedures for co-ordination with shore-based fire fighters</p>	<p>Practical exercises and instruction conducted under approved and truly realistic training conditions (e.g.: simulated shipboard conditions) and, whenever possible and practicable, in darkness</p>	<p>Actions taken to control fires are based on a full and accurate assessment of the incident using all available sources of information</p> <p>The order of priority, timing and sequence of actions are appropriate to the overall requirements of the incident and to minimize damage and potential damage to the ship, injuries to personnel and impairment of the operational effectiveness of the ship</p> <p>Transmission of information is prompt, accurate, complete and clear</p> <p>Personal safety during fire control activities is safeguarded at all times</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Organize and train fire parties	Preparation of contingency plans Composition and allocation of personnel to fire parties Strategies and tactics for control of fires in various parts of the ship	Practical exercises and instruction conduct under approved and truly realistic training conditions, e.g. simulated shipboard conditions	Composition and organization of fire control parties ensure the prompt and effective implementation of emergency plans and procedures
Inspect and service fire detection and extinguishing systems and equipment	Fire detection systems; fixed fire-extinguishing systems; portable and mobile fire-extinguishing equipment including appliances, pumps and rescue, salvage, life support, personal protective and communication equipment Requirements for statutory and classification surveys	Practical exercises using approved equipment and systems in a realistic training environment	Operational effectiveness of all fire detection and extinguishing systems and equipment is maintained at all times in accordance with performance specifications and legislative requirements
Investigate and compile reports on incidents involving fire	Assessment of cause of incidents involving fire	Practical exercises in a realistic training environment	Causes of fire are identified and the effectiveness of counter measures are evaluated

Table A-VI/3
Page 2 of 2 pages

Section A-VI/4

Mandatory minimum requirements related to medical first aid and medical care

Standard of competence for seafarers designated to provide medical first aid on board ship

1 Every seafarer who is designated to provide medical first aid on board ship shall be required to demonstrate the competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/4-1.

2 The level of knowledge of the subjects listed in column 2 of table A-VI/4-1 shall be sufficient to enable the designated seafarer to take immediate effective action in the case of accidents or illness likely to occur on board ship.*

3 Every candidate for certification under the provisions of regulation VI/4, paragraph 1 shall be required to provide evidence that the required standard of competence has been achieved in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-VI/4-1.

Standard of competence for seafarers designated to take charge of medical care on board ship

4 Every seafarer who is designated to take charge of medical care on board ship shall be required to demonstrate the competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/4-2.

5 The level of knowledge of the subjects listed in column 2 of table A-VI/4-2 shall be sufficient to enable the designated seafarer to take immediate effective action in the case of accidents or illness likely to occur on board ship.**

6 Every candidate for certification under the provisions of regulation VI/4, paragraph 2 shall be required to provide evidence that the required standard of competence has been achieved in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-VI/4-2.

*IMO Model Course 1.14 - Medical Emergency - First Aid may be of assistance in the preparation of courses.

**IMO Model Course 1.15 - Medical Care may be of assistance in the preparation of courses.

Table A-VI/4-1

Specification of minimum standard of proficiency in medical first aid

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Apply immediate first aid in the event of accident or illness on board	First aid kit Body structure and function Toxicological hazards on board, including use of the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG) or its national equivalent Examination of casualty or patient Spinal injuries Burns, scalds and effects of cold fractures, dislocations and muscular injuries Medical care of rescued persons Radio-medical advice Pharmacology Sterilisation Cardiac arrest, drowning and asphyxia	Assessment of evidence obtained from practical instruction	The identification of probable cause, nature and extent of injuries is prompt, complete and conforms to current first aid practice Risk of harm to self and others is minimized at all times Treatment of injuries and the patients condition is appropriate, conforms to recognized first aid practice and international guidelines

Table A-VI/4-1

Table A-VI/4-2

Specification of minimum standard of proficiency for persons in charge of medical care on board ship

Column 1	Column 2	Column 3	Column 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
<p>Provide medical care to the sick and injured while they remain on board</p>	<p>Care of casualty involving:</p> <ul style="list-style-type: none"> .1 head and spinal injuries .2 injuries of ear, nose, throat and eyes .3 external and internal bleeding .4 burns, scalds and frostbite .5 fractures, dislocations and muscular injuries .6 wounds, wound healing and infection .7 pain relief .8 techniques of sewing and clamping .9 management of acute abdominal conditions .10 minor surgical treatment .11 dressing and bandaging <p>Aspects of nursing:</p> <ul style="list-style-type: none"> .1 general principles .2 nursing care 	<p>Assessment of evidence obtained from practical instruction and demonstration</p> <p>Where practicable, approved practical experience at a hospital or similar establishment</p>	<p>Identification of symptoms is based on the concepts of clinical examination and medical history</p> <p>Protection against infection and spread of diseases is complete and effective</p> <p>Personal attitude is calm, confident and reassuring</p> <p>Treatment of injury or condition is appropriate and conforms to accepted medical practice and relevant national and international medical guides</p> <p>The dosage and application of drugs and medication complies with manufacturers' recommendations and accepted medical practice</p> <p>The significance of changes in patients' condition is promptly recognized</p>

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Provide medical care to the sick and injured while they remain on board (continued)	<p>Diseases, including:</p> <ul style="list-style-type: none"> .1 medical conditions and emergencies .2 sexually transmitted diseases .3 tropical and infectious diseases <p>Alcohol and drug abuse</p> <p>Dental care</p> <p>Gynaecology, pregnancy and childbirth</p> <p>Medical care of rescued persons</p> <p>Death at sea</p> <p>Hygiene</p> <p>Disease prevention including:</p> <ul style="list-style-type: none"> .1 disinfection, disinfestation, deratting .2 vaccinations <p>Keeping records and copies of applicable regulations:</p> <ul style="list-style-type: none"> .1 keeping medical records .2 international and national maritime medical regulations 		

Table A-VI/4-2
Page 2 of 3 pages

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
Participate in co-ordinated schemes for medical assistance to ships	External assistance, including: .1 radio-medical advice .2 transportation of the ill and injured, including helicopter evacuation .3 medical care of sick seafarers involving co-operation with port health authorities or outpatient wards in port		Clinical examination procedures are complete and comply with instructions received The method and preparation for evacuation is in accordance with recognized procedures and is designed to maximize the welfare of the patient Procedures for seeking radio-medical advice conform to established practice and recommendations

Table A-VI/4-2
Page 3 of 3 pages

CHAPTER VII

STANDARDS REGARDING ALTERNATIVE CERTIFICATION

Section A-VII/1

Issue of alternative certificates

1 Every candidate for certification at the operational level under the provisions of chapter VII of the Annex to the Convention shall be required to complete relevant education and training and meet the standard of competence for all the functions prescribed in either table A-II/1 or table A-III/1. Functions specified in tables A-II/1 or A-III/1 respectively may be added provided the candidate completes, as appropriate, additional relevant education and training and meets the standards of competence prescribed in those tables for the functions concerned.

2 Every candidate for certification at the management level as the person having command of a ship of 500 gross tonnage or more, or the person upon whom the command of such a ship will fall in the event of the incapacity of the person in command, shall be required in addition to compliance with the standard of competence specified in table A-II/1 to complete relevant education and training and meet the standards of competence for all of the functions prescribed in table A-II/2. Functions specified in the tables of chapter III of this part may be added provided the candidate completes, as appropriate, additional relevant education and training and meets the standards of competence prescribed in those tables for the functions concerned.

3 Every candidate for certification at the management level as the person responsible for the mechanical propulsion of a ship powered by main propulsion machinery of 750 kW or more, or the person upon whom such responsibility will fall in the event of the incapacity of the person responsible for the mechanical propulsion of the ship, shall be required, in addition to compliance with the standard of competence specified in table A-III/1, to complete relevant education and training and meet the standards of competence for all of the functions prescribed in table A-III/2, as appropriate. Functions specified in the tables of chapter II of this part may be added provided the candidate completes, as appropriate, additional relevant education and training and meets the standards of competence prescribed in those tables for the functions concerned.

4 Every candidate for certification at the support level in navigation or marine engineering shall comply with the standard of competence prescribed in table A-II/4 or A-III/4 of this part, as appropriate.

Section A-VII/2

Certification of seafarers

1 In accordance with the requirements of regulation VII/1, paragraph 1.3, every candidate for certification under the provisions of chapter VII at operational level in functions specified in tables A-II/1 or A-III/1 shall:

- .1 have approved seagoing service of not less than one year, which service shall include a period of at least six months performing engine-room duties under the supervision of a qualified engineer officer and, where the function of navigation is required, a period of at

least six months performing bridge watchkeeping duties under the supervision of a qualified bridge watchkeeping officer; and

- .2 have completed, during this service, on-board training programmes approved as meeting the relevant requirements of sections A-II/1 and A-III/1 and documented in an approved training record book.

2 Every candidate for certification under the provisions of chapter VII at the management level in a combination of functions specified in tables A-II/2 and A-III/2, shall have approved seagoing service related to the functions to be shown in the endorsement to the certificate as follows:

- .1 for persons other than those having command or responsibility for the mechanical propulsion of a ship - 12 months performing duties at the operational level related to regulation III/2 or III/3 as appropriate and, where the function of navigation at the management level is required, at least 12 months performing bridge watchkeeping duties at the operational level;
- .2 for those having command or the responsibility for the mechanical propulsion of a ship - not less than 48 months including the provisions in paragraph 2.1 of this section performing, as a certificated officer, duties related to the functions to be shown in the endorsement to the certificate, of which 24 months shall be served performing functions set out in table A-II/1 and 24 months shall be served performing functions set out in tables A-III/1 and A-III/2.

Section A-VII/3

Principles governing the issue of alternative certificates

(No provisions)

CHAPTER VIII

STANDARDS REGARDING WATCHKEEPING

Section A-VIII/1

Fitness for duty

- 1 All persons who are assigned duty as officer in charge of a watch or as a rating forming part of a watch shall be provided a minimum of 10 hours of rest in any 24-hour period.
- 2 The hours of rest may be divided into no more than two periods, one of which shall be at least 6 hours in length.
- 3 The requirements for rest periods laid down in paragraphs 1 and 2 need not be maintained in the case of an emergency or drill or in other overriding operational conditions.

4 Notwithstanding the provisions of paragraphs 1 and 2, the minimum period of ten hours may be reduced to not less than 6 consecutive hours provided that any such reduction shall not extend beyond two days and not less than 70 hours of rest are provided each seven day period.

5 Administrations shall require that watch schedules be posted where they are easily accessible.

Section A - VIII/2

Watchkeeping arrangements and principles to be observed

PART 1 - CERTIFICATION

1 The officer in charge of the navigational or deck watch shall be duly qualified in accordance with the provisions of chapter II, or chapter VII appropriate to the duties related to navigational or deck watchkeeping.

2 The officer in charge of the engineering watch shall be duly qualified in accordance with the provisions of chapter III, or chapter VII appropriate to the duties related to engineering watchkeeping.

PART 2 - VOYAGE PLANNING

General requirements

3 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.

4 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.

Planning prior to each voyage

5 Prior to each voyage the master of every ship shall ensure that the intended route from the port of departure to the first port of call is planned using adequate and appropriate charts and other nautical publications necessary for the intended voyage, containing accurate, complete and up-to-date information regarding those navigational limitations and hazards which are of a permanent or predictable nature, and which are relevant to the safe navigation of the ship.

Verification and display of planned route

6 When the route planning is verified taking into consideration all pertinent information, the planned route shall be clearly displayed on appropriate charts, and shall be continuously available to the officer in charge of the watch who shall verify each course to be followed prior to using it during the voyage.

Deviation from planned route

7 If a decision is made, during a voyage, to change the next port of call of the planned route, or if it is necessary for the ship to deviate substantially from the planned route for other reasons, then an amended route shall be planned prior to deviating substantially from the route originally planned.

PART 3 - WATCHKEEPING AT SEA

Principles applying to watchkeeping generally

8 Parties shall direct the attention of companies, masters, chief engineer officers and watchkeeping personnel to the following principles which shall be observed to ensure that safe watches are maintained at all times.

9 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 navigational watch are responsible for navigating the ship safely during their periods of duty, when they will be particularly concerned with avoiding collision and stranding.

10 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 engineering watch.

Protection of marine environment

11 The master, officers and 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.

PART 3-1 - PRINCIPLES TO BE OBSERVED IN KEEPING A NAVIGATIONAL WATCH

12 The officer in charge of the navigational watch is the master's representative and is primarily responsible at all times for the safe navigation of the ship and for complying with the International Regulations for Preventing Collisions at Sea, 1972.

Look-out

13 A proper look-out shall be maintained at all times in compliance with rule 5 of the International Regulations for Preventing Collisions at Sea, 1972 and shall serve the purpose of:

- .1 maintaining a continuous state of vigilance by sight and hearing as well as by all other available means, with regard to any significant change in the operating environment;
- .2 fully appraising the situation and the risk of collision, stranding and other dangers to navigation; and
- .3 detecting ships or aircraft in distress, shipwrecked persons, wrecks, debris and other hazards to safe navigation.

14 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.

15 The duties of the look-out and helmsperson are separate and the helmsperson 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 navigational watch may be the sole look-out in daylight provided that on each such occasion:

- .1 the situation has been carefully assessed and it has been established without doubt that it is safe to do so;
- .2 full account has been taken of all relevant factors including, but not limited to:
 - state of weather,
 - visibility,
 - traffic density,
 - proximity of dangers to navigation, and
 - the attention necessary when navigating in or near traffic separation schemes; and
- .3 assistance is immediately available to be summoned to the bridge when any change in the situation so requires.

16 In determining that the composition of the navigational watch is adequate to ensure that a proper look-out can continuously be maintained, the master shall take into account all relevant factors, including those described in this section of the Code, as well as the following factors:

- .1 visibility, state of weather and sea;
- .2 traffic density, and other activities occurring in the area in which the vessel is navigating;
- .3 the attention necessary when navigating in or near traffic separation schemes or other routing measures;
- .4 the additional workload caused by the nature of the ship's functions, immediate operating requirements and anticipated manoeuvres;
- .5 the fitness for duty of any crew members on call who are assigned as members of the watch;
- .6 knowledge of and confidence in the professional competence of the ship's officers and crew;
- .7 the experience of each officer of the navigational watch, and the familiarity of that officer with the ship's equipment, procedures, and manoeuvring capability;
- .8 activities taking place on board the ship at any particular time, including radiocommunication activities and the availability of assistance to be summoned immediately to the bridge when necessary;

- .9 the operational status of bridge instrumentation and controls, including alarm systems;
- .10 rudder and propeller control and ship manoeuvring characteristics;
- .11 the size of the ship and the field of vision available from the conning position;
- .12 the configuration of the bridge, to the extent such configuration might inhibit a member of the watch from detecting by sight or hearing any external development; and
- .13 any other relevant standard, procedure or guidance relating to watchkeeping arrangements and fitness for duty which has been adopted by the Organization.

Watch arrangements

17 When deciding the composition of the watch on the bridge, which may include appropriately qualified ratings, the following factors, *inter alia*, shall be taken into account:

- .1 at no time shall the bridge be left unattended;
- .2 weather conditions, visibility and whether there is daylight or darkness;
- .3 proximity of navigational hazards which may make it necessary for the officer in charge of the watch to carry out additional navigational duties;
- .4 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;
- .5 whether the ship is fitted with automatic steering;
- .6 whether there are radio duties to be performed;
- .7 unmanned machinery space (UMS) controls, alarms and indicators provided on the bridge, procedures for their use and limitations; and
- .8 any unusual demands on the navigational watch that may arise as a result of special operational circumstances.

Taking over the watch

18 The officer in charge of the navigational watch shall not hand over the watch to the relieving officer if there is reason to believe that the latter is not capable of carrying out the watchkeeping duties effectively, in which case the master shall be notified.

19 The relieving officer shall ensure that the members of the relieving watch are fully capable of performing their duties, particularly as regards their adjustment to night vision. Relieving officers shall not take over the watch until their vision is fully adjusted to the light conditions.

20 Prior to taking over the watch relieving officers shall satisfy themselves as to the ship's estimated or true position and confirm its intended track, course and speed, and UMS controls as appropriate and shall note any dangers to navigation expected to be encountered during their watch.

21 Relieving officers shall personally satisfy themselves regarding the:

- .1 standing orders and other special instructions of the master relating to navigation of the ship;
- .2 position, course, speed and draught of the ship;
- .3 prevailing and predicted tides, currents, weather, visibility and the effect of these factors upon course and speed;
- .4 procedures for the use of main engines to manoeuvre when the main engines are on bridge control; and
- .5 navigational situation, including but not limited to:
 - .5.1 the operational condition of all navigational and safety equipment being used or likely to be used during the watch,
 - .5.2 the errors of gyro and magnetic compasses,
 - .5.3 the presence and movement of ships in sight or known to be in the vicinity,
 - .5.4 the conditions and hazards likely to be encountered during the watch, and
 - .5.5 the possible effects of heel, trim, water density and squat on under keel clearance.

22 If at any time the officer in charge of the navigational watch is to be relieved when a manoeuvre or other action to avoid any hazard is taking place, the relief of that officer shall be deferred until such action has been completed.

Performing the navigational watch

23 The officer in charge of the navigational watch shall:

- .1 keep the watch on the bridge;
- .2 in no circumstances leave the bridge until properly relieved;
- .3 continue to be responsible for the safe navigation of the ship, despite the presence of the master on the bridge, until informed specifically that the master has assumed that responsibility and this is mutually understood; and
- .4 notify the master when in any doubt as to what action to take in the interest of safety.

24 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.

25 The officer in charge of the navigational 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.

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

27 Officers of the navigational watch shall make the most effective use of all navigational equipment at their disposal.

28 When using radar, the officer in charge of the navigational watch shall bear in mind the necessity to comply at all times with the provisions on the use of radar contained in the International Regulations for Preventing Collisions at Sea, in force.

29 In cases of need the officer in charge of the navigational watch shall not hesitate to use the helm, engines and sound signalling apparatus. However, timely notice of intended variations of engine speed shall be given where possible or effective use made of UMS engine controls provided on the bridge in accordance with the applicable procedures.

30 Officers of the navigational watch shall know the handling characteristics of their ship, including its stopping distances, and should appreciate that other ships may have different handling characteristics.

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

32 It is of special importance that at all times the officer in charge of the navigational watch ensures that a proper look-out is maintained. In a ship with a separate chart room the officer in charge of the navigational watch may visit the chart room, when essential, for a short period for the necessary performance of navigational duties, but shall first ensure that it is safe to do so and that proper look-out is maintained.

33 Operational tests of shipboard navigational equipment shall be carried out at sea as frequently as practicable and as circumstances permit, in particular before hazardous conditions affecting navigation are expected. Whenever appropriate, these tests shall be recorded. Such tests shall also be carried out prior to port arrival and departure.

34 The officer in charge of the navigational watch shall make regular checks to ensure that:

- .1 the person steering the ship or the automatic pilot is steering the correct course;
- .2 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;
- .3 the automatic pilot is tested manually at least once a watch;

- .4 the navigation and signal lights and other navigational equipment are functioning properly;
- .5 the radio equipment is functioning properly in accordance with paragraph 86 of this section; and
- .6 the UMS controls, alarms and indicators are functioning properly.

35 The officer in charge of the navigational watch shall bear in mind the necessity to comply at all times with the requirements in force of the International Convention for the Safety of Life at Sea, (SOLAS) 1974*. The officer of the navigational watch shall take into account:

- .1 the need to station a person to steer the ship 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; and
- .2 that with a ship under automatic steering it is highly dangerous to allow a situation to develop to the point where the officer in charge of the navigational watch is without assistance and has to break the continuity of the look-out in order to take emergency action.

36 Officers of the navigational watch shall be thoroughly familiar with the use of all electronic navigational aids carried, including their capabilities and limitations, and shall use each of these aids when appropriate and shall bear in mind that the echo-sounder is a valuable navigational aid.

37 The officer in charge of the navigational watch shall use the radar whenever restricted visibility is encountered or expected, and at all times in congested waters having due regard to its limitations.

38 The officer in charge of the navigational watch shall ensure that range scales employed are changed at sufficiently frequent intervals so that echoes are detected as early as possible. It shall be borne in mind that small or poor echoes may escape detection.

39 Whenever radar is in use, the officer in charge of the navigational watch shall select an appropriate range scale and observe the display carefully, and shall ensure that plotting or systematic analysis is commenced in ample time.

40 The officer in charge of the navigational watch shall notify the master immediately:

- .1 if restricted visibility is encountered or expected;
- .2 if the traffic conditions or the movements of other ships are causing concern;
- .3 if difficulty is experienced in maintaining course;
- .4 on failure to sight land, a navigation mark or to obtain soundings by the expected time;
- .5 if, unexpectedly, land or a navigation mark is sighted or a change in soundings occurs;

*See regulations V/19, V/19-1 and V/19-2.

- .6 on breakdown of the engines, propulsion machinery remote control, steering gear or any essential navigational equipment, alarm or indicator;
- .7 if the radio equipment malfunctions;
- .8 in heavy weather, if in any doubt about the possibility of weather damage;
- .9 if the ship meets any hazard to navigation, such as ice or a derelict; and
- .10 in any other emergency or if in any doubt.

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

42 The officer in charge of the navigational watch shall give watchkeeping personnel all appropriate instructions and information which will ensure the keeping of a safe watch, including a proper look-out.
Watchkeeping under different conditions and in different areas

Clear weather

43 The officer in charge of the navigational watch shall take frequent and accurate compass bearings of approaching ships as a means of early detection of risk of collision and bear in mind that 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. The officer in charge of the navigational watch shall also take early and positive action in compliance with the applicable International Regulations for Preventing Collisions at Sea, 1972 and subsequently check that such action is having the desired effect.

44 In clear weather, whenever possible, the officer in charge of the navigational watch shall carry out radar practice.

Restricted visibility

45 When restricted visibility is encountered or expected, the first responsibility of the officer in charge of the navigational watch is to comply with the relevant rules of the International Regulations for Preventing Collisions at Sea, 1972 with particular regard to the sounding of fog signals, proceeding at a safe speed and having the engines ready for immediate manoeuvre. In addition, the officer in charge of the navigational watch shall:

- .1 inform the master;
- .2 post a proper look-out;
- .3 exhibit navigation lights; and
- .4 operate and use the radar.

In hours of darkness

46 The master and the officer in charge of the navigational watch when arranging look-out duty shall have due regard to the bridge equipment and navigational aids available for use, their limitations; procedures and safeguards implemented.

Coastal and congested waters

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

48 The officer in charge of the navigational watch shall positively identify all relevant navigation marks.

Navigation with pilot on board

49 Despite the duties and obligations of pilots, their presence on board does not relieve the master or officer in charge of the navigational 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/or the officer in charge of the navigational watch shall co-operate closely with the pilot and maintain an accurate check on the ship's position and movement.

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

Ship at anchor

51 If the master considers it necessary, a continuous navigational watch shall be maintained at anchor. While at anchor, the officer in charge of the navigational watch shall:

- .1 determine and plot the ship's position on the appropriate chart as soon as practicable;
- .2 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;
- .3 ensure that proper look-out is maintained;
- .4 ensure that inspection rounds of the ship are made periodically;
- .5 observe meteorological and tidal conditions and the state of the sea;
- .6 notify the master and undertake all necessary measures if the ship drags anchor;
- .7 ensure that the state of readiness of the main engines and other machinery is in accordance with the master's instructions;
- .8 if visibility deteriorates, notify the master;

- .9 ensure that the ship exhibits the appropriate lights and shapes and that appropriate sound signals are made in accordance with all applicable regulations; and
- .10 take measures to protect the environment from pollution by the ship and comply with applicable pollution regulations.

PART 3-2 - PRINCIPLES TO BE OBSERVED IN KEEPING AN ENGINEERING WATCH

52 The term "engineering watch" as used in parts 3-2, 4-2 and 4-4 of this section means either a person or a group of personnel comprising the watch or a period of responsibility for an officer during which the physical presence in machinery spaces of that officer may or may not be required.

53 The 'officer in charge of the engineering watch' is the chief engineer officer's representative and is primarily responsible, at all times, for the safe and efficient operation and upkeep of machinery affecting the safety of the ship and is responsible for the inspection, operation and testing, as required, of all machinery and equipment under the responsibility of the engineering watch.

Watch arrangements

54 The composition of the engineering 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.

55 When deciding the composition of the engineering watch, which may include appropriately qualified ratings, the following criteria, *inter alia*, shall be taken into account:

- .1 the type of ship and the type and condition of the machinery;
- .2 the adequate supervision, at all times, of machinery affecting the safe operation of the ship;
- .3 any special modes of operation dictated by conditions such as weather, ice, contaminated water, shallow water, emergency conditions, damage containment or pollution abatement;
- .4 the qualifications and experience of the engineering watch;
- .5 the safety of life, ship, cargo and port, and protection of the environment;
- .6 the observance of international, national and local regulations; and
- .7 maintaining the normal operations of the ship.

Taking over the watch

56 The officer in charge of the engineering watch shall not hand over the watch to the relieving officer if there is reason to believe that the latter is obviously not capable of carrying out the watchkeeping duties effectively, in which case the chief engineer officer shall be notified.

57 The relieving officer of the engineering watch shall ensure that the members of the relieving engineering watch are apparently fully capable of performing their duties effectively.

58 Prior to taking over the engineering watch, relieving officers shall satisfy themselves regarding at least the following:

- .1 the standing orders and special instructions of the chief engineer officer relating to the operation of the ship's systems and machinery;
- .2 the nature of all work being performed on machinery and systems, the personnel involved and potential hazards.
- .3 the level and, where applicable, the condition of water or residues in bilges, ballast tanks, slop tanks, reserve tanks, fresh water tanks, sewage tanks and any special requirements for use or disposal of the contents thereof;
- .4 the condition and level of fuel in the reserve tanks, settling tank, day tank and other fuel storage facilities;
- .5 any special requirements relating to sanitary system disposals;
- .6 condition and mode of operation of the various main and auxiliary systems, including the electrical power distribution system;
- .7 where applicable, the condition of monitoring and control console equipment, and which equipment is being operated manually;
- .8 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;
- .9 any potentially adverse conditions resulting from bad weather, ice, contaminated or shallow water;
- .10 any special modes of operation dictated by equipment failure or adverse ship conditions;
- .11 the reports of engine-room ratings relating to their assigned duties;
- .12 the availability of fire-fighting appliances; and
- .13 the state of completion of engine-room log.

Performing the engineering watch

59 The officer in charge of the engineering watch shall ensure that the established watchkeeping arrangements are maintained and that under direction, engine-room ratings, if forming part of the engineering watch, assist in the safe and efficient operation of the propulsion machinery and auxiliary equipment.

60 The officer in charge of the engineering watch shall continue to be responsible for machinery-space operations, despite the presence of the chief engineer officer in the machinery spaces, until specifically informed that the chief engineer officer has assumed that responsibility and this is mutually understood.

61 All members of the engineering watch shall be familiar with their assigned watchkeeping duties. In addition, every member shall with respect to the ship they are serving in have knowledge of:

- .1 the use of appropriate internal communication systems;
- .2 the escape routes from machinery spaces;
- .3 the engine-room alarm systems and be able to distinguish between the various alarms with special reference to the fire extinguishing media alarm; and
- .4 the number location and types of fire-fighting equipment and damage control gear in the machinery spaces, together with their use and the various safety precautions to be observed.

62 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.

63 When the machinery spaces are in the manned condition, the officer in charge of the engineering watch shall at all times be readily capable of operating the propulsion equipment in response to needs for changes in direction or speed.

64 When the machinery spaces are in the periodic unmanned condition, the designated duty officer in charge of the engineering watch shall be immediately available and on call to attend the machinery spaces.

65 All bridge orders shall be promptly executed. Changes in direction or speed of the main propulsion units shall be recorded, except where an Administration has determined that the size or characteristics of a particular ship make such recording impracticable. The officer in charge of the engineering watch shall ensure that the main propulsion unit controls, when in the manual mode of operation, are continuously attended under stand-by or manoeuvring conditions.

66 Due attention shall be paid to the ongoing maintenance and support of all machinery, including mechanical, electrical, electronic, 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.

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

68 When the engine-room is put in a stand-by condition, the officer in charge of the engineering 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.

69 Officers in charge of an engineering watch shall not be assigned or undertake any duties which would interfere with their supervisory duties in respect of the main propulsion system and ancillary equipment. They shall keep the main propulsion plant and auxiliary systems under constant supervision until properly relieved, and shall periodically inspect the machinery in their charge. They shall also ensure that adequate rounds 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.

70 Officers in charge of an engineering watch shall direct any other member of the engineering watch to inform them of potentially hazardous conditions which may adversely affect the machinery or jeopardize the safety of life or of the ship.

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

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

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

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

- .1 isolating and bypassing machinery to be worked on;
- .2 adjusting the remaining plant to function adequately and safely during the maintenance period;
- .3 recording, in the engine-room log or other suitable document, the equipment worked on and the personnel involved, and which safety steps have been taken and by whom, for the benefit of relieving officers and for record purposes; and
- .4 testing and putting into service, when necessary, the repaired machinery or equipment.

75 The officer in charge of the engineering watch shall 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.

76 The officer in charge of the engineering watch shall bear in mind that changes in speed, resulting from machinery malfunction, or any loss of steering, may imperil the safety of the ship and life at sea. The bridge shall be immediately notified, in the event of fire, and of any impending action in machinery spaces that may cause reduction in the 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 action is possible to avoid a potential marine casualty.

77 The officer in charge of the engineering watch shall notify the chief engineer officer without delay:

- .1 when engine damage or a malfunction occurs which may be such as to endanger the safe operation of the ship;
- .2 when any malfunction occurs which, it is believed, may cause damage or breakdown of propulsion machinery, auxiliary machinery or monitoring and governing systems; and
- .3 in any emergency or if in any doubt as to what decision or measures to take.

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

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

Engineering watchkeeping under different conditions and in different areas

Restricted visibility

80 The officer in charge of the engineering watch shall ensure that permanent air or steam pressure is available for sound signals and that at all times bridge orders relating to changes in speed or direction of operation are immediately implemented and, in addition, that auxiliary machinery used for manoeuvring is readily available.

Coastal and congested waters

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

Ship at anchor

82 At an unsheltered anchorage the chief engineer officer shall consult with the master whether or not to maintain the same engineering watch as when underway.

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

- .1 an efficient engineering watch is kept;
- .2 periodic inspection is made of all operating and stand-by machinery;
- .3 main and auxiliary machinery is maintained in a state of readiness in accordance with orders from the bridge;
- .4 measures are taken to protect the environment from pollution by the ship, and that applicable pollution prevention regulations are complied with; and
- .5 all damage control and fire-fighting systems are in readiness.

PART 3-3 - PRINCIPLES TO BE OBSERVED IN KEEPING A RADIO WATCH

General provisions

84 Administrations shall direct the attention of companies, masters and radio watchkeeping personnel to comply with the following provisions to ensure that an adequate safety radio watch is maintained while a ship is at sea. In complying with this Code, account shall be taken of the Radio Regulations.

Watch arrangements

85 In deciding the arrangements for the radio watch, the master of every seagoing ship shall:

- .1 ensure that the radio watch is maintained in accordance with the relevant provisions of the Radio Regulations and the SOLAS Convention;
- .2 ensure that the primary duties for radio watchkeeping are not adversely affected by attending to radio traffic not relevant to the safe movement of the ship and safety of navigation; and
- .3 take into account the radio equipment fitted on board and its operational status.

Performing the radio watch

86 The radio operator performing radio watchkeeping duties shall:

- .1 ensure that watch is maintained on the frequencies specified in the Radio Regulations and the SOLAS Convention; and

- .2 while on duty regularly check the operation of the radio equipment and its sources of energy and report to the master any observed failure of this equipment.

87 The requirements of the Radio Regulations and the SOLAS Convention on keeping a radiotelegraph or radio log, as appropriate, shall be complied with.

88 The maintenance of radio records, in compliance with the requirements of the Radio Regulations and the SOLAS Convention is the responsibility of the radio operator designated as having primary responsibility for radiocommunications during distress incidents. The following shall be recorded, together with the times at which they occur:

- .1 a summary of distress, urgency and safety radiocommunications;
- .2 important incidents relating to the radio service;
- .3 where appropriate, the position of the ship at least once per day; and
- .4 a summary of the condition of the radio equipment including its sources of energy.

89 The radio records shall be kept at the distress communications operating position, and shall be made available:

- .1 for inspection by the master; and
- .2 for inspection by any authorized official of the Administration and by any duly authorized officer exercising control under article X of the Convention.

PART 4 - WATCHKEEPING IN PORT

Principles applying to all watchkeeping

General

90 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. Special requirements may be necessary for special types of ships' propulsion systems or ancillary equipment and for ships carrying hazardous, dangerous, toxic or highly flammable materials or other special types of cargo.

Watch arrangements

- 91 Arrangements for keeping a deck watch when the ship is in port shall at all times be adequate to:
- .1 ensure the safety of life, of the ship, the port and the environment, and the safe operation of all machinery related to cargo operation;
 - .2 observe international, national and local rules; and
 - .3 maintain order and the normal routine of the ship.

92 The master shall decide the composition and duration of the deck watch depending on the conditions of mooring, type of the ship and character of duties.

93 If the master considers it necessary, a qualified officer shall be in charge of the deck watch.

94 The necessary equipment shall be so arranged as to provide for efficient watchkeeping.

95 The chief engineer officer, in consultation with the master, shall 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:

- .1 on all ships of 3,000 kW propulsion power and over there shall always be an officer in charge of the engineering watch;
- .2 on ships of less than 3,000 kW propulsion power there may be, at the master's discretion and in consultation with the chief engineer officer, no officer in charge of the engineering watch; and
- .3 officers, while in charge of an engineering watch, shall not be assigned or undertake any task or duty which would interfere with their supervisory duty in respect of the ship's machinery system.

Taking over the watch

96 Officers in charge of the deck or engineering watch shall not hand over the watch to their relieving officer if they have any reason to believe that the latter is obviously not capable of carrying out watchkeeping duties effectively, in which case the master or chief engineer shall be notified accordingly. Relieving officers of the deck or engineering watch shall ensure that all members of their watch are apparently fully capable of performing their duties effectively.

97 If, at the moment of handing over the deck or engineering watch, an important operation is being performed it shall be concluded by the officer being relieved, except when ordered otherwise by the master or chief engineer officer.

PART 4-1 - TAKING OVER THE DECK WATCH

98 Prior to taking over the deck watch, the relieving officer shall be informed of the following by the officer in charge of the deck watch as to:

- .1 the depth of the water at the berth, the ship's draught, the level and time of high and low waters; the securing of the moorings, the arrangement of anchors and the scope of the anchor chain, and other mooring features important to the safety of the ship; the state of main engines and their availability for emergency use;
- .2 all work to be performed on board the ship; the nature, amount and disposition of cargo loaded or remaining, and any residue on board after unloading the ship;
- .3 the level of water in bilges and ballast tanks;

- .4 the signals or lights being exhibited or sounded;
- .5 the number of crew members required to be on board and the presence of any other persons on board;
- .6 the state of fire-fighting appliances;
- .7 any special port regulations;
- .8 the master's standing and special orders;
- .9 the lines of communication available between the ship and shore personnel, including port authorities, in the event of an emergency arising or assistance being required;
- .10 any other circumstances of importance to the safety of the ship, its crew, cargo or protection of the environment from pollution; and
- .11 the procedures for notifying the appropriate authority of any environmental pollution resulting from ship activities.

99 Relieving officers, before assuming charge of the deck watch, shall verify that:

- .1 the securing of moorings and anchor chain are adequate;
- .2 the appropriate signals or lights are properly exhibited or sounded;
- .3 safety measures and fire protection regulations are being maintained;
- .4 their awareness of the nature of any hazardous or dangerous cargo being loaded or discharged and the appropriate action to be taken in the event of any spillage or fire;
- .5 no external conditions or circumstances imperil the ship and that it does not imperil others.

PART 4-2 - TAKING OVER THE ENGINEERING WATCH

100 Prior to taking over the engineering watch, the relieving officer shall be informed by the officer in charge of the engineering watch as to:

- .1 the standing orders of the day, any special orders relating to the ship operations, maintenance functions, repairs to the ship's machinery or control equipment;
- .2 the nature of all work being performed on machinery and systems on board ship, personnel involved and potential hazards;
- .3 the level and condition, where applicable, of water or residue in bilges, ballast tanks, slop tanks, sewage tanks, reserve tanks and special requirements for the use or disposal of the contents thereof;
- .4 any special requirements relating to sanitary system disposals;
- .5 the condition and state of readiness of portable fire-extinguishing equipment and fixed

fire-extinguishing installations and fire detection systems;

- .6 authorized repair personnel on board engaged in engineering activities, their work locations and repair functions and other authorized persons on board and the required crew;
- .7 any port regulations pertaining to ship effluents, fire-fighting requirements and ship readiness, particularly during potential bad weather conditions;
- .8 the lines of communication available between the ship and shore personnel, including port authorities, in the event of an emergency arising or assistance being required;
- .9 any other circumstance of importance to the safety of the ship, its crew, cargo or the protection of the environment from pollution; and
- .10 the procedures for notifying the appropriate authority of environmental pollution resulting from engineering activities.

101 Relieving officers, before assuming charge of the engineering watch, shall satisfy themselves that they are fully informed by the officer being relieved, as outlined above, and:

- .1 be familiar with existing and potential sources of power, heat and lighting and their distribution;
- .2 know the availability and condition of ship's fuel, lubricants and all water supplies; and
- .3 be ready to prepare the ship and its machinery, as far as is possible, for stand-by or emergency conditions as required.

PART 4-3 - PERFORMING THE DECK WATCH

102 The officer in charge of the deck watch shall:

- .1 make rounds to inspect the ship at appropriate intervals;
- .2 pay particular attention to:
 - .2.1 the condition and securing of the gangway, anchor chain and moorings, especially at the turn of the tide and in berths with a large rise and fall, if necessary, taking measures to ensure that they are in normal working condition,
 - .2.2 the draught, under-keel clearance and the general state of the ship, to avoid dangerous listing or trim during cargo handling or ballasting,
 - .2.3 the weather and sea state,
 - .2.4 the observance of all regulations concerning safety and fire protection,
 - .2.5 the water level in bilges and tanks,
 - .2.6 all persons on board and their location, especially those in remote or enclosed spaces, and

- .2.7 the exhibition and sounding, where appropriate, of lights and signals;
- .3 in bad weather, or on receiving a storm warning, take the necessary measures to protect the ship, persons on board and cargo;
- .4 take every precaution to prevent pollution of the environment by the ship;
- .5 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, its cargo and persons on board, and, if necessary, request assistance from the shore authorities or neighbouring ships;
- .6 be aware of the ship's stability condition 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;
- .7 offer assistance to ships or persons in distress;
- .8 take necessary precautions to prevent accidents or damage when propellers are to be turned; and
- .9 enter in the appropriate log-book all important events affecting the ship.

PART 4-4 - PERFORMING THE ENGINEERING WATCH

103 Officers in charge of the engineering watch shall pay particular attention to:

- .1 the observance of all orders, special operating procedures and regulations concerning hazardous conditions and their prevention in all areas in their charge;
- .2 the instrumentation and control systems, monitoring of all power supplies, components and systems in operation;
- .3 the techniques, methods and procedures necessary to prevent violation of the pollution regulations of the local authorities; and
- .4 the state of the bilges.

104 Officers in charge of the engineering watch shall:

- .1 in emergencies, raise the alarm when in their opinion the situation so demands, and take all possible measures to prevent damage to the ship, persons on board and cargo;
- .2 be aware of the deck 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;
- .3 make frequent rounds of inspection to determine possible equipment malfunction or failure, and take immediate remedial action to ensure the safety of the ship, of cargo

operations, of the port and the environment;

- .4 ensure that the necessary precautions are taken, within their area of responsibility, to prevent accidents or damage to the various electrical, electronic, hydraulic, pneumatic and mechanical systems of the ship;
- .5 ensure that all important events affecting the operation, adjustment or repair of the ship's machinery are satisfactorily recorded.

PART 4-5 - WATCH IN PORT ON SHIPS CARRYING HAZARDOUS CARGO

General

105 The master of every ship carrying cargo that is hazardous, whether explosive, flammable, toxic, health-threatening or environment-polluting, shall ensure that safe watchkeeping arrangements are maintained. On ships carrying hazardous cargo in bulk, this will be achieved 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.

106 On ships carrying hazardous cargo other than in bulk, the master shall take full account of the nature, quantity, packing and stowage of the hazardous cargo and of any special conditions on board, afloat and ashore.

ANNEX 2

SEAFARERS' TRAINING, CERTIFICATION AND WATCHKEEPING (STCW) CODE

PART B

**RECOMMENDED GUIDANCE REGARDING PROVISIONS OF
THE STCW CONVENTION AND ITS ANNEX**

INTRODUCTION

1 This part of the STCW Code contains recommended guidance intended to assist Parties to the STCW Convention and those involved in implementing, applying or enforcing its measures, to give the Convention full and complete effect in a uniform manner.

2 The measures suggested are not mandatory and the examples given are only intended to illustrate how certain Convention requirements may be complied with. However, the recommendations in general represent an approach to the matters concerned which has been harmonized through discussion within IMO involving, where appropriate, consultation with the International Labour Organization, the International Telecommunication Union and the World Health Organization.

3 Observance of the recommendations contained in this part will assist the Organization in achieving its goal of maintaining the highest practicable standards of competence in respect of crews of all nationalities and ships of all flags.

4 Guidance is provided in this part in respect of certain articles of the Convention, in addition to guidance on certain regulations in its Annex. The numbering of the sections of this part therefore corresponds with that of the articles and the regulations of the Convention. As in part A, the text of each section may be divided into numbered parts and paragraphs, but such numbering is unique to that text alone.

GUIDANCE REGARDING PROVISIONS OF THE ARTICLES

Section B-I

Guidance regarding general obligations under the Convention

(No provisions)

Section B-II

Guidance regarding definitions and clarifications

1 The definitions contained in article II of the Convention, and the definitions and clarifications contained in regulation I/1 of its Annex, apply equally to the terms used in parts A and B of this Code. Supplementary definitions which apply only to the provisions of this Code are contained in section A-I/1.

- 2 The definition of "certificate" appearing in article II (c) provides for three possibilities:
 - .1 the Administration may issue the certificate;
 - .2 the Administration may have the certificate issued under its authority; or
 - .3 the Administration may recognize a certificate issued by another Party as provided for in regulation I/10.

Section B-III

Guidance regarding the application of the Convention

- 1 While the definition of "fishing vessel" contained in article II, paragraph (h) excludes vessels used for catching fish, whales, seals, walrus or other living resources of the sea from application of the Convention, vessels not engaged in the catching activity cannot enjoy such exclusion.
- 2 The Convention excludes all wooden ships of primitive build, including junks.

Section B-IV

Guidance regarding the communication of information

In paragraph (1)(b) of article IV, the words "where appropriate" are intended to include:

- .1 the recognition of a certificate issued by another Party; or
- .2 the issue of the Administration's own certificate, where applicable, on the basis of recognition of a certificate issued by another Party.

Section B-V

Guidance regarding other treaties and interpretation

The word "arrangements" in paragraph (1) of article V is intended to include provisions previously established between States for the reciprocal recognition of certificates.

Section B-VI

Guidance regarding certificates

See the guidance given in sections B-II and B-I/2.

A policy statement and an outline of the procedures to be followed should be published for the information of companies operating ships under the flag of the Administration.

Section B-VII

Guidance regarding transitional provisions

Certificates issued for service in one capacity which are currently recognized by a Party as an adequate qualification for service in another capacity, e.g. chief mate certificates recognized for service as master, should continue to be accepted as valid for such service under article VII. This acceptance also applies to such certificates issued under the provisions of paragraph 2 of article VII.

Section B-VIII

Guidance regarding dispensations

A policy statement and an outline of the procedures to be followed should be published for the information of companies operating ships under the flag of the Administration. Guidance should be provided to those officials authorized by the Administration to issue dispensations. Information on action taken should be summarized in the initial report communicated to the Secretary-General in accordance with the requirements of section A-I/7.

Section B-IX

Guidance regarding equivalents

1 Naval certificates may continue to be accepted and certificates of service may continue to be issued to naval officers as equivalents under article IX, provided that the requirements of the Convention are met.

Section B-X

Guidance regarding control

(No provisions - see section B-I/4)

Section B-XI

Guidance regarding the promotion of technical co-operation

1 Governments should provide, or arrange to provide, in collaboration with IMO, assistance to States which have difficulty in meeting the requirements of the Convention and which request such assistance.

2 The importance of adequate training for masters and other personnel serving on board oil, chemical and liquefied gas tankers and ro-ro passenger ships is stressed, and it is recognized that in some cases there may be limited facilities for obtaining the required experience and providing specialized training programmes, particularly in developing countries.

Examination database

3 Parties with maritime training academies or examination centres serving several countries and wishing to establish a database of examination questions and answers are encouraged to do so, on the basis of bilateral co-operation with a country or countries which already have such a database.

Availability of maritime training simulators

5 The IMO Secretariat maintains a list of maritime training simulators, as a source of information for Parties and others, on the availability of different types of simulators for training seafarers, in particular where such training facilities may not be available to them nationally.

6 Parties are urged* to provide information on their national maritime training simulators to the IMO Secretariat and to update the information whenever any change or addition is made to their maritime training simulator facilities.

Information on technical co-operation

7 Information on technical advisory services, access to international training institutions affiliated with IMO, and information on fellowships and other technical co-operation which may be provided by or through IMO may be obtained by contacting the Secretary-General at 4 Albert Embankment, London SE1 7SR, United Kingdom.

(No guidance provided regarding articles XII to XVII.)

GUIDANCE REGARDING PROVISIONS OF THE ANNEX TO THE STCW CONVENTION

CHAPTER I

GUIDANCE REGARDING GENERAL PROVISIONS

Section B-I/1

Guidance regarding definitions and clarifications

1 The definitions contained in article II of the Convention, and the definitions and interpretations contained in regulation I/1 of its Annex, apply equally to the terms used in parts A and B of this Code. Supplementary definitions which apply only to the provisions of this Code are contained in section A-I/1.

2 Officers with capacities covered under the provisions of chapter VII may be designated as polyvalent officer, dual purpose officer or other designations as approved by the Administration, in accordance with the terminology used in the applicable safe manning requirements.

*See MSC/Circ.567 as revised.

3 Ratings qualified to serve in capacities covered under the provisions of chapter VII may be designated as polyvalent ratings or other designations as approved by the Administration, in accordance with the terminology used in the applicable safe manning requirements.

Section B-I/2

Guidance regarding certificates and endorsements

1 Where an endorsement is integrated in the format of a certificate as provided by section A-I/2, paragraph 1, the relevant information should be inserted in the certificate in the manner explained hereunder, except for the omission of the space numbered .2. Otherwise in preparing endorsements attesting the issue of a certificate, the spaces numbered .1 to .17 in the form which follows the text hereunder, should be completed as follows:

- .1 Enter the name of the issuing State.
- .2 Enter the number assigned to the certificate by the Administration.
- .3 Enter the full name of the seafarer to whom the certificate is issued. The name should be the same as that appearing in the seafarer's passport, seafarer's identity certificate and other official documents issued by the Administration.
- .4 The number or numbers of the STCW Convention regulation or regulations under which the seafarer has been found qualified should be entered here, for example:
 - .4.1 II/1, if the seafarer has been found qualified to fill the capacity of officer in charge of a navigational watch,
 - .4.2 III/1, if the seafarer has been found qualified to act as engineer officer in charge of a watch in a manned engine-room, or as designated duty engineer officer in a periodically unmanned engine-room,
 - .4.3 IV/2, if the seafarer has been found qualified to fill the capacity of radio operator,
 - .4.4 VII/1, if the certificate is a functional certificate and the seafarer has been found qualified to perform functions specified in part A of the Code, for example, the function of marine engineering at the management level, and
 - .4.5 III/1 and V/1, if found qualified to act as the engineer officer in charge of a watch in a manned engine-room, or as designated duty engineer officer in a periodically unmanned engine-room in tankers. (See limitations in paragraphs .8 and .10 below)
- .5 Enter the date of expiry of the endorsement. This date should not be later than the date of expiry, if any, of the certificate in respect of which the endorsement is issued, nor later than five years after the date of issue of the endorsement.
- .6 In this column should be entered each of the functions specified in part A of the Code, which the seafarer is qualified to perform. Functions and their associated levels of responsibility are specified in the tables of competence set out in chapters II, III and IV

of part A of the Code, and are also listed for convenient reference in the introduction to part A. When reference is made under .4 above to regulations in chapters II, III or IV it is not necessary to list specific functions.

- .7 In this column should be entered the levels of responsibility at which the seafarer is qualified to perform each of the functions entered in column .6. These levels are specified in the tables of competence set out in chapters II, III and IV of part A of the Code, and are also listed for convenient reference in the introduction to part A.
- .8 A general limitation, such as the requirement to wear corrective lenses when performing duties, should be entered prominently at the top of the limitations column. Limitations applying to the functions listed in column .6 should be entered on the appropriate line against the function concerned, for example:
- .8.1 "Not valid for service in tankers" - if not qualified under chapter V,
- .8.2 "Not valid for service in tankers other than oil tankers" - if qualified under chapter V for service only in oil tankers,
- .8.3 "Not valid for service in ships in which steam boilers form part of the ship's machinery" - if the related knowledge has been omitted in accordance with STCW Code provisions, and
- .8.4 "Valid only on near coastal voyages" if the related knowledge has been omitted in accordance with STCW Code provisions.
- Note:** Tonnage and power limitations need not be shown here if they are already indicated in the title of the certificate and in the capacity entered in column .9.
- .9 The capacity or capacities entered in column .9 should be those specified in the title to the STCW regulation or regulations concerned in the case of certificates issued under chapters II or III, or should be as specified in the applicable safe manning requirements of the Administration, as appropriate.
- .10 A general limitation such as the requirement to wear corrective lenses when performing duties should be entered prominently at the top of this limitations column also. The limitations entered in column .10 should be the same as those shown in column .8 for the functions performed in each capacity entered.
- .11 The number entered in space .11 should be that of the certificate, so that both certificate and endorsement have the same unique number for reference and for location in the register of certificates and/or endorsements, etc.
- .12 The date of original issue of the endorsement should be entered here; it may be the same as, or differ from, the date of issue of the certificate in accordance with the circumstances.
- .13 The name of the official authorized to issue the endorsement should be shown here in block letters below the official's signature.

- .14 The date of birth shown should be the date confirmed from Administration records or as otherwise verified.
- .15 The endorsement should be signed by the seafarer in the presence of an official, or may be incorporated from the seafarer's application form duly completed and verified.
- .16 The photograph should be a standard black and white or colour passport type head and shoulders photograph, supplied in duplicate by the seafarer so that one may be kept in or associated with the register of certificates.
- .17 If the blocks for revalidation are shown as part of the endorsement form (see section A-I/2, paragraph 1), the Administration may revalidate the endorsement by completing the block after the seafarer has demonstrated continuing proficiency as required by regulation I/11.

(Official Seal)

(COUNTRY)

ENDORSEMENT ATTESTING THE ISSUE OF A CERTIFICATE UNDER THE PROVISIONS OF THE
INTERNATIONAL CONVENTION ON STANDARDS OF TRAINING, CERTIFICATION AND
WATCHKEEPING FOR SEAFARERS, 1978, AS AMENDED IN 1995

The Government of **.1** certifies that Certificate No. **.2** has been issued to **.3** who has been found duly qualified in accordance with the provisions of regulation **.4** of the above Convention, as amended, and has been found competent to perform the following functions, at the levels specified, subject to any limitations indicated until **.5** or until the date of expiry of any extension of the validity of this endorsement as may be shown overleaf:

.6 FUNCTION	.7 LEVEL	.8 LIMITATIONS APPLYING (IF ANY)

The lawful holder of this endorsement may serve in the following capacity or capacities specified in the applicable safe manning requirements of the Administration.

.9 CAPACITY	.10 LIMITATIONS APPLYING (IF ANY)

Endorsement No. **.11** issued on **.12**,

(Official Seal)

.....**.13**.....
Signature of duly authorized official

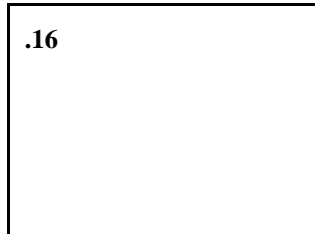
.....
Name of duly authorized official

The original of this endorsement must be kept available in accordance with regulation I/2, paragraph 9 of the Convention while serving on a ship.

Date of birth of the holder of the certificate ... **.14** ...

Signature of the holder of the certificate ... **.15** ...

Photograph of the holder of the certificate



The validity of this endorsement is hereby extended until	
(Official seal)	Signature of duly authorized official
Date of revalidation... .17	Name of duly authorized official
The validity of this endorsement is hereby extended until	
(Official seal)	Signature of duly authorized official
Date of revalidation17	Name of duly authorized official

2 An endorsement attesting the recognition of a certificate may be attached to and form part of the certificate endorsed, or may be issued as a separate document (see STCW regulation I/2, paragraph 6). All entries made in the form are required to be in Roman characters and Arabic figures (see STCW regulation I/2, paragraph 8). The spaces numbered .1 to .17 in the form which follows the text hereunder are intended to be completed as indicated in paragraph 1 above, except in respect of the following spaces:

- .2 where the number assigned by the Party which issued the certificate being recognized should be entered;
- .3 where the name entered should be the same as that appearing in the certificate being recognized;
- .4 where the name of the Party which issued the certificate being recognized should be entered;
- .9 where the capacity or capacities entered in column .9 should be selected, as appropriate, from those specified in the safe applicable manning requirements of the Administration which is recognizing the certificate;
- .11 where the number entered in space .11 should be unique to the endorsement both for reference and for location in the register of endorsements; and
- .12 where the date of original issue of the endorsement should be entered.

3 When replacing a certificate or endorsement which has been lost or destroyed, Parties should issue the replacement under a new number, to avoid confusion with the document to be replaced.

(Official Seal)

(COUNTRY)

ENDORSEMENT ATTESTING THE RECOGNITION OF A CERTIFICATE UNDER THE PROVISIONS OF THE
INTERNATIONAL CONVENTION ON STANDARDS OF TRAINING, CERTIFICATION AND
WATCHKEEPING FOR SEAFARERS, 1978, AS AMENDED IN 1995

The Government of **.1** certifies that Certificate No. **.2** issued to **.3** by or on behalf of the Government of **.4** is duly recognized in accordance with the provisions of regulation I/10 of the above Convention, as amended, and the lawful holder is authorized to perform the following functions, at the levels specified, subject to any limitations indicated until ... **.5** ... or until the date of expiry of any extension of the validity of this endorsement as may be shown overleaf:

.6 FUNCTION	.7 LEVEL	.8 LIMITATIONS APPLYING (IF ANY)

The lawful holder of this endorsement may serve in the following capacity or capacities specified in the applicable safe manning requirements of the Administration:

.9 CAPACITY	.10 LIMITATIONS APPLYING (IF ANY)

Endorsement No. **.11** ... issued on **.12**

(Official Seal)

.....**.13**.....
Signature of duly authorized official

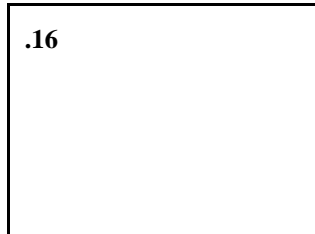
.....
Name of duty authorized official

The original of this endorsement must be kept available in accordance with regulation I/2, paragraph 9 of the Convention while serving on a ship.

Date of birth of the holder of the certificate ... **.14** ...

Signature of the holder of the certificate ... **.15** ...

Photograph of the holder of the certificate



The validity of this endorsement is hereby extended until	
(Official seal)	Signature of duly authorized official
Date of revalidation 17	Name of duly authorized official
The validity of this endorsement is hereby extended until	
(Official seal)	Signature of duly authorized official
Date of revalidation... 17	Name of duly authorized official

Section B-I/3

Guidance regarding near-coastal voyages

1 When a Party defines near-coastal voyages, *inter alia*, for the purposes of applying variations to the subjects listed in column 2 of the standard of competence tables contained in chapters II and III of part A of the Code, II/2 for the issue of certificates valid for service in ships entitled to fly the flag of that Party and engaged on such voyages, account should be taken of the following factors, bearing in mind the effect on the safety of all ships and on the marine environment.

- .1 the type of ship and the trade in which it is engaged;
- .2 the gross tonnage of the ship and the power in kW of the main propulsion machinery;
- .3 the nature and length of the voyages;
- .4 the maximum distance from a port of refuge;
- .5 the adequacy of the coverage and accuracy of navigational position-fixing devices;
- .6 the weather conditions normally prevailing in the near-coastal voyage area;
- .7 the provision of shipboard and coastal communication facilities for search and rescue.

2 A Party which includes voyages off another Party's coast within the limits of its near-coastal voyage definition, may enter into a bilateral agreement with the Party concerned.

3 It is not intended that ships engaged on near-coastal voyages should extend their voyages world-wide, under the excuse that they are navigating constantly within the limits of designated near-coastal voyages of neighbouring Parties.

Section B-I/4

Guidance regarding control procedures*

Introduction

1 The purpose of the control procedures of regulation I/4 is to enable officers duly authorized by port States to ensure that the seafarers on board have sufficient competence to ensure safe and pollution-free operation of the ship.

2 This provision is no different in principle from the need to make checks on ships' structures and equipment. Indeed, it builds on these inspections to make an appraisal of the total system of on-board safety and pollution prevention.

*IMO Model Course 3.09 - Port State Control may be of assistance in the preparation of courses.

Assessment

3 By restricting assessment as indicated in section A-I/4, the subjectivity which is an unavoidable element in all control procedures, is reduced to a minimum, no more than would be evident in other types of control inspection.

4 The clear grounds given in regulation I/4, paragraph 1.3 will usually be sufficient to direct the inspector's attention to specific areas of competency, which could then be followed up by seeking evidence of training in the skills in question. If this evidence is inadequate or unconvincing, the authorized officer may ask to observe a demonstration of the relevant skill.

5 It will be a matter for the professional judgement of the inspector when on board, either following an incident as outlined in regulation I/4 or for the purposes of a routine inspection, whether the ship is operated in a manner likely to pose a danger to persons, property or the environment.*

Section B-I/5

Guidance regarding national provisions

(No provisions)

Section B-I/6

Guidance regarding training and assessment

Qualifications of instructors and assessors

1 Each Party should ensure that instructors and assessors are appropriately qualified and experienced for the particular types and levels of training or assessment of competence of seafarers, as required under the Convention, in accordance with the guidelines in this section.

In-service training and assessment

2 Any person on board or ashore conducting in-service training of a seafarer intended to be used in qualifying for certification under the Convention should have received appropriate guidance in instructional techniques.**

3 Any person responsible for the supervision of in-service training of a seafarer intended to be used in qualifying for certification under the Convention should have appropriate knowledge of instructional techniques and of training methods and practice.

4 Any person, on board or ashore, conducting an in-service assessment of the competence of a

*IMO Model Course 3.11 - Marine Accident and Incident Investigation may be of assistance in the preparation courses.

**IMO Model Courses 6.09 - Training Course for Instructors, Volume 1 may be of assistance in the preparation of courses.

seafarer intended to be used in qualifying for certification under the Convention, should have:

- .1 received appropriate guidance in assessment methods and practice^{*}; and
- .2 gained practical assessment experience under the supervision and to the satisfaction of an experienced assessor.

5 Any person responsible for the supervision of the in-service assessment of competence of a seafarer intended to be used in qualifying for certification under the Convention, should have a full understanding of the assessment system, assessment methods and practice.^{*}

Section B-I/7

Guidance regarding communication of information

Reports of difficulties encountered

Parties are requested to include in the reports required by regulation I/7 an indication of any relevant guidance contained in part B of this Code, the observance of which has been found to be impracticable.

Section B-I/8

Guidance regarding quality standards

1 In applying quality standards under the provisions of regulation I/8 and section A-I/8 to the administration of its certification system, each Party should take account of existing national or international models, and incorporate the following key elements:

- .1 an expressed policy regarding quality and the means by which such policy is to be implemented;
- .2 a quality system incorporating the organizational structure, responsibilities, procedures, processes and resources necessary for quality management;
- .3 the operational techniques and activities to ensure quality control;
- .4 systematic monitoring arrangements including internal quality assurance evaluations, to ensure that all defined objectives are being achieved; and
- .5 arrangements for periodic external quality evaluations as described in the following paragraphs.

^{*}IMO Model Course 3.12 - Examination and Certification of Seafarers may be of assistance in the preparation of courses.

- 2 In establishing such quality standards for the administration of their national certification system, Administrations should seek to ensure that the arrangements adopted:
- .1 are sufficiently flexible to enable the certification system to take account of the varying needs of the industry, and that they facilitate and encourage the application of new technology;
 - .2 cover all the administrative matters that give effect to the various provisions of the Convention, in particular regulations I/2 to I/15 and other provisions which enable the Administration to grant certificates of service and dispensations and to withdraw, cancel and suspend certificates;
 - .3 encompass the Administration's responsibilities for approving training and assessment at all levels, from undergraduate-type courses and updating courses for certificates of competency to short courses of vocational training; and
 - .4 incorporate arrangements for the internal quality assurance reviews under paragraph 1.4 involving a comprehensive self-study of the administrative procedures, at all levels, in order to measure achievement of defined objectives and to provide the basis for the independent external evaluation required under section A-1/8, paragraph 3.

Quality standards model for assessment of knowledge, understanding, skills and competence

- 3 The quality standards model for assessment of knowledge, understanding, skills and competence should incorporate the recommendations of this section within the general framework of either:
- .1 a national scheme for education and training accreditation or quality standards; or
 - .2 an alternative quality standards model acceptable to the Organization.
- 4 The above quality standards model should incorporate:
- .1 a quality policy, including a commitment by the training institution or unit to the achievement of its stated aims and objectives, and to the consequential recognition by the relevant accrediting or quality standards authority;
 - .2 those quality management functions that determine and implement the quality policy, relating to aspects of the work which impinge on the quality of what is provided, including provisions for determining progression within a course or programme;
 - .3 quality system coverage, where appropriate, of the academic and administrative organizational structure, responsibilities, procedures, processes and the resources of staff and equipment;
 - .4 the quality control functions to be applied at all levels to the teaching, training, examination and assessment activities, and to their organization and implementation, in order to ensure their fitness for their purpose and the achievement of their defined objectives;

- .5 the internal quality assurance processes and reviews which monitor the extent to which the institution, or training unit, is achieving the objectives of the programmes it delivers, and is effectively monitoring the quality control procedures which it employs; and
- .6 the arrangements made for periodic external quality evaluations required under regulation I/8, paragraph 2 and described in the following paragraphs, for which the outcome of the quality assurance reviews forms the basis and starting point.

5 In establishing quality standards for education, training and assessment programmes, the organizations responsible for implementing these programmes should take account of the following:

- .1 Where provisions exist for established national accreditation, or education quality standards, such provisions should be utilized for courses incorporating the knowledge and understanding requirements of the Convention. The quality standards should be applied to both management and operational levels of the activity, and should take account of how it is managed, organized, undertaken and evaluated, in order to ensure that the identified goals are achieved.
- .2 Where acquisition of a particular skill or accomplishment of a designated task is the primary objective, the quality standards should take account of whether real or simulated equipment is utilized for this purpose, and of the appropriateness of the qualifications and experience of the assessors, in order to ensure achievement of the set standards.
- .3 The internal quality assurance evaluations should involve a comprehensive self-study of the programme, at all levels, to monitor achievement of defined objectives through the application of quality standards. These quality assurance reviews should address the planning, design, presentation and evaluation of programmes as well as the teaching, learning and communication activities. The outcome provides the basis for the independent evaluation required under section A-1/8, paragraph 3.

The independent evaluation

6 Each independent evaluation should include a systematic and independent examination of all quality activities, but should not evaluate the validity of the defined objectives. The evaluation team should:

- .1 carry out the evaluation in accordance with documented procedures;
- .2 ensure that the results of each evaluation are documented and brought to the attention of those responsible for the area evaluated; and
- .3 check that timely action is taken to correct any deficiencies.

7 The purpose of the evaluation is to provide an independent assessment of the effectiveness of the quality standard arrangements at all levels. In the case of an education or training establishment a recognized academic accreditation or quality standards body or Government agency should be used. The evaluation team should be provided with sufficient advance information to give an overview of the tasks in hand. In the case of a major training institution or programme, the following items are indicative of the information to be provided:

- .1 the mission statement of the institution;
- .2 details of academic and training strategies in use;
- .3 an organization chart and information on the composition of committees and advisory bodies;
- .4 staff and student information;
- .5 a description of training facilities and equipment; and
- .6 an outline of the policies and procedures on:
 - .6.1 student admission,
 - .6.2 the development of new courses and review of existing courses,
 - .6.3 the examination system, including appeals and resits,
 - .6.4 staff recruitment, training, development, appraisal and promotion,
 - .6.5 feedback from students and from industry, and
 - .6.6 staff involvement in research and development.

The report

8 Before submitting a final report, the evaluation team should forward an interim report to the management seeking their comments on their findings. Upon receiving their comments, the evaluators should submit their final report, which should:

- .1 include brief background information about the institution or training programme;
- .2 be full, fair and accurate;
- .3 highlight the strengths and weaknesses of the institution;
- .4 describe the evaluation procedure followed;
- .5 cover the various elements identified in paragraph 4;
- .6 indicate the extent of compliance or non-compliance with the requirements of the Convention and the effectiveness of the quality standards in ensuring achievement of defined aims and objectives; and
- .7 spell out clearly the areas found deficient, offer suggestions for improvement and provide any other comments the evaluators consider relevant.

Section B-1/9

Guidance regarding medical standards - Issue and registration of certificates

Medical examination and certification

- 1 The standards developed pursuant to regulation I/9, paragraph 1, should take into account the views of recognized medical practitioners experienced in medicine as applied in the maritime environment.
- 2 The medical standards may differentiate between those persons seeking to start a career at sea and those seafarers already serving at sea. In the former case, for example, it might be appropriate to designate higher standards in certain areas, while in the latter case some reduction may be made for age.
- 3 The standards should, so far as possible, define objective criteria with regard to fitness for sea service, taking into account access to medical facilities and medical expertise on board ship. They should, in particular, specify the conditions under which seafarers suffering from potentially life-threatening medical conditions controlled by medication may be allowed to continue to serve at sea.
- 4 The medical standards should also identify particular medical conditions, such as colour blindness, which might disqualify seafarers from holding particular positions on board ship.
- 5 Medical examinations and certification of seafarers under the standards should be conducted by one or more medical practitioners recognized by the Party. A list of medical practitioners so recognized should be made available to other Parties and to companies on request.
- 6 In the absence of mandatory international eyesight standards for seafarers, Parties should regard the minimum in-service eyesight standards set out in paragraphs 7 to 11 and table B-I/9 hereunder as the minimum for the safe operation of ships, and report on maritime casualties where poor eyesight has contributed to such incidents.
- 7 Each Administration has the discretionary authority to grant a variance or waiver of any of the standards set out in table B-I/9 hereunder, based on an assessment of a medical evaluation and any other relevant information concerning an individual's adjustment to the condition and proven ability to satisfactorily perform assigned shipboard functions. However, if the aided distant visual acuity of either eye is less than the standard, the aided distant visual acuity in the better eye should be at least 0.2 higher than the standard indicated in the table. The unaided distant visual acuity in the better eye should be at least 0.1.
- 8 Persons requiring the use of spectacles or contact lenses to perform duties should have a spare pair conveniently available on board the ship. Any need to wear visual aids to meet the required standards should be recorded on each certificate and endorsement issued.
- 9 Eyes of seafarers should be free of disease. Any permanent or progressing debilitating pathology without recovery should be cause for a determination of unfitness.
- 10 All tests needed to determine the visual fitness of a seafarer must be reliable and performed by a competent person recognized by the Administration.

11 Notwithstanding these provisions, the Administration may require higher standards than those given in table B-I/9 below.

Issue and registration of certificates

Approval of seagoing service

12 In approving seagoing service required by the Convention, Parties should ensure that the service concerned is relevant to the qualification being applied for, bearing in mind that, apart from the initial familiarization with service in seagoing ships, the purpose of such service is to allow the seafarer to be instructed in and to practise, under appropriate supervision, those safe and proper seagoing practices, procedures and routines which are relevant to the qualification applied for.

Approval of training courses

13 In approving training courses and programmes, Parties should take into account that the various IMO Model Courses identified by footnotes in Part A of this Code can assist in the preparation of such courses and programmes and ensure that the detailed learning objectives recommended therein are suitably covered.

Electronic access to registers

14 Where the register or registers of certificates, endorsements and other documents issued by or on behalf of a Party are maintained by electronic means, provision should be made to allow controlled electronic access to such register or registers to allow Administrations and companies to confirm:

- .1 the name of the seafarer to whom a certificate, endorsement or other qualification was issued, its relevant number, date of issue, and date of expiry;
- .2 the capacity in which the holder may serve and any limitations attaching thereto; and
- .3 the functions the holder may perform, the levels authorized and any limitations attaching thereto.

MINIMUM IN-SERVICE EYESIGHT STANDARDS

Table B-I/9

STCW Convention Regulation	Category of seafarer	Distance	Vision *	Near/immediate vision	Colour vision	Visual fields	Night blindness	Diplopia (double vision)
		one eye	other eye	Both eyes together Aided or unaided				
I/11 II/1 II/2 II/3 II/4	Masters, deck officers and ratings required to undertake look-out duties Aided: Unaided:	0.5** 0.1	0.5 0.1	Vision required for ships' navigation (e.g. chart and nautical publication reference, use of bridge instrumentation and equipment, and identification of aids to navigation)	Normal visual fields	Vision required to perform all necessary functions in darkness without compromise	No significant condition evident	
I/11 III/1 III/2 III/3 III/4	All engineer officers and ratings forming part of an engine-room watch Aided: Unaided:	0.4 0.1	0.4 0.1	Vision required to read instruments in close proximity, to operate equipment, and to identify systems/components as necessary	Sufficient visual fields	Vision required to perform all necessary functions in darkness without compromise	No significant condition evident	
I/11 IV/2	Radio officers and electrical/electronic officers: Aided: Unaided:	0.4 0.1	0.4 0.1	Vision required to read instruments in close proximity, to operate equipment, and to identify systems/components as necessary	Sufficient visual fields	Vision required to perform all necessary functions in darkness without compromise	No significant condition evident	
<p>*Note: Values given in Snellen decimal notation</p> <p>**Note: A value of at least 0.7 in one eye is recommended to reduce the risk of undetected underlying eye disease</p>								

Section B-I/10

Guidance regarding the recognition of certificates

(No provisions)

Section B-I/11

Guidance regarding the revalidation of certificates

The courses required by regulation I/11 should include relevant changes in marine technology and recommendations concerning the safety of life at sea and the protection of the marine environment.

Section B-I/12

Guidance regarding the use of simulators

1 When simulators are being used for training or assessment of competency, the following guidelines should be taken into consideration in conducting any such training or assessment.*

Training and assessment in radar observation and plotting**

2 Training and assessment in radar observation and plotting should:

- .1 incorporate the use of radar simulation equipment; and
- .2 conform to standards not inferior to those given in paragraphs 3 to 17 below.

3 Demonstrations of and practice in radar observation should be undertaken where appropriate on live marine radar equipment, including the use of simulators. Plotting exercises should preferably be undertaken in real time, in order to increase trainees' awareness of the hazards of the improper use of radar data and improve their plotting techniques to a standard of radar plotting commensurate with that necessary for the safe execution of collision avoidance manoeuvring under actual seagoing conditions.

Theory factors affecting performance and accuracy

4 An elementary understanding should be attained of the principles of radar, together with a full practical knowledge of:

- .1 range and bearing measurement, characteristics of the radar set which determine the quality of the radar display, radar antennae, polar diagrams, the effects of power radiated in directions outside the main beam, a non-technical description of the radar system

*The current edition of the ILO/IMO Document for Guidance may be of assistance in the preparation of courses.

**The following IMO Model Courses may be of assistance in the preparation of courses:

- .1 IMO Model Course 1.07 - Radar Observation and Plotting
- .2 IMO Model Course 1.09 - Radar Simulator

including variations in the features encountered in different types of radar set, performance monitors and equipment factors which affect maximum and minimum detection ranges and accuracy of information;

- .2 the current marine radar performance specification adopted by the Organization;*
- .3 the effects of the siting of the radar antenna, shadow sectors and arcs of reduced sensitivity, false echoes, effects of antenna height on detection ranges and of siting radar units and storing spares near magnetic compasses, including magnetic safe distances; and
- .4 radiation hazards and safety precautions to be taken in the vicinity of antenna and open wave guides.

Detection of misrepresentation of information, including false echoes and sea returns

5 A knowledge of the limitations to target detection is essential, to enable the observer to estimate the dangers of failure to detect targets. The following factors should be emphasized:

- .1 performance standard of the equipment;
- .2 brilliance, gain and video processor control settings;
- .3 radar horizon;
- .4 size, shape, aspect and composition of targets;
- .5 effects of the motion of the ship in a seaway;
- .6 propagation conditions;
- .7 meteorological conditions; sea clutter and rain clutter;
- .8 anti-clutter control settings;
- .9 shadow sectors; and
- .10 radar-to-radar interference.

6 A knowledge should be attained of factors which might lead to faulty interpretation, including false echoes, effects of nearby pylons and large structures, effects of power lines crossing rivers and estuaries, echoes from distant targets occurring on second or later traces.

7 A knowledge should be attained of aids to interpretation, including corner reflectors and radar beacons; detection and recognition of land targets; the effects of topographical features; effects of pulse length and beam width; radar conspicuous and inconspicuous targets; factors which affect the echo strength from targets.

*See resolution A.477(XII) - Performance standards for radar equipment.

PRACTICE

Setting up and maintaining displays

- 8 A knowledge should be attained of:
- .1 the various types of radar display mode; unstabilized ship's-head-up relative motion; ship's-head-up course-up and north-up stabilized relative motion and true motion;
 - .2 the effects of errors on the accuracy of information displayed; effects of transmitting compass errors on stabilized and true motion displays; effects of transmitting log errors on a true motion display; and the effects of inaccurate manual speed settings on a true motion display;
 - .3 methods of detecting inaccurate speed settings on true motion controls; the effects of receiver noise limiting ability to display weak echo returns, and the effects of saturation by receiver noise, etc.; the adjustment of operational controls; criteria which indicate optimum points of adjustment; the importance of proper adjustment sequence, and the effects of maladjusted controls; the detection of maladjustments and corrections of:
 - .3.1 controls affecting detection ranges, and
 - .3.2 controls affecting accuracy;
 - .4 the dangers of using radar equipment with maladjusted controls; and
 - .5 the need for frequent regular checking of performance, and the relationship of the performance indicator to the range performance of the radar set.

Range and bearing

- 9 A knowledge should be attained of:
- .1 the methods of measuring ranges; fixed range markers and variable range markers;
 - .2 the accuracy of each method and the relative accuracy of the different methods;
 - .3 how range data are displayed; ranges at stated intervals, digital counter and graduated scale;
 - .4 the methods of measuring bearings; rotatable cursor on transparent disc covering the display, electronic bearing cursor and other methods;
 - .5 bearing accuracy and inaccuracies caused by: parallax, heading marker displacement, centre maladjustment;
 - .6 how bearing data are displayed; graduated scale and digital counter; and
 - .7 the need for regular checking of the accuracy of ranges and bearings, methods of checking for inaccuracies and correcting or allowing for inaccuracies.

Plotting techniques and relative motion concepts

10 Practice should be provided in manual plotting techniques, including the use of reflection plotters, with the objective of establishing a thorough understanding of the interrelated motion between own ship and other ships, including the effects of manoeuvring to avoid collision. At the preliminary stages of this training, simple plotting exercises should be designed to establish a sound appreciation of plotting geometry and relative motion concepts. The degree of complexity of exercises should increase throughout the training course until the trainee has mastered all aspects of the subject. Competence can best be enhanced by exposing the trainee to real-time exercises performed on a simulator or using other effective means.

Identification of critical echoes

- 11 A thorough understanding should be attained of:
- .1 position fixing by radar from land targets and sea marks;
 - .2 the accuracy of position fixing by ranges and by bearings;
 - .3 the importance of cross-checking the accuracy of radar against other navigational aids; and
 - .4 the value of recording ranges and bearings at frequent, regular intervals when using radar as an aid to collision avoidance.

Course and speed of other ships

- 12 A thorough understanding should be attained of:
- .1 the different methods by which course and speed of other ships can be obtained from recorded ranges and bearings including:
 - .1.1 the unstabilized relative plot,
 - .1.2 the stabilized relative plot, and
 - .1.3 the true plot; and
 - .2 the relationship between visual and radar observations, including detail and the accuracy of estimates of course and speed of other ships, and the detection of changes in movements of other ships.

Time and distance of closest approach of crossing, meeting or overtaking ships

- 13 A thorough understanding should be attained of:
- .1 the use of recorded data to obtain:
 - .1.1 measurement of closest approach distance and bearing, and

- .1.2 time to closest approach, and
- .2 the importance of frequent, regular observations.

Detecting course and speed changes of other ships

- 14 A thorough understanding should be attained of:
- .1 the effects of changes of course and/or speed by other ships on their tracks across the display;
 - .2 the delay between change of course or speed and detection of that change; and
 - .3 the hazards of small changes as compared with substantial changes of course or speed in relation to rate and accuracy of detection.

Effects of changes in own ship's course or speed or both

15 A thorough understanding of the effects on a relative motion display of own ship's movements, and the effects of other ships' movements and the advantages of compass stabilization of a relative display.

- 16 In respect of true motion displays, a thorough understanding should be attained of:
- .1 the effects of inaccuracies of:
 - .1.1 speed and course settings, and
 - .1.2 of compass stabilization data driving a stabilized relative motion display;
 - .2 the effects of changes in course or speed or both by own ship on tracks of other ships on the display; and
 - .3 the relationship of speed to frequency of observations.

Application of the International Regulations for Preventing Collisions at Sea

17 A thorough understanding should be attained of the relationship of the International Regulations for Preventing Collisions at Sea to the use of radar, including:

- .1 action to avoid collision, dangers of assumptions made on inadequate information and the hazards of small alterations of course or speed;
- .2 the advantages of safe speed when using radar to avoid collision;
- .3 the relationship of speed to closest approach distance and time and to the manoeuvring characteristics of various types of ships;
- .4 the importance of radar observation reports and radar reporting procedures being well defined;

- .5 the use of radar in clear weather, to obtain an appreciation of its capabilities and limitations, compare radar and visual observations and obtain an assessment of the relative accuracy of information;
- .6 the need for early use of radar in clear weather at night and when there are indications that visibility may deteriorate;
- .7 comparison of features displayed by radar with charted features; and
- .8 comparison of the effects of differences between range scales.

Training and assessment in the operational use of automatic radar plotting aids (ARPA)

18 Training and assessment in the operational use of automatic radar plotting aids (ARPA) should:

- .1 require prior completion of the training in radar observation and plotting or combine that training with the training given in paragraphs 19 to 36 below;*
- .2 incorporate the use of ARPA simulation equipment; and
- .3 conform to standards not inferior to those given in paragraphs 19 to 36 below.

19 Where ARPA training is provided as part of the general training under the 1978 STCW Convention, masters, chief mates and officers in charge of a navigational watch should understand the factors involved in decision-making based on the information supplied by ARPA in association with other navigational data inputs, having a similar appreciation of the operational aspects and of system errors of modern electronic navigational systems. This training should be progressive in nature, commensurate with the responsibilities of the individual and the certificates issued by Parties under the 1978 STCW Convention.

Theory and Demonstration

Possible risks of over-reliance on ARPA

20 Appreciation that ARPA is only a navigational aid and:

- .1 that its limitations, including those of its sensors, make over-reliance on ARPA dangerous, in particular for keeping a look-out; and
- .2 the need to observe at all times the Principles to be observed in keeping a navigational watch and the Guidance on keeping a navigational watch.

*IMO Model Course 1.08 - The Operational Use of Automatic Radar Plotting Aids (ARPA) may be of assistance in the preparation of courses.

Principal types of ARPA systems and their display characteristics

21 Knowledge of the principal types of ARPA systems in use; their various display characteristics and an understanding of when to use ground or sea stabilized modes and north-up, course-up or head-up presentations.

IMO performance standards for ARPA

22 An appreciation of the IMO performance standards for ARPA, in particular the standards relating to accuracy.*

Factors affecting system performance and accuracy

23 Knowledge of ARPA sensor input performance parameters - radar, compass and speed inputs and the effects of sensor malfunction on the accuracy of ARPA data.

24 Knowledge of:

- .1 the effects of the limitations of radar range and bearing discrimination and accuracy and the limitations of compass and speed input accuracies on the accuracy of ARPA data; and
- .2 factors which influence vector accuracy.

Tracking capabilities and limitations

25 Knowledge of:

- .1 the criteria for the selection of targets by automatic acquisition;
- .2 the factors leading to the correct choice of targets for manual acquisition;
- .3 the effects on tracking of "lost" targets and target fading;
- .4 the circumstances causing "target swap" and its effects on displayed data.

Processing delays

26 Knowledge of the delays inherent in the display of processed ARPA information, particularly on acquisition and re-acquisition or when a tracked target manoeuvres.

Operational warnings, their benefits and limitations

27 Appreciation of the uses, benefits and limitations of ARPA operational warnings and their correct setting, where applicable, to avoid spurious interference.

*See resolution A.422(XI) - Performance standards for automatic radar plotting aids (ARPA).

System operational tests

- 28 Knowledge of:
- .1 methods of testing for malfunctions of ARPA systems including functional self-testing; and
 - .2 precautions to be taken after a malfunction occurs.

Manual and automatic acquisition of targets and their respective limitations

- 29 Knowledge of the limits imposed on both types of acquisition in multi-target scenarios, and the effects on acquisition of target fading and target swap.

True and relative vectors and typical graphic representation of target information and danger areas

- 30 Thorough knowledge of true and relative vectors; derivation of targets' true courses and speeds including:
- .1 threat assessment, derivation of predicted closest point of approach and predicted time to closest point of approach from forward extrapolation of vectors, the use of graphic representation of danger areas;
 - .2 the effects of alterations of course and/or speed of own ship and/or targets on predicted closest point of approach and predicted time to closest point of approach and danger areas;
 - .3 the effects of incorrect vectors and danger areas; and
 - .4 the benefit of switching between true and relative vectors.

Information on past position of targets being tracked

- 31 Knowledge of the derivation of past positions of targets being tracked, recognition of historic data as a means of indicating recent manoeuvring of targets and as a method of checking the validity of the ARPA's tracking.

Practice

Setting up and maintaining displays

- 32 Ability to demonstrate:
- .1 the correct starting procedure to obtain the optimum display of ARPA information;
 - .2 the selection of display presentation; stabilized relative motion displays and true motion displays;
 - .3 the correct adjustment of all variable radar display controls for optimum display of data;

- .4 the selection, as appropriate, of required speed input to ARPA;
- .5 the selection of ARPA plotting controls, manual/automatic acquisition, vector/graphic display of data;
- .6 the selection of the time scale of vectors/graphics;
- .7 the use of exclusion areas when automatic acquisition is employed by ARPA; and
- .8 performance checks of radar, compass, speed input sensors and ARPA.

System operational tests

33 Ability to perform system checks and determine data accuracy of ARPA, including the trial manoeuvre facility, by checking against basic radar plot.

Obtaining information from the ARPA display

34 Demonstrate the ability to obtain information in both relative and true motion modes of display, including:

- .1 the identification of critical echoes;
- .2 the speed and direction of target's relative movement;
- .3 the time to, and predicted range at, target's closest point of approach;
- .4 the courses and speeds of targets;
- .5 detecting course and speed changes of targets and the limitations of such information;
- .6 the effect of changes in own ship's course or speed or both; and
- .7 the operation of the trial manoeuvre facility.

Application of the International Regulations for Preventing Collisions at Sea

35 Analysis of potential collision situations from displayed information, determination and execution of action to avoid close-quarters situations in accordance with the International Regulations for Preventing Collisions at Sea in force.

Recommended performance standards for non-mandatory types of simulation

36 Performance standards for non-mandatory simulation equipment used for training and/or assessment of competence or demonstration of skills are set out hereunder. Such forms of simulation include, but are not limited to, the following types:

- .1 navigation and watchkeeping;
- .2 shiphandling and manoeuvring;
- .3 cargo handling and stowage;
- .4 radiocommunications; and
- .5 main and auxiliary machinery operation

Navigation and watchkeeping simulation

37 Navigation and watchkeeping simulation equipment should, in addition to meeting all applicable performance standards set out in section A-I/12, be capable of simulating navigational equipment and bridge operational controls which meet all applicable performance standards adopted by the Organization,* incorporate facilities to generate soundings and:

- .1 create a real-time operating environment, including navigation control and communications instruments and equipment appropriate to the navigation and watchkeeping tasks to be carried out and the manoeuvring skills to be assessed;
- .2 provide a realistic visual scenario by day or by night, including variable visibility, or by night only as seen from the bridge, with a minimum horizontal field of view available to the trainee in viewing sectors appropriate to the navigation and watchkeeping tasks and objectives; and
- .3 realistically simulate 'own ship' dynamics in open water conditions including the effects of weather, tidal stream, currents and interaction with other ships.

Ship handling and manoeuvring simulation

38 In addition to meeting the performance standards set out in paragraph 37, ship handling simulation equipment should:

- .1 provide a realistic visual scenario as seen from the bridge by day and by night with variable visibility throughout a minimum horizontal field of view available to the trainee in viewing sectors appropriate to the shiphandling and manoeuvring training tasks and objectives** ; and
- .2 realistically simulate 'own ship' dynamics in restricted waterways, including shallow water and bank effects.

* See:

- .1 Resolution A.224(VII) - Performance standards for echo-sounding equipment
- .2 Resolution A.282(VIII) - Recommendation on the installation and use of manoeuvring lights
- .3 Resolution A.342(IX) - Recommendation on performance standards for automatic pilots
- .4 Resolution A.422(XI) - Performance standards for automatic radar plotting aids (ARPA)
- .5 Resolution A.424(XI) - Performance standards for gyro-compasses
- .6 Resolution A.477(XII) - Performance standards for radar equipment
- .7 Resolution A.478(XII) - Performance standards for devices to indicate speed and distance
- .8 Resolution A.526(13) - Performance standards for rate-of-turn indicators
- .9 Resolution A.529(13) - Accuracy standards for navigation
- .10 Resolution A.574(14) - Recommendation on general requirements for electronic navigational aids
- .11 Resolution A.575(14) - Unification of performance standards for navigational equipment
- .12 Resolution A.665(16) - Performance standards for radio direction-finding systems
- .13 Resolution A.694(17) - General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids

** IMO Model Course 1.22 - Ship Simulator and Bridge Teamwork may be of assistance in the preparation of courses.

39 Manned scale models are used to provide shiphandling and manoeuvring simulation, in addition to the performance standards set out in paragraphs 37.3 and 38.2, such equipment should:

- .1 incorporate scaling factors which present accurately the dimensions, areas, volume and displacement, speed, time and rate of turn of a real ship; and
- .2 incorporate controls for the rudder and engines to the correct time scale.

Cargo handling and stowage simulation

40 Cargo handling simulation equipment should be capable of simulating cargo handling and control equipment which meets all applicable performance standards adopted by the Organization,^{*} and incorporate facilities to:

- .1 create an effective operational environment, including a cargo-control station with such instrumentation as may be appropriate to the particular type of cargo system modelled;
- .2 model loading and unloading functions and stability and stress data appropriate to the cargo handling tasks to be carried out and the skills to be assessed; and
- .3 simulate loading, unloading, ballasting and deballasting operations and appropriate associated calculations for stability, trim, list, longitudinal strength, torsional stress and damage stability.^{**}

GMDSS communication simulation

41 GMDSS communication simulation equipment should be capable of simulating GMDSS communication equipment which meets all applicable performance standards adopted by the Organization^{***}, and incorporate facilities to:

* No standards have as yet been adopted by the Organization.

** IMO Model Course 2.06 - Cargo and Ballast Handling Simulator may be of assistance in the preparation of courses.

*** See:

- .1 Resolution A.421(XI) concerning operational standards for radiotelephone alarm signal generators (see also resolution A.663(16) and A.698(17))
- .2 Resolution A.700(17) - Performance standards for narrow-band direct-printing telegraph equipment for the reception of navigational and meteorological warnings and urgent information (MSI) by HF
- .3 Resolution A.609(15) - Performance standards for shipborne VHF radio installations capable of voice communication and digital selective calling
- .4 Resolution A.610(15) - Performance standards for shipborne MF radio installations capable of voice communication and digital selective calling
- .5 Resolution A.612(15) - Performance standards for float-free VHF emergency position-indicating radio beacons
- .6 Resolution A.613(15) - Performance standards for shipborne MF/HF radio installations capable of voice communication, narrow-band direct printing and digital selective calling
- .7 Resolution A.661(16) - Performance standards for float-free satellite emergency position-indicating radio beacons operating through the geostationary INMARSAT satellite system on 1.6 GHz
- .8 Resolution A.662(16) - Performance standards for float-free release and activation arrangements for emergency radio equipment
- .9 Resolution A.663(16) - Performance standards for INMARSAT Standard-C ship earth stations capable of transmitting and receiving direct-printing communications and resolution A.570(14) - Type approval of ship earth stations.
- .10 Resolution A.664(16) - Performance standards for enhanced group call equipment

(continued)

- .1 simulate the operation of VHF, VHF-DSC, NAVTEX, EPIRB and watch receiver equipment as required for the Restricted Operators Certificate (ROC);
- .2 simulate the operation of INMARSAT-A, B and C ship earth stations, MF/HF NBDP, MF/HF-DSC, VHF, VHF-DSC, NAVTEX, EPIRB and watch receiver equipment as required for the General Operator's Certificate (GOC);
- .3 provide voice communication with background noise;
- .4 provide a printed text communication facility; and
- .5 create a real-time operating environment, consisting of an integrated system, incorporating at least one instructor/assessor station and at least two GMDSS ship or shore stations.

Main and auxiliary machinery operation simulation

42 Engine-room simulation equipment should be capable of simulating a main and auxiliary machinery system and incorporate facilities to:

- .1 create a real-time environment for seagoing and harbour operations with communication devices and simulation of appropriate main and auxiliary propulsion machinery equipment and control panels;
- .2 simulate relevant sub-systems that should include but not be restricted to boiler, steering gear, electrical power general and distribution systems including emergency power supplies and fuel, cooling water, refrigeration, bilge and ballast systems;
- .3 monitor and evaluate engine performance and remote sensing systems;
- .4 simulate machinery malfunctions;
- .5 allow for the variable external conditions to be changed so as to influence the simulated operations: weather, ship's draught, sea water and air temperatures;

(continued)

- .11 Resolution A.694(17) - General requirements for shipborne radio equipment forming part of the GMDSS and for electronic navigational aids
- .12 Resolution A.696(17) - Type approval of satellite emergency position-indicating radio beacons (EPIRBs) operating in the COSPAS-SARSAT system
- .13 Resolution A.697(17) - Performance standards for survival craft radar transponders for use in search and rescue operations
- .14 Resolution A.698(17) - Performance standards for ship earth stations capable of two-way communications and resolution A.570(14) - Type approval of ship earth stations
- .15 Resolution A.699(17) - System performance standard for the promulgation and co-ordination of maritime safety information using HF NBDP
- .16 Resolution A.700(17) - Performance standards for narrow-band direct-printing telegraph equipment for the reception of navigational and meteorological warnings and urgent information to ships (MSI) by HF
- .17 Resolution A.763(18) - Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating on 406 MHz.

- .6 allow for instructor controlled external conditions to be changed: deck steam, accommodation steam, deck air, ice conditions, deck cranes, heavy power, bow thrust, ship load;
- .7 allow for instructor controlled simulator dynamics to be changed: emergency run, process responses, ship responses; and
- .8 provide a facility to isolate certain processes, such as speed, electrical system, diesel oil system, lubricating oil system, heavy oil system, seawater system, steam system, exhaust boiler and turbo generator for performing specific training tasks.*

Section B-I/13

Guidance regarding the conduct of trials

(No provisions)

Section B-I/14

Guidance regarding responsibilities of companies and recommended responsibilities of masters and crew members

Companies

1 Companies should provide ship specific introductory programmes aimed at assisting newly employed seafarers to familiarize themselves with all procedures and equipment relating to their areas of responsibility.

Master

2 The master should take all steps necessary to implement any company instructions issued in accordance with section A-I/14. Such steps should include:

- .1 identifying all seafarers who are newly employed on board the ship before they are assigned to any duties;
- .2 providing the opportunity for all newly arrived seafarers to:
 - .2.1 visit the spaces in which their primary duties will be performed,
 - .2.2 get acquainted with the location, controls and display features of equipment they will be operating or using,

*IMO Model Course 2.07 - Engine Room Simulator may be of assistance in the preparation of courses.

- .2.3 activate the equipment when possible and perform functions using the controls on the equipment, and
- .2.4 observe and ask questions of someone who is already familiar with the equipment, procedures and other arrangements, and who can communicate information in a language which the seafarer understands; and
- .3 providing for a suitable period of supervision when there is any doubt that a newly employed seafarer is familiar with the shipboard equipment, operating procedures and other arrangements needed for the proper performance of his or her duties.

Crew members

3 Seafarers who are newly assigned to a ship should take full advantage of every opportunity provided to become familiar with the shipboard equipment, operating procedures and other arrangements needed for the proper performance of their duties. Immediately upon arriving on board for the first time, each seafarer has the responsibility to become acquainted with the ship's working environment, particularly with respect to new or unfamiliar equipment, procedures or arrangements.

4 Seafarers who do not promptly attain the level of familiarity required for performing their duties have the obligation to bring this fact to the attention of their supervisor or to the attention of the crew member designated in accordance with section A-I/14, paragraph 2.2, and to identify any equipment, procedure or arrangement which remains unfamiliar.

Section B-I/15

Guidance regarding transitional provisions

(No provisions)

CHAPTER II

GUIDANCE REGARDING THE MASTER AND THE DECK DEPARTMENT

Section B-II/1

Guidance regarding the certification of officers in charge of a navigational watch on ships of 500 gross tonnage or more

Training

1 Every candidate for certification as officer in charge of a navigational watch should have completed a planned and structured programme of training designed to assist a prospective officer to achieve the standard of competence in accordance with table A-II/1.

2 The structure of the programme of training should be set out in a training plan which clearly expresses for all parties involved the objectives of each stage of training on board and ashore. It is important that the prospective officer, tutors, ships' staff and company personnel are clear about the competences which are to be achieved at the end of the programme and how they are to be achieved through a combination of education, training and practical experience on board and ashore.

3 The mandatory periods of seagoing service are of prime importance in learning the job of being a ship's officer and in achieving the overall standard of competence required. Properly planned and structured, the periods of seagoing service will enable prospective officers to acquire and practise skills and will offer opportunities for competences achieved to be demonstrated and assessed.

4 Where the seagoing service forms part of an approved training programme, the following principles should be observed:

- .1 The programme of on-board training should be an integral part of the overall training plan.
- .2 The programme of on-board training should be managed and co-ordinated by the company which manages the ship on which the seagoing service is to be performed.
- .3 The prospective officer should be provided with a training record book* to enable a comprehensive record of practical training and experience at sea to be maintained. The training record book should be laid out in such a way that it can provide detailed information about the tasks and duties which should be undertaken and the progress towards their completion. Duly completed, the record book will provide unique evidence that a structured programme of on-board training has been completed which can be taken into account in the process of evaluating competence for the issue of a certificate.

*IMO Model Course 7.03 - Officer in Charge of a Navigational Watch - and a similar document produced by the International Shipping Federation may be of assistance in the preparation of training record books.

- .4 At all times, the prospective officer should be aware of two identifiable individuals who are immediately responsible for the management of the programme of on-board training. The first of these is a qualified seagoing officer, referred to as the shipboard training officer who, under the authority of the master, should organise and supervise the programme of training for the duration of each voyage. The second should be a person nominated by the company, referred to as the company training officer, who should have an overall responsibility for the training programme and for co-ordination with colleges and training institutions.
- .5 The company should ensure that appropriate periods are set aside for completion of the programme of on-board training within the normal operational requirements of the ship.

ROLES AND RESPONSIBILITIES

5 The following section summarises the roles and responsibilities of those individuals involved in organizing and conducting on-board training:

- .1 The company training officer should be responsible for:
 - .1.1 overall administration of the programme of training,
 - .1.2 monitoring the progress of the prospective officer throughout, and
 - .1.3 issuing guidance as required and ensuring that all concerned with the training programme play their parts.
- .2 The shipboard training officer should be responsible for:
 - .2.1 organizing the programme of practical training at sea,
 - .2.2 ensuring in a supervisory capacity that the training record book is properly maintained and that all other requirements are fulfilled, and
 - .2.3 making sure, so far as is practicable, that the time the prospective officer spends on board is as useful as possible in terms of training and experience, and is consistent with the objectives of the training programme, the progress of training and the operational constraints of the ship.
- .3 The master's responsibilities should be to:
 - .3.1 provide the link between the shipboard training officer and the company training officer ashore,
 - .3.2 fulfil the role of continuity if the shipboard training officer is relieved during the voyage, and
 - .3.3 ensure that all concerned are effectively carrying out the on-board training programme.

- .4 The prospective officer's responsibilities should be to:
 - .4.1 follow diligently the programme of training as laid down,
 - .4.2 make the most of the opportunities presented, be they in or outside working hours, and
 - .4.3 keep the training record book up to date and ensure that it is available at all times for scrutiny.

INDUCTION

6 At the beginning of the programme and at the start of each voyage on a different ship, prospective officers should be given full information and guidance as to what is expected of them and how the training programme is to be organized. Induction presents the opportunity to brief prospective officers about important aspects of the tasks they will be undertaking, with particular regard to safe working practices and protection of the marine environment.

SHIPBOARD PROGRAMME OF TRAINING

7 The training record book should contain, amongst other things, a number of training tasks or duties which should be undertaken as part of the approved programme of on-board training. Such tasks and duties should relate to at least the following areas:

- .1 steering systems;
- .2 general seamanship;
- .3 mooring, anchoring and port operations;
- .4 life-saving and fire-fighting appliances;
- .5 systems and equipment;
- .6 cargo work;
- .7 bridge work and watchkeeping; and
- .8 engine-room familiarization.

8 It is extremely important that the prospective officer is given adequate opportunity for supervised bridge watchkeeping experience, particularly in the later stages of the on-board training programme.

9 The performance of the prospective officers in each of the tasks and duties itemized in the training record book should be initialled by a qualified officer when, in the opinion of the officer concerned, a prospective officer has achieved a satisfactory standard of proficiency. It is important to appreciate that a prospective officer may need to demonstrate ability on several occasions before a qualified officer is confident that a satisfactory standard has been achieved.

MONITORING AND REVIEWING

10 Guidance and reviewing are essential to ensure that prospective officers are fully aware of the progress they are making and to enable them to join in decisions about their future programme. To be effective, reviews should be linked to information gained through the training record book and other sources as appropriate. The training record book should be scrutinized and endorsed formally by the master and the shipboard training officer at the beginning, during and at the end of each voyage. The training record book should also be examined and endorsed by the company training officer between voyages.

ASSESSMENT OF ABILITIES AND SKILLS IN NAVIGATIONAL WATCHKEEPING

11 A candidate for certification who is required to have received special training and assessment of abilities and skills in navigational watchkeeping duties should be required to provide evidence, through demonstration either on a simulator or on board ship as part of an approved programme of shipboard training, that the skills and ability to perform as officer in charge of a navigational watch in at least the following areas have been acquired, namely to:

- .1 prepare for and conduct a passage, including:
 - .1.1 interpreting and applying information obtained from charts,
 - .1.2 fixing position in coastal waters,
 - .1.3 applying basic information obtained from tide tables and other navigational publications,
 - .1.4 checking and operating bridge equipment,
 - .1.5 checking magnetic and gyro-compasses,
 - .1.6 assessing available meteorological information,
 - .1.7 using celestial bodies to fix position,
 - .1.8 determining the compass error by celestial and terrestrial means, and
 - .1.9 performing calculations for sailings of up to 24 hours;
- .2 operate and apply information obtained from electronic navigation systems;
- .3 operate radar and ARPA and apply radar information for navigation and collision avoidance;
- .4 operate propulsion and steering systems to control heading and speed;
- .5 implement navigational watch routines and procedures;
- .6 implement the manoeuvres required for rescue of persons overboard;
- .7 initiate action to be taken in the event of an imminent emergency situation (e.g. fire, collision, stranding) and action in the immediate aftermath of an emergency;
- .8 initiate action to be taken in event of malfunction or failure of major items of equipment or plant (e.g. steering gear, power, navigation systems);

- .9 conduct radiocommunications and visual and sound signalling in normal and emergency situations; and
 - .10 monitor and operate safety and alarm systems including internal communications.
- 12 Assessment of abilities and skills in navigational watchkeeping should:
- .1 be made against the criteria for evaluating competence for the function of navigation set out in table A-II/1;
 - .2 ensure that the candidate performs navigational watchkeeping duties in accordance with the Principles to be observed in keeping a safe navigational watch (section A-VIII/2, part 3-1) and the Guidance on keeping a navigational watch (section B-VIII/2, part 3-1).

EVALUATION OF COMPETENCE

13 The standard of competence to be achieved for certification as officer in charge of a navigational watch is set out in table A-II/1. The standard specifies the knowledge and skill required and the application of that knowledge and skill to the standard of performance required on board ship.

14 Scope of knowledge is implicit in the concept of competence. Assessment of competence should, therefore, encompass more than the immediate technical requirements of the job, the skills and tasks to be performed, and should reflect the broader aspects needed to meet the full expectations of competent performance as a ships' officer. This includes relevant knowledge, theory, principles and cognitive skills which, to varying degrees, underpin all levels of competence. It also encompasses proficiency in what to do, how and when to do it, and why it should be done. Properly applied, this will help to ensure that a candidate can:

- .1 work competently in different ships and across a range of circumstances;
- .2 anticipate, prepare for and deal with contingencies; and
- .3 adapt to new and changing requirements.

15 The criteria for evaluating competence (column 4 of table A-II/1) identify, primarily in outcome terms, the essential aspects of competent performance. They are expressed so that assessment of a candidate's performance can be made against them and should be adequately documented in the training record book.

16 Evaluation of competence is the process of:

- .1 collecting sufficient valid and reliable evidence about the candidate's knowledge, understanding and proficiency to accomplish the tasks, duties and responsibilities listed in column 1 of table A-II/1; and
- .2 judging that evidence against the criteria specified in the standard.

17 The arrangements for evaluating competence should be designed to take account of different methods of assessment which can provide different types of evidence about candidates' competence, e.g.:

- .1 direct observation of work activities (including seagoing service);
- .2 skills/proficiency/competency tests;
- .3 projects and assignments;
- .4 evidence from previous experience; and
- .5 written, oral and computer-based questioning techniques.*

18 One or more of the first four methods listed should almost invariably be used to provide evidence of ability, in addition to appropriate questioning techniques to provide evidence of supporting knowledge and understanding.

Section B-II/2

Guidance regarding the certification of masters and chief officers on ships of 500 gross tonnage or more

(See section B-II/1 for guidance.)

Section B-II/3

Guidance regarding the certification of officers in charge of a navigational watch and of masters on ships of less than 500 gross tonnage

(See section B-II/1 for guidance.)

Section B-II/4

Guidance regarding ratings forming part of a navigational watch

In addition to the requirements stated in table A-II/4 of this Code, Parties are encouraged for safety reasons to include the following subjects in the training of ratings forming part of a navigational watch:

- .1 a basic knowledge of the International Regulations for Preventing Collisions at Sea;
- .2 rigging a pilot ladder;
- .3 an understanding of wheel orders given by pilots in English;

*IMO Model Course 3.12 - Examination and Certification of Seafarers may be of assistance in the preparation of courses.

- .4 training for proficiency in survival craft and rescue boats;
- .5 support duties when berthing and unberthing and during towing operations;
- .6 a basic knowledge of anchoring;
- .7 a basic knowledge of dangerous cargoes;
- .8 a basic knowledge of stowage procedures and arrangements for bringing stores on board;
and
- .9 a basic knowledge of deck maintenance and tools used on deck.

CHAPTER III

GUIDANCE REGARDING THE ENGINE DEPARTMENT

Section B-III/1

Guidance regarding the certification of officers in charge of an engineering watch in a manned engine-room or as designated duty engineers in a periodically unmanned engine-room

- 1 In table A-III/1, column 1, top block, the tools referred to should include hand tools, common measuring equipment, centre lathes, drilling machines, welding equipment and milling machines as appropriate.
- 2 Training in workshop skills ashore can be carried out in a training institution or approved workshop.
- 3 On-board training should be adequately documented in the training record book by qualified assessors.

Section B-III/2

Guidance regarding the certification of chief engineer officers and second engineer officers of ships powered by main propulsion machinery of 3,000 kW propulsion power or more

(No provisions)

Section B-III/3

Guidance regarding the 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

(No provisions)

Section B-III/4

Guidance regarding the training and certification of ratings forming part of a watch in a manned engine-room or designated to perform duties in a periodically unmanned engine-room

In addition to the requirements stated in section A-III/4 of this Code, Parties are encouraged for safety reasons to include the following items in the training of ratings forming part of an engineering watch:

- .1 a basic knowledge of routine pumping operations, such as bilge, ballast and cargo pumping systems;
- .2 a basic knowledge of electrical installations and the associated dangers;
- .3 a basic knowledge of maintenance and repair of machinery and tools used in the engine-room; and
- .4 a basic knowledge of stowage and arrangements for bringing stores on board.

CHAPTER IV

GUIDANCE REGARDING RADIOCOMMUNICATION AND RADIO PERSONNEL

Section B-IV/1

Guidance regarding the application of chapter IV

(No provisions)

Section B-IV/2

Guidance regarding training and certification of GMDSS radio personnel

TRAINING RELATED TO THE FIRST-CLASS RADIOELECTRONIC CERTIFICATE

General

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

2 The training should be relevant to the provisions of the STCW Convention, the provisions of the Radio Regulations annexed to the International Telecommunication Convention (Radio Regulations) and the provisions of the International Convention for the Safety of Life at Sea (SOLAS) Convention, currently in force, with particular attention given to provisions for the Global Maritime Distress and

Safety System (GMDSS). In developing training requirements, account should be taken of at least the knowledge and training given in paragraphs 3 to 14 hereunder.*

Theory

3 Knowledge of the general principles and basic factors necessary for safe and efficient use of all sub-systems and equipment required in the GMDSS, sufficient to support the practical training provisions given in paragraph 13.

4 Knowledge of the use, operation and service areas of GMDSS sub-systems, including satellite system characteristics, navigational and meteorological warning systems and selection of appropriate communication circuits.

5 Knowledge of the principles of electricity and the theory of radio and electronics sufficient to meet the provisions given in paragraphs 6 to 10 below.

6 Theoretical knowledge of GMDSS radiocommunication equipment, including narrow-band direct-printing telegraphy and radiotelephone transmitters and receivers, digital selective calling equipment, ship earth stations, emergency position-indicating radiobeacons (EPIRBs), marine antenna systems, radio equipment for survival craft together with all auxiliary items, including power supplies, as well as general knowledge of the principles of other equipment generally used for radionavigation, with particular reference to maintaining the equipment in service.

7 Knowledge of factors that affect system reliability, availability, maintenance procedures and proper use of test equipment.

8 Knowledge of microprocessors and fault diagnosis in systems using microprocessors.

9 Knowledge of control systems in the GMDSS radio equipment including testing and analysis.

10 Knowledge of the use of computer software for the GMDSS radio equipment and methods for correcting faults caused by loss of software control of the equipment.

Regulations and documentation

11 Knowledge of:

.1 the SOLAS Convention and the Radio Regulations with particular emphasis on:

.1.1 distress, urgency and safety radiocommunications,

.1.2 avoiding harmful interference, particularly with distress and safety traffic, and

.1.3 prevention of unauthorized transmissions;

*IMO Model Course [.....] related to the First-Class Radioelectronic Certificate (being developed) may be of assistance in the preparation of courses.

- .2 other documents relating to operational and communication procedures for distress, safety and public correspondence services, including charges, navigational warnings, and weather broadcasts in the Maritime Mobile Service and the Maritime Mobile Satellite Service; and
- .3 use of the International Code of Signals and the Standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communication Phrases.

Watchkeeping and procedures

12 Knowledge of and training in:

- .1 communication procedures and discipline to prevent harmful interference in GMDSS sub-systems;
- .2 procedures for using propagation prediction information to establish optimum frequencies for communications;
- .3 radiocommunication watchkeeping relevant to all GMDSS sub-systems, exchange of radiocommunication traffic, particularly concerning distress, urgency and safety procedures and radio records;
- .4 use of the international phonetic alphabet;
- .5 monitoring a distress frequency while simultaneously monitoring or working on at least one other frequency;
- .6 ship reporting systems and procedures;
- .7 radiocommunication procedures of the IMO Merchant Ship Search and Rescue Manual (MERSAR);
- .8 radio medical systems and procedures; and
- .9 causes of false distress alerts and means to avoid them*

Practical

13 Practical training, supported by appropriate laboratory work, should be given in:

- .1 correct and efficient operation of all GMDSS sub-systems and equipment under normal propagation conditions and under typical interference conditions;
- .2 safe operation of all the GMDSS communication equipment and ancillary devices, including safety precautions;

*See COM/Circ.127 - Guidance for avoiding false distress alerts

- .3 adequate and accurate keyboard skills for the satisfactory exchange of communications;
- .4 operational techniques for:
 - .4.1 receiver and transmitter adjustment for the appropriate mode of operation, including digital selective calling and direct-printing telegraphy,
 - .4.2 antenna adjustment and re-alignment, as appropriate,
 - .4.3 use of radio life-saving appliances, and
 - .4.4 use of emergency position-indicating radio beacons (EPIRBs);
- .5 antenna rigging, repair and maintenance, as appropriate;
- .6 reading and understanding pictorial, logic and circuit diagrams;
- .7 use and care of those tools and test instruments necessary to carry out at-sea electronic maintenance;
- .8 manual soldering and desoldering techniques, including those involving semiconductor devices and modern circuits and the ability to distinguish whether the circuit is suitable to be manually soldered or desoldered;
- .9 tracing and repair of faults to component level where practicable, and to board/module level in other cases;
- .10 recognition and correction of conditions contributing to the fault occurring;
- .11 maintenance procedures, both preventive and corrective for all GMDSS communication equipment and radionavigation equipment; and
- .12 methods of alleviating electrical and electromagnetic interference such as bonding, shielding and bypassing.

Miscellaneous

- 14 Knowledge of and/or training in:
 - .1 the English language, both written and spoken, for the satisfactory exchange of communications relevant to the safety of life at sea;
 - .2 world geography, especially the principal shipping routes, services of rescue co-ordination centres (RCCs) and related communication routes;
 - .3 survival at sea, the operation of lifeboats, rescue boats, liferafts, buoyant apparatus and their equipment, with special reference to radio life-saving appliances;
 - .4 fire prevention and fire-fighting, with particular reference to the radio installation;

- .5 preventive measures for the safety of ship and personnel in connection with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards;
- .6 first aid, including heart-respiration revival techniques; and
- .7 co-ordinated universal time (UTC), global time zones and the international date line.

TRAINING RELATED TO THE SECOND-CLASS RADIOELECTRONIC CERTIFICATE

General

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

16 The training should be relevant to the provisions of the STCW Convention, and the SOLAS Convention currently in force, with particular attention given to provisions for the Global Maritime Distress and Safety System (GMDSS). In developing training requirements, account should be taken of at least the knowledge and training given in paragraphs 17 to 28 hereunder.*

Theory

17 Knowledge of the general principles and basic factors necessary for safe and efficient use of all sub-systems and equipment required in the GMDSS, sufficient to support the practical training provisions given in paragraph 27 below.

18 Knowledge of the use, operation and service areas of GMDSS sub-systems, including satellite system characteristics, navigational and meteorological warning systems and selection of appropriate communication circuits.

19 Knowledge of the principles of electricity and the theory of radio and electronics sufficient to meet the provisions given in paragraphs 20 to 24 below.

20 General theoretical knowledge of GMDSS radiocommunication equipment, including narrow-band direct-printing telegraph and radiotelephone transmitters and receivers, digital selective calling equipment, ship earth stations, emergency position-indicating radiobeacons (EPIRBs), marine antenna systems, radio equipment for survival craft together with all auxiliary items, including power supplies, as well as general knowledge of other equipment generally used for radionavigation, with particular reference to maintaining the equipment in service.

*IMO Model Course [.....] related to the Second-Class Radioelectronic Certificate (being developed) may be of assistance in the preparation of courses.

- 21 General knowledge of factors that affect system reliability, availability, maintenance procedures and proper use of test equipment.
- 22 General knowledge of microprocessors and fault diagnosis in systems using microprocessors.
- 23 General knowledge of control systems in the GMDSS radio equipment including testing and analysis.
- 24 Knowledge of the use of computer software for the GMDSS radio equipment and methods for correcting faults caused by loss of software control of the equipment.

Regulations and documentation

- 25 Knowledge of:
 - .1 the SOLAS Convention and the Radio Regulations with particular emphasis on:
 - .1.1 distress, urgency and safety radiocommunications,
 - .1.2 avoiding harmful interference, particularly with distress and safety traffic, and
 - .1.3 the prevention of unauthorized transmissions;
 - .2 other documents relating to operational and communication procedures for distress, safety and public correspondence services, including charges, navigational warnings, and weather broadcasts in the Maritime Mobile Service and the Maritime Mobile Satellite Service; and
 - .3 the use of the International Code of Signals and the Standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communication Phrases.

Watchkeeping and procedures

- 26 Training should be given in:
 - .1 communication procedures and discipline to prevent harmful interference in GMDSS sub-systems;
 - .2 procedures for using propagation prediction information to establish optimum frequencies for communications;
 - .3 radiocommunication watchkeeping relevant to all GMDSS sub-systems, exchange of radiocommunication traffic, particularly concerning distress, urgency and safety procedures and radio records;
 - .4 use of the international phonetic alphabet;
 - .5 monitoring a distress frequency while simultaneously monitoring or working on at least one other frequency;

- .6 ship reporting systems and procedures;
- .7 radiocommunication procedures of the IMO Merchant Ship Search and Rescue Manual (MERSAR);
- .8 radio medical systems and procedures; and
- .9 causes of false distress alerts and means to avoid them*

Practical

- 27 Practical training, supported by appropriate laboratory work, should be given in:
- .1 correct and efficient operation of all GMDSS sub-systems and equipment under normal propagation conditions and under typical interference conditions;
 - .2 safe operation of all the GMDSS communication equipment and ancillary devices, including safety precautions;
 - .3 adequate and accurate keyboard skills for the satisfactory exchange of communications;
 - .4 operational techniques for:
 - .4.1 receiver and transmitter adjustment for the appropriate mode of operation, including digital selective calling and direct-printing telegraphy,
 - .4.2 antenna adjustment and re-alignment, as appropriate,
 - .4.3 use of radio life-saving appliances, and
 - .4.4 use of emergency position-indicating radio beacons (EPIRBs);
 - .5 antenna rigging, repair and maintenance, as appropriate;
 - .6 reading and understanding pictorial, logic and module interconnection diagrams;
 - .7 use and care of those tools and test instruments necessary to carry out at-sea electronic maintenance at the level of unit or module replacement;
 - .8 basic manual soldering and desoldering techniques and their limitations;
 - .9 tracing and repair of faults to board/module level;

*See COM/Circ.127 - Guidelines for avoiding false distress alerts

- .10 recognition and correction of conditions contributing to the fault occurring;
- .11 basic maintenance procedures, both preventive and corrective, for all the GMDSS communication equipment and radionavigation equipment; and
- .12 methods of alleviating electrical and electromagnetic interference such as bonding, shielding and bypassing.

Miscellaneous

- 28 Knowledge of, and/or training in:
- .1 the English language, both written and spoken, for the satisfactory exchange of communications relevant to the safety of life at sea;
 - .2 world geography, especially the principal shipping routes, services of rescue co-ordination centres (RCCs) and related communication routes;
 - .3 survival at sea, the operation of lifeboats, rescue boats, liferafts, buoyant apparatus and their equipment, with special reference to radio life-saving appliances;
 - .4 fire prevention and fire-fighting, with particular reference to the radio installation;
 - .5 preventive measures for the safety of ship and personnel in connection with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards;
 - .6 first aid, including heart-respiration revival techniques; and
 - .7 co-ordinated universal time (UTC), global time zones and international date line.

TRAINING RELATED TO THE GENERAL OPERATOR'S CERTIFICATE

General

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

30 The training should be relevant to the provisions of the STCW Convention, the Radio Regulations and the SOLAS Convention currently in force, with particular attention given to provisions for the Global Maritime Distress and Safety System (GMDSS). In developing training requirements, account should be taken of at least the knowledge and training given in paragraphs 31 to 36 hereunder.*

*IMO Model Course [.....] related to the General Operator's Certificate (being developed) may be of assistance in the preparation of courses.

Theory

31 Knowledge of the general principles and basic factors necessary for safe and efficient use of all sub-systems and equipment required in the GMDSS sufficient to support the practical training provisions given in paragraph 35 below.

32 Knowledge of the use, operation and service areas of GMDSS sub-systems, including satellite system characteristics, navigational and meteorological warning systems and selection of appropriate communication circuits.

Regulations and documentation

33 Knowledge of:

- .1 the SOLAS Convention and the Radio Regulations with particular emphasis on:
 - .1.1 distress, urgency and safety radiocommunications,
 - .1.2 avoiding harmful interference, particularly with distress and safety traffic, and
 - .1.3 prevention of unauthorized transmissions;
- .2 other documents relating to operational and communication procedures for distress, safety and public correspondence services, including charges, navigational warnings, and weather broadcasts in the Maritime Mobile Service and the Maritime Mobile Satellite Service; and
- .3 use of the International Code of Signals and the Standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communication Phrases.

Watchkeeping and procedures

34 Training should be given in:

- .1 communication procedures and discipline to prevent harmful interference in GMDSS sub-systems;
- .2 procedures for using propagation prediction information to establish optimum frequencies for communications;
- .3 radiocommunication watchkeeping relevant to all GMDSS sub-systems, exchange of radiocommunication traffic, particularly concerning distress, urgency and safety procedures and radio records;
- .4 use of the international phonetic alphabet;
- .5 monitoring a distress frequency while simultaneously monitoring or working on at least one other frequency;

- .6 ship reporting systems and procedures;
- .7 radiocommunication procedures of the IMO Merchant Ship Search and Rescue Manual (MERSAR);
- .8 radio medical systems and procedures; and
- .9 causes of false distress alerts and means to avoid them*

Practical

35 Practical training should be given in:

- .1 correct and efficient operation of all GMDSS sub-systems and equipment under normal propagation conditions and under typical interference conditions;
- .2 safe operation of all the GMDSS communications equipment and ancillary devices, including safety precautions;
- .3 accurate and adequate keyboard skills for the satisfactory exchange of communications; and
- .4 operational techniques for:
 - .4.1 receiver and transmitter adjustment for the appropriate mode of operation, including digital selective calling and direct-printing telegraphy,
 - .4.2 antenna adjustment and re-alignment as appropriate,
 - .4.3 use of radio life-saving appliances, and
 - .4.4 use of emergency position-indicating radio beacons (EPIRBs).

Miscellaneous

36 Knowledge of, and/or training in:

- .1 the English language, both written and spoken, for the satisfactory exchange of communications relevant to the safety of life at sea;
- .2 world geography, especially the principal shipping routes, services of rescue co-ordination centres (RCCs) and related communication routes;
- .3 survival at sea, the operation of lifeboats, rescue boats, liferafts, buoyant apparatus and their equipment, with special reference to radio life-saving appliances;

*See COM/Circ.127 - Guidelines for avoiding false distress alerts

- .4 fire prevention and fire-fighting, with particular reference to the radio installation;
- .5 preventive measures for the safety of ship and personnel in connection with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards;
- .6 first aid, including heart-respiration revival techniques; and
- .7 co-ordinated universal time (UTC), global time zones and international date line.

TRAINING RELATED TO THE RESTRICTED OPERATOR'S CERTIFICATE

General

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

38 The training should be relevant to the provisions of the STCW Convention, the Radio Regulations and the SOLAS Convention currently in force, with particular attention given to provisions for the Global Maritime Distress and Safety System (GMDSS). In developing training guidance, account should be taken of at least the knowledge and training given in paragraphs 39 to 44 hereunder.*

Theory

39 Knowledge of the general principles and basic factors, including VHF range limitation and antenna height effect necessary for safe and efficient use of all sub-systems and equipment required in GMDSS in sea area A1, sufficient to support the training given in paragraph 43 below.

40 Knowledge of the use, operation and service areas of GMDSS sea area A1 sub-systems, e.g. navigational and meteorological warning systems and the appropriate communication circuits.

Regulations and documentation

- 41 Knowledge of:
 - .1 those parts of the SOLAS Convention and the Radio Regulations relevant to sea area A1, with particular emphasis on:
 - .1.1 distress, urgency and safety radiocommunications,

*IMO Model Course [.....] related to the Restricted Operator's Certificate (being developed) may be of assistance in the preparation of courses.

- .1.2 avoiding harmful interference, particularly with distress and safety traffic, and
- .1.3 prevention of unauthorized transmissions;
- .2 other documents relating to operational and communication procedures for distress, safety and public correspondence services, including charges, navigational warnings and weather broadcasts in the Maritime Mobile Service in sea area A1; and
- .3 use of the International Code of Signals and the Standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communication Phrases.

Watchkeeping and procedures

42 Training should be given in:

- .1 communication procedures and discipline to prevent harmful interference in GMDSS sub-systems used in sea area A1;
- .2 VHF communication procedures for:
 - .2.1 radiocommunication watchkeeping, exchange of radiocommunication traffic, particularly concerning distress, urgency and safety procedures and radio records,
 - .2.2 monitoring a distress frequency while simultaneously monitoring or working on at least one other frequency, and
 - .2.3 the digital selective calling system;
- .3 use of the international phonetic alphabet;
- .4 ship reporting systems and procedures;
- .5 VHF radiocommunication procedures of the IMO Merchant Ship Search and Rescue Manual (MERSAR);
- .6 radio medical systems and procedures; and
- .7 causes of false distress alerts and means to avoid them*

Practical

43 Practical training should be given in:

- .1 correct and efficient operation of the GMDSS sub-systems and equipment prescribed for ships operating in sea area A1 under normal propagation conditions and under typical

*See COM/Circ.127 - Guidelines for avoiding false distress alerts

- interference conditions;
- .2 safe operation of relevant GMDSS communication equipment and ancillary devices, including safety precautions; and
- .3 operational techniques for use of:
 - .3.1 VHF, including channel, squelch, and mode adjustment, as appropriate,
 - .3.2 radio life-saving appliances,
 - .3.3 emergency position-indicating radio beacons (EPIRBs), and
 - .3.4 NAVTEX receivers.

Miscellaneous

- 44 Knowledge of, and/or training in:
- .1 the English language, both written and spoken, for the satisfactory exchange of communications relevant to the safety of life at sea;
 - .2 services of rescue co-ordination centres (RCCs) and related communication routes;
 - .3 survival at sea, the operation of lifeboats, rescue boats, liferafts, buoyant apparatus and their equipment, with special reference to radio life-saving appliances;
 - .4 fire prevention and fire-fighting, with particular reference to the radio installation;
 - .5 preventive measures for the safety of ship and personnel in connection with hazards related to radio equipment, including electrical, radiation, chemical and mechanical hazards; and
 - .6 first aid, including heart-respiration revival techniques.

TRAINING RELATED TO MAINTENANCE OF GMDSS INSTALLATIONS ON BOARD SHIPS

General

45 Reference is made to the maintenance requirements of SOLAS Convention regulation IV/15, and to IMO resolution A.702(17) on Radio maintenance guidelines for the GMDSS related to sea areas A3 and A4, which includes in its Annex the following provision:

"4.2 The person designated to perform functions for at-sea electronic maintenance should either hold an appropriate certificate as specified by the Radio Regulations, as required, or have equivalent at-sea electronic maintenance qualifications, as may be approved by the Administration, taking into account the recommendations of the Organization on the training of such personnel."

46 The following guidance on equivalent electronic maintenance qualifications is provided for use by Administrations as appropriate.*

47 Training as recommended below, does not qualify any person to be an operator of GMDSS radio equipment who does not hold an appropriate Radio Operator's Certificate.

Maintenance training equivalent to the First-Class Radioelectronic Certificate

48 In determining training equivalent to the elements of the listed First-Class Radioelectronic Certificate:

- .1 the theory content should cover at least the subjects given in paragraphs 3 to 10;
- .2 the practical content should cover at least the subjects given in paragraph 13; and
- .3 the miscellaneous knowledge included should cover at least the subjects given in paragraph 14.

Maintenance training equivalent to the Second-Class Radioelectronic Certificate

49 In determining training equivalent to the maintenance elements of the Second-Class Radioelectronic Certificate:

- .1 the theory content should cover at least the subjects given in paragraphs 17 to 24;
- .2 the practical content should cover at least the subjects given in paragraph 27; and
- .3 the miscellaneous knowledge included should cover at least the subjects given in paragraph 28.

*IMO Model Course [.....] Training in Maintenance of Ships' GMDSS Installations (being developed) may be of assistance in the preparation of courses.

CHAPTER V

GUIDANCE REGARDING SPECIAL TRAINING REQUIREMENTS FOR PERSONNEL ON CERTAIN TYPES OF SHIPS

Section B-V/1

Guidance regarding the training and qualifications of tanker personnel

Oil tanker training

1 The training required by paragraph 2.2 of regulation V/1 in respect of oil tankers 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 on board or ashore. It should be supplemented by practical instruction on board and, where appropriate, in a suitable shore-based installation. All training and instruction should be given by properly qualified and suitably experienced personnel.*

2 As much use as possible should be made of shipboard operation and equipment manuals, films and suitable visual aids, and the opportunity should be taken to introduce discussion of the part to be played by the safety organization on board ship and the role of safety officers and safety committees.

Chemical tanker training

3 The training required by paragraph 2.2 of regulation V/1 in respect of chemical tankers should be divided into two parts, a general part concerning principles involved and a part on the application on board of those principles to ship operations. Any of this training may be given on board or ashore. It should be supplemented by practical instruction on board and, where appropriate, in a suitable shore-based installation. All training and instruction should be given by properly qualified and suitably experienced personnel.**

4 As much use as possible should be made of shipboard operation and equipment manuals, films and suitable visual aids, and the opportunity should be taken to introduce discussion of the part to be played by the safety organization on board ship and the role of safety officers and safety committees.

*The following IMO Model Courses may be of assistance in the preparation of courses:

- .1 IMO Model Course 1.02 - Advanced Training Programme on Oil Tanker Operations
- .2 IMO Model Course 1.11 - MARPOL 73/78 - Annex I
- .3 IMO Model Course 2.06 - Cargo and Ballast Handling Simulator

**The following IMO Model Courses may be of assistance in the preparation of courses:

- .1 IMO Model Course 1.04 - Advanced Training Programme on Chemical Tanker Operations
- .2 IMO Model Course 1.12 - MARPOL 73/78 - Annex II

Liquefied gas tanker training

5 The training required by paragraph 2.2 of regulation V/1 in respect of liquefied gas tankers should be divided into the following two parts:

- .1 supervised instruction, conducted in a shore-based facility or on board 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, so however that Administrations may, in special situations, permit junior officers or ratings to be trained on board liquefied gas tankers on which they are serving, provided that such service is for a limited period, as established by the Administration, and that such crew members do not have duties or responsibilities in connection with cargo or cargo equipment and provided further that they are later trained in accordance with this guidance for any subsequent service; and
- .2 supplementary shipboard training and experience, wherein the principles learned are applied to a particular type of ship and cargo-containment system.

All training and instruction should be given by properly qualified and suitably experienced personnel.*

6 As much use as possible should be made of shipboard operation and equipment manuals, films and suitable visual aids, and the opportunity should be taken to introduce discussion of the part to be played by the safety organization on board ship and the role of safety officers and safety committees.

ON-BOARD TRAINING FOR ALL TANKER PERSONNEL

7 All tanker personnel should undergo training on board and, where appropriate, ashore, which should be given by qualified personnel experienced in the handling and characteristics of oil, chemical or liquefied gas cargoes as appropriate and the safety procedures involved. The training should at least cover the matters set out in paragraphs 9 to 15 below.

Regulations

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

Health hazards and precautions to be taken

9 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.

*IMO Model Course 1.06 - Advanced Training Programme on Liquefied Gas Tanker Operations may be of assistance in the preparation of courses.

Fire prevention and fire-fighting

10 Control of smoking and cooking restrictions; sources of ignition; fire and explosion prevention; methods of fire-fighting; of portable extinguishers and fixed installations.

Pollution Prevention

11 Procedures to be followed to prevent air and water pollution and measures which will be taken in the event of spillage.

Safety equipment and its use

12 The proper use of protective clothing and equipment, resuscitators, escape and rescue equipment.

Emergency procedures

13 Familiarization with the emergency plan procedures.

Cargo equipment and operations

14 A general description of cargo-handling equipment; safe loading and discharge procedures and precautions and safe entry into enclosed spaces.

ON-BOARD TRAINING FOR LIQUEFIED GAS TANKER PERSONNEL

15 Personnel who are required to be trained under regulation V/1 should be provided supplementary shipboard training and experience based on the ship's operation manual. Such training and experience should cover the following systems as applicable:

- .1 the cargo handling system including piping systems; pumps; valves; expansion devices and vapour systems; service requirements and operating characteristics of the cargo handling systems and liquid re-circulation;
- .2 instrumentation systems including cargo level indicators; gas-detection systems; hull and cargo temperature monitoring systems; the various methods of transmitting a signal from a sensor to the monitoring station and automatic shutdown systems;
- .3 boil-off disposal including use as fuel; compressors; heat exchanger; gas piping and ventilation in machinery and manned spaces; principles of dual-fuel boilers, gas turbines, diesel engines; emergency venting and re-liquefaction;
- .4 auxiliary systems including ventilation and inerting; quick-closing, remote control, pneumatic, excess flow, safety relief, and pressure/vacuum valves; steam systems for voids, ballast tanks and condenser; and
- .5 general principles of operating the cargo-handling plant including inerting cargo tanks and void spaces; tank cool-down and loading; operations during loaded and ballasted voyages; discharging and tank stripping; emergency procedures, and pre-planned action

in the event of leaks, fires, collision, stranding, emergency cargo discharge and personnel casualty.

PROOF OF QUALIFICATION

16 The master of every oil, chemical and liquefied gas tanker should ensure that the officer primarily responsible for the cargo possesses an appropriate certificate, issued or endorsed or validated as required by regulation V/1, paragraph 4 and has had adequate recent practical experience on board an appropriate type of tanker to permit that officer to safely perform the duties assigned.

Section B-V/2

Guidance regarding mandatory minimum requirements for the training and qualification of masters, officers, ratings and other personnel on ro-ro passenger ships

(No provisions)

Section B-V/3*

Guidance regarding additional training for masters and chief mates of large ships and ships with unusual manoeuvring characteristics

1 It is important that masters and chief mates should have had relevant experience and training before assuming the duties of master or chief mate of large ships or ships having unusual manoeuvring and handling characteristics significantly different from those in which they have recently served. Such characteristics will generally be found in ships which are of considerable deadweight or length or of special design or of high speed.

2 Prior to their appointment to such a ship, masters and chief mates should:

- .1 be informed of the ship's handling characteristics by the company, particularly in relation to the knowledge, understanding and proficiency listed under ship manoeuvring and handling in column 2 of table A-II/2 - Specification of the minimum standard of competence for masters and chief mates of ships of 500 gross tonnage or more; and
- .2 be made thoroughly familiar with the use of all navigational and manoeuvring aids fitted in the ship concerned, including their capabilities and limitations.

3 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:

- .1 have sufficient and appropriate experience manoeuvring the same ship under supervision or in manoeuvring a ship having similar manoeuvring characteristics; or

*Note there are no corresponding regulations in the Convention or sections in Part A of the Code for sections B-V/3, B-V/4 and B-V/5.

- .2 have attended an approved ship-handling simulator course on an installation capable of simulating the manoeuvring characteristics of such a ship.*

4 The additional training and qualifications of masters and chief mates of dynamically supported and high speed craft should be in accordance with the relevant guidelines of the IMO Code of Safety for Dynamically Supported Craft and the IMO Code of Safety for High Speed Craft (HSC) Code, as appropriate.

Section B-V/4

Guidance regarding training of officers and ratings responsible for cargo handling on ships carrying dangerous and hazardous substances in solid form in bulk.

1 Training should be divided into two parts, a general part on the principles involved and a part on the application of such principles to ship operation. All training and instruction should be given by properly qualified and suitably experienced personnel and cover at least the subjects given in paragraphs 2 to 15 hereunder.

PRINCIPLES

Characteristics and properties

2 The important physical characteristics and chemical properties of dangerous and hazardous substances, sufficient to give a basic understanding of the intrinsic hazards and risks involved.

Classification of materials possessing chemical hazards

3 IMO dangerous goods classes 4-9 and materials hazardous only in bulk (MHB) and the hazards associated with each class.

Health hazards

4 Dangers from skin contact, inhalation, ingestion and radiation.

Conventions, regulations and recommendations

5 General familiarization with the relevant requirements of chapters II-2 and VII of the 1974 SOLAS Convention as amended.

*IMO Model Course 1.22 - Ship Simulator and Bridge Teamwork may be of assistance in the preparation of courses.

6 General use of and familiarization with the Code of Safe Practice for Solid Bulk Cargoes (BC Code) with particular reference to:

- .1 safety of personnel including safety equipment, measuring instruments, their use and practical application and interpretation of results;
- .2 hazards from cargoes which have a tendency to shift; and
- .3 materials possessing chemical hazards.

SHIPBOARD APPLICATION

Class 4.1 - Flammable solids

Class 4.2 - substances liable to spontaneous combustion

Class 4.3 - substances which, in contact with water, emit flammable gases

7 Carriage, stowage and control of temperature to prevent decomposition and possible explosion; stowage categories; general stowage precautions, including those applicable to self-reactive and related substances; segregation requirements to prevent heating and ignition; the emission of poisonous or flammable gases and the formation of explosive mixtures.

Class 5.1 - Oxidizing substances

8 Carriage, stowage and control of temperature to prevent decomposition and possible explosion; stowage categories; general stowage precautions and segregation requirements to ensure separation from combustible material, from acids and heat sources to prevent fire, explosion and the formation of toxic gases.

Class 6.1 - Toxic substances

9 Contamination of foodstuffs, working areas and living accommodation and ventilation.

Class 7 - Radioactives

10 Transport index; types of ores and concentrates; stowage and segregation from persons, undeveloped photographic film and plates and foodstuffs; stowage categories; general stowage requirements; special stowage requirements; segregation requirements and separation distances; segregation from other dangerous goods.

Class 8 - Corrosives

11 Dangers from wetted substances.

Class 9 - Miscellaneous dangerous substances and articles

12 Examples and associated hazards; the hazards of materials hazardous only in bulk (MHB); general and specific stowage precautions; working and transport precautions; segregation requirements.

Safety precautions and emergency procedures

13 Electrical safety in cargo spaces; precautions to be taken for entry into enclosed spaces that may contain oxygen depleted, poisonous or flammable atmospheres; the possible effects of fire in shipments of substances of each class; use of the Emergency Procedures for Ships Carrying Dangerous Goods; emergency plans and procedures to be followed in case of incidents involving dangerous and hazardous substances and the use of individual entries in the Code of Safe Practice for Solid Bulk Cargoes in this respect.

Medical first aid

14 The IMO Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG) and its use and application in association with other guides and medical advice by radio.

Section B-V/5

Guidance regarding training of officers and ratings responsible for cargo handling on ships carrying dangerous and hazardous substances in packaged form.

1 Training should be divided into two parts, a general part on the principles involved and a part on the application of such principles to ship operation. All training and instruction should be given by properly qualified and suitably experienced personnel and cover at least the subjects given in paragraphs 2 to 19 hereunder.

PRINCIPLES

Characteristics and properties

2 The important physical characteristics and chemical properties of dangerous and hazardous substances, sufficient to give a basic understanding of the intrinsic hazards and risks involved.

Classification of dangerous and hazardous substances and materials possessing chemical hazards

3 IMO dangerous goods classes 1-9 and the hazards associated with each class; materials hazardous only in bulk (MHB).

Health hazards

4 Dangers from skin contact, inhalation, ingestion and radiation.

Conventions, regulations and recommendations

5 General familiarization with the relevant requirements of chapters II-2 and VII of the 1974 SOLAS Convention and of Annex III of MARPOL73/78 including its implementation through the IMDG Code.

Use of and familiarization with the International Maritime Dangerous Goods (IMDG) Code

6 General knowledge of the requirements of the IMDG Code concerning declaration, documentation, packing, labelling and placarding; freight container and vehicle packing; portable tanks, tank containers and road tank vehicles, and other transport units used for dangerous substances.

7 Knowledge of identification, marking, labelling, for stowage, securing, separation and segregation in different ship types mentioned in the IMDG Code.

8 Safety of personnel including safety equipment, measuring instruments, their use and practical application and the interpretation of results.

SHIPBOARD APPLICATION

Class 1 - Explosives

9 The 6 hazard divisions and 13 compatibility groups; packagings and magazines used for carriage of explosives; structural serviceability of freight containers and vehicles; stowage provisions, including specific arrangements for on-deck and under deck stowage; segregation from dangerous goods of other classes within class 1 and from non-dangerous goods; transport and stowage on passenger ships; suitability of cargo spaces; security precautions; precautions to be taken during loading and unloading.

Class 2 - Gases (compressed, liquefied, refrigerated liquefied or gases in solution) flammable, non-compressed, non-poisonous and poisonous

10 Types of pressure vessels and portable tanks including relief and closing devices used; stowage categories; general stowage precautions including those for flammable and poisonous gases and gases which are marine pollutants.

Class 3 - Flammable liquids

11 Packagings, tank containers, portable tanks and road tank vehicles; stowage categories, including the specific requirements for plastics receptacles; general stowage precautions including those for marine pollutants; segregation requirements; precautions to be taken when carrying flammable liquids at elevated temperatures.

Class 4.1 - Flammable solids

Class 4.2 - substances liable to spontaneous combustion

Class 4.3 - substances which, in contact with water, emit flammable gases

12 Types of packagings; carriage and stowage under controlled temperatures to prevent decomposition and possible explosion; stowage categories; general stowage precautions, including those applicable to self-reactive and related substances, desensitized explosives and marine pollutants; segregation requirements to prevent heating and ignition, the emission of poisonous or flammable gases and the formation of explosive mixtures.

Class 5.1 - Oxidizing substances
Class 5.2 - Organic peroxides

13 Types of packagings; carriage and stowage under controlled temperatures to prevent decomposition and possible explosion; stowage categories; general stowage precautions, including those applicable to marine pollutants; segregation requirements to ensure separation from combustible material, from acids and heat sources to prevent fire, explosion and the formation of toxic gases; precautions to minimize friction and impact which can initiate decomposition.

Class 6.1 - Toxic substances
Class 6.2 - Infectious substances

14 Types of packagings; stowage categories; general stowage precautions including those applicable to toxic, flammable liquids and marine pollutants; segregation requirements, especially considering that the characteristic common to these substances is their ability to cause death or serious injury to human health; decontamination measures in the event of spillage.

Class 7 - Radioactives

15 Types of packagings; transport index in relation to stowage and segregation; stowage and segregation from persons, undeveloped photographic film and plates and foodstuffs; stowage categories; general stowage requirements; segregation requirements and separation distances; segregation from other dangerous goods.

Class 8 - Corrosives

16 Types of packagings; stowage categories; general stowage precautions, including those applicable to corrosive, flammable liquids and marine pollutants; segregation requirements, especially considering that the characteristic common to these substances is their ability to cause severe damage to living tissue.

Class 9 - Miscellaneous dangerous substances and articles

17 Examples of hazards including marine pollution.

Safety precautions and emergency procedures

18 Electrical safety in cargo spaces; precautions to be taken for entry into enclosed spaces that may contain oxygen depleted, poisonous or flammable atmospheres; the possible effects of spillage or fire in shipments of substances of each class; consideration of events on deck or below deck; use of the IMO Emergency Procedures for Ships Carrying Dangerous Goods; emergency plans and procedures to be followed in case of incidents involving dangerous substances.

Medical first aid

19 The IMO Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG) and its use and application in association with other guides and medical advice by radio.

CHAPTER VI

GUIDANCE REGARDING EMERGENCY, OCCUPATIONAL SAFETY, MEDICAL CARE AND SURVIVAL FUNCTIONS

Section B-VI/1

Guidance regarding familiarization and basic safety training and instruction for all seafarers

Fire prevention and fire-fighting

1 The basic training in fire prevention and fire-fighting required by section A-VI/1 should include at least the theoretical and practical elements itemized in paragraphs 2 to 4 hereunder.*

Theoretical training

2 The theoretical training should cover:

- .1 the three elements of fire and explosion (the fire triangle), fuel; source of ignition; oxygen;
- .2 ignition sources: chemical; biological; physical;
- .3 flammable materials: flammability; ignition point; burning temperature; burning speed; thermal value; lower flammable limit (LFL); upper flammable limit (UFL); flammable range; inerting; static electricity; flashpoint; auto-ignition;
- .4 fire hazard and spread of fire by radiation, convection, and conduction;
- .5 reactivity;
- .6 classification of fires and applicable extinguishing agents;
- .7 main causes of fire on board ships: oil leakage in engine-room; cigarettes; overheating (bearings); galley appliances (stoves, flues, fryers, hotplates, etc.); spontaneous ignition (cargo, wastes, etc.); hot work (welding, cutting, etc.); electrical apparatus (short circuit, non-professional repairs); reaction, self-heating and auto-ignition; arson; static electricity;
- .8 fire prevention;
- .9 fire and smoke detection systems; automatic fire alarms;
- .10 fire-fighting equipment including:

*IMO Model Course 1.20 - Basic Fire-Fighting may be of assistance in the preparation of courses.

- .10.1 fixed installations on board and their locations; fire mains, hydrants; international shore connection; smothering installations, carbon dioxide (CO₂), foam; halogenated hydrocarbons; pressure water spray system in special category spaces, etc.; automatic sprinkler system; emergency fire pump; emergency generator; chemical powder applicants; general outline of required and available mobile apparatus; high pressure fog system; high expansion foam; new developments and equipment;
- .10.2 firefighter's outfit, personal equipment; breathing apparatus; resuscitation apparatus; smoke helmet or mask; fireproof life-line and harness; and their location on board; and
- .10.3 general equipment including fire hoses, nozzles, connections, fire axes; portable fire extinguishers; fire blankets;
- .11 construction and arrangements including escape routes; means for gas freeing tanks; Class A, B and C divisions; inert gas systems;
- .12 ship fire-fighting organization, including general alarm; fire control plans, muster stations and duties of individuals; communications, including ship-shore when in port; personnel safety procedures; periodic shipboard drills; patrol systems.
- .13 practical knowledge of resuscitation methods;
- .14 fire-fighting methods including sounding the alarm; locating and isolating; jettisoning; inhibiting; cooling; smothering; extinguishing; reflash watch; smoke extraction; and
- .15 fire-fighting agents including water, solid jet, spray, fog, flooding; foam, high, medium and low expansion; carbon dioxide (CO₂); halon; aqueous film forming foam (AFFF); dry chemical powder; new developments and equipment.

Practical training

3 The practical training given below should take place in spaces which provide truly realistic training conditions, (e.g. simulated shipboard conditions), and whenever possible and practical should also be carried out in darkness as well as by daylight and should allow the trainees to acquire the ability to:

- .1 use various types of portable fire extinguishers;
- .2 use self-contained breathing apparatus;
- .3 extinguish smaller fires, e.g. electrical fires, oil fires and propane fires;
- .4 extinguish extensive fires with water (jet and spray nozzles);
- .5 extinguish fires with either foam, powder or any other suitable chemical agent;

- .6 enter and pass through, with life-line but without breathing apparatus, a compartment into which high expansion foam has been injected;
- .7 fight fire in smoke-filled enclosed spaces wearing self-contained breathing apparatus;
- .8 extinguish fire with water fog, or any other suitable fire-fighting agent in an accommodation room or simulated engine-room with fire and heavy smoke;
- .9 extinguish an oil fire with fog applicator and spray nozzles; dry chemical powder or foam applicators;
- .10 effect a rescue in a smoke-filled space wearing breathing apparatus.

General

- 4 Trainees should also be made aware of the necessity of maintaining a state of readiness on board.

Elementary first aid*

5 The training in elementary first aid required by regulation VI/1 as part of the basic training should be given at an early stage in vocational training, preferably during pre-sea training, to enable seafarers to take immediate action upon encountering an accident or other medical emergency until the arrival of a person with first aid skills or the person in charge of medical care on board.

Personal safety and social responsibilities

6 Administrations should bear in mind the significance of communication and language skills in maintaining safety of life and property at sea and in preventing marine pollution. Given the international character of the maritime industry, the reliance on voice communications from ship-to-ship and ship-to-shore, the increasing use of multi-national crews, and the concern that crew members should be able to communicate with passengers in an emergency, adoption of a common language for maritime communications would promote safe practice by reducing the risk of human error in communicating essential information.

7 Although not universal, by common practice English is rapidly becoming the standard language of communication for maritime safety purposes, partly as a result of the use of the Standard Marine Navigational Vocabulary, as replaced by the IMO Standard Marine Communication Phrases.

8 Administrations should consider the benefits of ensuring that seafarers have an ability to use at least an elementary English vocabulary, with an emphasis on nautical terms and situations.

*IMO Model Course 1.13 - Medical Emergency - Basic Training may be of assistance in the preparation of courses.

Section B-VI/2

Guidance regarding certification for proficiency in survival craft, rescue boats and fast rescue boats

- 1 Before training is commenced the requirement of medical fitness, particularly regarding eyesight and hearing, should be met by the candidate.
- 2 The training should be relevant to the provisions of the International Convention for the Safety of Life at Sea (SOLAS), as amended.*

Section B-VI/3

Guidance regarding training in advanced fire-fighting

(No provisions)

Section B-VI/4

Guidance regarding requirements in medical first aid and medical care

(No provisions)

*IMO Model Course 1.23 - Proficiency in Survival Craft may be of assistance in the preparation of courses.

CHAPTER VII

GUIDANCE REGARDING ALTERNATIVE CERTIFICATION

Section B-VII/1

Guidance regarding the issue of alternative certificates

(No provisions)

Section B-VII/2

Guidance regarding certification of seafarers

(No provisions)

Section B-VII/3

Guidance regarding principles governing the issue of alternative certificates

(No provisions)

CHAPTER VIII

GUIDANCE REGARDING WATCHKEEPING

Section B-VIII/1

Guidance regarding fitness for duty

Prevention of fatigue

1 In observing the rest period requirements, "overriding operational conditions" should be construed to mean only essential shipboard work which cannot be delayed for safety or environmental reasons or which could not reasonably have been anticipated at the commencement of the voyage.

2 Although there is no universally accepted technical definition of fatigue, everyone involved in ship operations should be alert to the factors which can contribute to fatigue, including, but not limited to those identified by the Organization,* and take them into account when making decisions on ship operations.

3 In applying regulation VIII/1, the following should be taken into account:

- .1 provisions made to prevent fatigue should ensure that excessive or unreasonable overall working hours are not undertaken. In particular, the minimum rest periods specified in Section A-VIII/1 should not be interpreted as implying that all other hours may be devoted to watchkeeping or other duties;

*See IMO resolution A.722(18), paragraphs 2 to 4.4.1.

- .2 that the frequency and length of leave periods, and the granting of compensatory leave, are material factors in preventing fatigue from building up over a period of time;
- .3 the provisions may be varied for ships on short-sea voyages, provided special safety arrangements are put in place; and

4 Administrations should consider the introduction of a requirement that records of hours of work or rest of seafarers should be maintained and that such records are inspected by the Administration at appropriate intervals to ensure compliance with regulations concerning working hours or rest periods.

5 Based on information received as a result of investigating maritime casualties, Administrations should keep their provisions on prevention of fatigue under review.

Section B-VIII/2

Guidance regarding watchkeeping arrangements and principles to be observed

1 The following operational guidance should be taken into account by companies, masters and watchkeeping officers.

PART 1 - GUIDANCE ON CERTIFICATION

(No provisions)

PART 2 - GUIDANCE ON VOYAGE PLANNING

(No provisions)

PART 3 - GUIDANCE ON WATCHKEEPING AT SEA

(No provisions)

PART 3-1 - GUIDANCE ON KEEPING A NAVIGATIONAL WATCH

Introduction

2 Particular guidance may be necessary for special types of ships as well as for ships carrying hazardous, dangerous, toxic or highly flammable cargoes. The master should provide this operational guidance as appropriate.

3 It is essential that officers in charge of the navigational watch appreciate that the efficient performance of their duties is necessary in the interests of the safety of life and property at sea and of preventing pollution of the marine environment.

Bridge resource management

4 Companies should issue guidance on proper bridge procedures, and promote the use of checklists appropriate to each ship taking into account national and international guidance*.

5 Companies should also issue guidance to masters and officers in charge of the navigational watch on each ship concerning the need for continuously reassessing how bridge-watch resources are being allocated and used, based on bridge resource management principles such as the following:

- .1 a sufficient number of qualified individuals should be on watch to ensure all duties can be performed effectively;
- .2 all members of the navigational watch should be appropriately qualified and fit to perform their duties efficiently and effectively or the officer in charge of the navigational watch should take into account any limitation in qualifications or fitness of the individuals available when making navigational and operational decisions;
- .3 duties should be clearly and unambiguously assigned to specific individuals, who should confirm that they understand their responsibilities;
- .4 tasks should be performed according to a clear order of priority;
- .5 no member of the navigational watch should be assigned more duties or more difficult tasks than can be performed effectively;
- .6 individuals should be assigned at all times to locations at which they can most efficiently and effectively perform their duties, and individuals should be reassigned to other locations as circumstances may require;
- .7 members of the navigational watch should not be assigned to different duties, tasks or locations until the officer in charge of the navigational watch is certain that the adjustment can be accomplished efficiently and effectively;
- .8 instruments and equipment considered necessary for effective performance of duties should be readily available to appropriate members of the navigational watch;
- .9 communications among members of the navigational watch should be clear, immediate, reliable, and relevant to the business at hand;
- .10 non-essential activity and distractions should be avoided, suppressed or removed;

*ICS Bridge Procedures Guide (Witherby Marine Publishing, 32/36 Aylesbury Street, London EC1R 0ET, UK) may be of assistance in the preparation of programmes.

- .11 all bridge equipment should be operating properly and if not, the officer in charge of the navigational watch should take into account any malfunction which may exist in making operational decisions;
- .12 all essential information should be collected, processed and interpreted, and made conveniently available to those who require it for the performance of their duties;
- .13 non-essential materials should not be placed on the bridge or any work surface; and
- .14 members of the navigational watch should at all times be prepared to respond efficiently and effectively to changes in circumstances.

PART 3-2 - GUIDANCE ON KEEPING AN ENGINEERING WATCH

6 Particular guidance may be necessary for special types of propulsion systems or ancillary equipment and for ships carrying hazardous, dangerous, toxic or highly flammable materials or other special types of cargo. The chief engineer officer should provide this operational guidance as appropriate.

7 It is essential that officers in charge of the engineering watch appreciate that the efficient performance of engineering watchkeeping duties is necessary in the interest of the safety of life and property at sea and of preventing pollution of the marine environment.

8 The relieving officer, before assuming charge of the engineering watch, should:

- .1 be familiar with the location and use of the equipment provided for the safety of life in a hazardous or toxic environment;
- .2 ascertain that materials for the administration of emergency medical first aid are readily available, particularly those required for the treatment of burns and scalds; and
- .3 when in port, safely anchored or moored, be aware of:
 - .3.1 cargo activities, the status of maintenance and repair functions and all other operations affecting the watch, and
 - .3.2 the auxiliary machinery in use for passenger or crew accommodation services, cargo operations, operational water supplies and exhaust systems.

PART 3-3 - GUIDANCE ON KEEPING A RADIO WATCH

General

9 Among other things, the Radio Regulations require that each ship radio station is licensed, is under the ultimate authority of the master or other person responsible for the ship and is only operated under the control of adequately qualified personnel. The Radio Regulations also require that a distress alert shall only be sent on the authority of the master or other person responsible for the ship.

10 The master should bear in mind that all personnel assigned responsibility for sending a distress alert must be instructed with regard to, be knowledgeable of, and be able to operate properly, all radio equipment on the ship as required by regulation I/14, paragraph 1.4. This should be recorded in the deck or radio log-book.

Watchkeeping

11 In addition to the requirements concerning radiowatchkeeping, the master of every seagoing ship should ensure that:

- .1 the ship's radio station is adequately manned for the purpose of exchanging general communications - in particular public correspondence, taking into account the constraints imposed by the duties of those authorized to operate it; and
- .2 the radio equipment provided on board and, where fitted, the reserve sources of energy, are maintained in an efficient working condition.

12 Necessary instruction and information on use of radio equipment and procedures for distress and safety purposes should be given periodically to all relevant crew members by the person designated in the muster list to have primary responsibility for radiocommunications during distress incidents. This should be recorded in the radio log.

13 The master of every ship not subject to the SOLAS Convention should require that radio watchkeeping is adequately maintained as determined by the Administration, taking into account the Radio Regulations.

Operational

14 Prior to sailing, the radio operator designated as having primary responsibility for radiocommunications during distress incidents should ensure that:

- .1 all distress and safety radio equipment and the reserve source of energy are in an efficient working condition, and that this is recorded in the radio log;
- .2 all documents required by international agreement, notices to ship radio stations and additional documents required by the Administration are available and are corrected in accordance with the latest supplements, and that any discrepancy is reported to the master;
- .3 the radio clock is correctly set against standard time signals;
- .4 antennae are correctly positioned, undamaged and properly connected; and
- .5 to the extent practicable, routine weather and navigational warning messages for the area in which the ship will be navigating are updated together with those for other areas requested by the master, and that such messages are passed to the master.

- 15 On sailing and opening the station, the radio operator on watch should:
- .1 listen on the appropriate distress frequencies for any possible existing distress situation; and
 - .2 send a traffic report (name, position and destination, etc.) to the local coast station and any other appropriate coast station from which general communications may be expected.
- 16 While the station is open, the radio operator on watch should:
- .1 check the radio clock against standard time signals at least once a day;
 - .2 send a traffic report when entering and on leaving the service area of a coast station from which general communications might be expected; and
 - .3 transmit reports to ship reporting systems in accordance with the instructions of the master.
- 17 While at sea, the radio operator designated as having primary responsibility for radiocommunications during distress incidents should ensure the proper functioning of:
- .1 the Digital Selective Calling (DSC) distress and safety radio equipment by means of a test call at least once each week; and
 - .2 the distress and safety radio equipment by means of a test at least once each day but without radiating any signal.

The results of these tests should be recorded in the radio log.

18 The radio operator designated to handle general communications should ensure that an effective watch is maintained on those frequencies on which communications are likely to be exchanged, having regard to the position of the ship in relation to those coast stations and to coast earth stations from which traffic may be expected. When exchanging traffic, radio operators should follow the relevant ITU recommendations.

19 When closing the station on arrival at a port, the radio operator on watch should advise the local coast station and other coast stations with which contact has been maintained of the ship's arrival and of the closing of the station.

20 When closing the radio station the radio operator designated as having primary responsibility for radiocommunications during distress incidents should:

- .1 ensure that transmitting antennae are earthed; and
- .2 check that the reserve sources of energy are sufficiently charged.

Distress alerts and procedures

21 The distress alert or distress call has absolute priority over all other transmissions. All stations which receive such signals are required by the Radio Regulations to immediately cease all transmissions capable of interfering with distress communications.

22 In the case of a distress affecting own ship, the radio operator designated as having primary responsibility for radiocommunications during distress incidents should immediately assume responsibility for following the procedures of the Radio Regulations and relevant ITU-R Recommendations.

23 On receiving a distress alert:

- .1 the radio operator on watch should alert the master and, if appropriate, the radio operator designated as having primary responsibility for radiocommunications during distress incidents; and
- .2 the radio operator designated as having primary responsibility for radiocommunications during distress incidents should evaluate the situation and immediately assume responsibility for following the procedures of the Radio Regulations and relevant ITU-R Recommendations.

Urgency messages

24 In cases of urgency affecting own ship, the radio operator designated as having responsibility for radiocommunications during distress incidents should immediately assume responsibility for following the procedures of the Radio Regulations and relevant ITU-R Recommendations.

25 In cases of communications relating to medical advice, the radio operator designated as having primary responsibility for radiocommunications during distress incidents should follow the procedures of the Radio Regulations and adhere to the conditions as published in the relevant international documentation (see paragraph 14.2) or as specified by the satellite service provider.

26 In cases of communications relating to medical transports, as defined in the Annex 1 to the Protocol additional to the Geneva Conventions of 12 August 1949 relating to the protection of victims of international armed conflicts (Protocol 1), the radio operator designated as having primary responsibility for radiocommunication during distress incidents should follow the procedures of the Radio Regulations.

27 On receiving an urgency message, the radio operator on watch should alert the master and, if appropriate, the radio operator designated as having primary responsibility for radiocommunications during distress incidents.

Safety messages

28 When a safety message is to be transmitted, the master and the radio operator on watch should follow the procedures of the Radio Regulations.

29 On receiving a safety message, the radio operator on watch should note its content and act in accordance with the master's instructions.

30 Bridge-to-bridge communications should be exchanged on VHF channel 13. Bridge-to-bridge communications are described as "Intership Navigation Safety Communications" in the Radio Regulations.

Radio records

31 Additional entries in the radio log should be made in accordance with paragraphs 10, 12, 14, 17 and 33.

32 Unauthorized transmissions and incidents of harmful interference should, if possible, be identified, recorded in the radio log and brought to the attention of the Administration in compliance with the Radio Regulations, together with an appropriate extract from the radio log.

Battery maintenance

33 Batteries providing a source of energy for any part of the radio installation including those associated with uninterrupted power supplies are the responsibility of the radio operator designated as having primary responsibility for radiocommunications during distress incidents and should be:

- .1 tested on-load and off-load daily and, where necessary, brought up to the fully charged condition;
- .2 tested once per week by means of a hydrometer where practicable, or where a hydrometer cannot be used, by a suitable load test; and
- .3 checked once per month for the security of each battery and its connections and the condition of the batteries and their compartment or compartments.

The results of these tests should be recorded in the radio log.

PART 4 - GUIDANCE ON WATCHKEEPING IN PORT

(No provisions)

PART 5 - GUIDANCE ON PREVENTION OF DRUG AND ALCOHOL ABUSE*

34 Drug and alcohol abuse directly affect the fitness and ability of a seafarer to perform watchkeeping duties. Seafarers found to be under the influence of drugs or alcohol should not be permitted to perform watchkeeping duties until they are no longer impaired in their ability to perform those duties.

*See MSC/Circ.595 - Principles and guidelines concerning drug and alcohol abuse programmes and MSC/Circ.634 - Drug use and alcohol abuse.

- 35 Administrations should consider developing national legislation:
- .1 prescribing a maximum of 0.08% blood alcohol level (BAC) during watchkeeping duty as a minimum safety standard on their ships; and
 - .2 prohibiting the consumption of alcohol within 4 hours prior to serving as a member of a watch.

Drug and alcohol abuse screening programme guidelines

36 The Administration should ensure that adequate measures are taken to prevent alcohol and drugs from impairing the ability of watchkeeping personnel, and should establish screening programmes as necessary which:

- .1 identify drug and alcohol abuse;
 - .2 respect the dignity, privacy, confidentiality and fundamental legal rights of the individuals concerned; and
 - .3 take into account relevant international guidelines*.
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*See MSC/Circ.595.