



CONFERENCE OF PARTIES TO THE  
INTERNATIONAL CONVENTION ON  
STANDARDS OF TRAINING,  
CERTIFICATION AND WATCHKEEPING  
FOR SEAFARERS, 1978  
Agenda item 10

STCW/CONF.2/34  
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**ADOPTION OF THE FINAL ACT AND ANY INSTRUMENTS, RESOLUTIONS AND  
RECOMMENDATIONS RESULTING FROM THE WORK OF THE CONFERENCE**

**Attachment 2 to the Final Act of the Conference**

**Resolution 2**

**The Manila Amendments to the Seafarers' Training, Certification  
and Watchkeeping (STCW) Code**

**Text adopted by the Conference**

THE 2010 MANILA CONFERENCE,

HAVING ADOPTED resolution 1 on Adoption of the Manila 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, property and security 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 or will be employed on such ships,

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

HAVING CONSIDERED amendments to the Seafarers' Training, Certification and Watchkeeping (STCW) Code, comprised in 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 annex to the 1978 STCW Convention provides that amendments to part A of the STCW Code shall be adopted, brought into force and take effect in accordance with the provisions of article XII of the Convention concerning the amendment procedure applicable to the annex,

HAVING CONSIDERED amendments to the STCW Code proposed and circulated to the Members of the Organization and to all Parties to the Convention,

1. ADOPTS amendments to the Seafarers' Training, Certification and Watchkeeping (STCW) Code, set out in annex to the present resolution;
2. DETERMINES, in accordance with article XII(1)(a)(vii) of the Convention, that the amendments to part A of the STCW Code shall be deemed to have been accepted on 1 July 2011, unless, prior to that date, more than one third of Parties or Parties the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant shipping of ships of 100 gross register tons or more have notified the Secretary-General that they object to the amendments;
3. INVITES Parties to note that, in accordance with article XII(1)(a)(ix) of the Convention, the amendments to part A of the STCW Code annexed hereto shall enter into force on 1 January 2012 upon being deemed to have been accepted in accordance with paragraph 2 above;
4. RECOMMENDS that the guidance contained in part B of the STCW Code, as amended, should be taken into account by all Parties to the 1978 STCW Convention as from the date of entry into force of the amendments to part A of the STCW Code;
5. REQUESTS the Maritime Safety Committee to keep the STCW Code under review and amend it, as appropriate;
6. ALSO REQUESTS the Secretary-General of the Organization to transmit certified copies of the present resolution and the text of amendments to the STCW Code contained in the annex to all Parties to the Convention;
7. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its annex to all Members of the Organization which are not Parties to the Convention.

\* \* \*

## ANNEX

### THE MANILA AMENDMENTS TO THE SEAFARERS' TRAINING, CERTIFICATION AND WATCHKEEPING (STCW) CODE

1 The part A of the Seafarers' Training, Certification and Watchkeeping (STCW) Code is replaced by the following:

#### “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 “Specification of Minimum Standard 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 6, 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**

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 11 of the Convention while its holder is 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 the 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**

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 11 of the Convention while its holder is 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 the 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**

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 11 of the Convention while its holder is 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 the 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 10, 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.

**ISSUE AND REGISTRATION OF CERTIFICATES**

**Approval of seagoing service**

5 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 practice, under appropriate supervision, those safe and proper seagoing practices, procedures and routines which are relevant to the qualification applied for.

**Approval of training courses**

6 In approving training courses and programmes, Parties should take into account that the relevant IMO Model Courses 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**

7 In the maintenance of the electronic register in accordance with paragraph 15 of regulation I/2, provisions shall be made to allow controlled electronic access to such register or registers to allow Parties and companies to confirm:

- .1 the name of the seafarer to whom such 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 attached thereto.

### **Development of a database for certificate registration**

8 In implementing the requirement in paragraph 14 of regulation I/2 for the maintenance of a register of certificates and endorsements, a standard database is not necessary provided that all the relevant information is recorded and available in accordance with regulation I/2.

9 The following items of information should be recorded and available, either on paper or electronically, in accordance with regulation I/2:

.1 **Status of certificate**

Valid  
Suspended  
Cancelled  
Reported lost  
Destroyed

with a record of changes to status to be kept, including dates of changes.

.2 **Certificate details**

Seafarer's name  
Date of birth  
Nationality  
Gender  
Preferably a photograph  
Relevant document number  
Date of issue  
Date of expiry  
Last revalidation date  
Details of dispensation(s)

**.3 Competency details**

STCW standard of competence (e.g., regulation II/1)

Capacity

Function

Level of responsibility

Endorsements

Limitations

**.4 Medical details**

Date of issue of latest medical certificate relating to the issue or revalidation of the certificate of competency.

**Section A-I/3**

*Principles governing near-coastal voyages*

1 When a Party defines near-coastal voyages, *inter alia*, for the purpose 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, for the issue of certificates valid for service on ships entitled to fly the flag of that Party and engaged on such voyages, account shall be taken of the following factors, bearing in mind the effect on the safety and security of all ships and on the marine environment:

- .1 type of ship and the trade in which it is engaged;
- .2 gross tonnage of the ship and the propulsion power in kilowatts of the main machinery;
- .3 nature and length of the voyages;
- .4 maximum distance from a port of refuge;
- .5 adequacy of the coverage and accuracy of navigational position-fixing devices;
- .6 weather conditions normally prevailing in the near-coastal voyages area;
- .7 provision of shipboard and coastal communication facilities for search and rescue; and
- .8 the availability of shore-based support, regarding especially technical maintenance on board.

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

**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 onboard 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. Onboard 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.

6 Assessment of competency related to security shall be conducted for those seafarers with specific security duties only in case of clear grounds, as provided for in chapter XI/2 of the International Convention for the Safety of Life at Sea (SOLAS). In all other cases, it shall be confined to the verification of the certificates and/or endorsements of the seafarers.

#### **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;
- .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.

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

## **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 shall 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 the paragraphs hereunder.

## **PART 1 – INITIAL COMMUNICATION OF INFORMATION**

2 Within one calendar year of entry into force of regulation I/7, 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 contact details 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/2, 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 attached 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.



## **PART 2 – SUBSEQUENT REPORTS**

- 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. The report of the evaluation shall include the following information:
  - .1 the qualifications and experience of those who conducted the evaluation; (e.g., certificates of competency held, experience as a seafarer and independent evaluator, experience in the field of maritime training and assessment, experience in the administration of certification systems, or any other relevant qualifications/experience);
  - .2 the terms of reference for the independent evaluation and those of the evaluators;
  - .3 a list of training institutions/centres covered by the independent evaluation; and
  - .4 the results of the independent evaluation, including:
    - .1 verification that:
      - .1.1 all applicable provisions of the Convention and STCW Code, including their amendments, are covered by the Party's quality standards system in accordance with section A-I/8, paragraph 3.1; and
      - .1.2 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 defined objectives in accordance with section A-I/8, paragraph 3.2;
    - .2 a brief description of:
      - .2.1 the non-conformities found, if any, during the independent evaluation,
      - .2.2 the corrective measures recommended to address the identified non-conformities, and
      - .2.3 the corrective measures carried out to address the identified non-conformities.

5 Parties shall report the steps taken to implement any subsequent mandatory amendments to the Convention and STCW Code, not previously included in the report on the initial communication of information pursuant to regulation I/7 or any previous report pursuant to regulation I/8. The information shall be included in the next report pursuant to regulation I/8, paragraph 3, following the entry into force of the amendment.

6 The information on the steps taken to implement mandatory amendments to the Convention and STCW Code shall include the following, where applicable:

- .1 a concise explanation of the legal and administrative measures provided and taken to ensure compliance with the amendment;
- .2 a concise summary of any courses, training programmes, examinations and assessments provided to comply with the amendment;
- .3 a concise outline of the procedures followed to authorize, accredit or approve training and examinations, medical fitness and competency assessments required under the amendment;
- .4 a concise outline of any refresher training and upgrading training required to meet the amendments; and
- .5 a comparison between the measures to implement the amendment and existing measures contained in previous reports pursuant to regulation I/7, paragraph 1 and/or regulation I/8, paragraph 2 where applicable.

### **PART 3 – PANEL OF COMPETENT PERSONS**

7 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 evaluate the reports submitted pursuant to regulation I/7 and regulation I/8 and may be called 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.

8 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.

9 When a report is received from any Party under regulation I/8, paragraph 3, the Secretary-General will designate competent persons from the list maintained in accordance with paragraph 7 above, to consider the report and provide their views on whether:

- .1 the report is complete and demonstrates that the Party has carried out an independent evaluation of the knowledge, understanding, skills and competence acquisition and assessment activities, and of the administration of the certification system (including endorsement and revalidation), in accordance with section A-I/8, paragraph 3;
- .2 the report is sufficient to demonstrate that:
  - .2.1 the evaluators were qualified,

- .2.2 the terms of reference were clear enough to ensure that:
    - .2.2.1 all applicable provisions of the Convention and STCW Code, including their amendments, are covered by the Party's quality standards system; and
    - .2.2.2 the implementation of clearly defined objectives in accordance with regulation I/8, paragraph 1 could be verified over the full range of relevant activities,
  - .2.3 the procedures followed during the independent evaluation were appropriate to identify any significant non-conformities in the Party's system of training, assessment of competence, and certification of seafarers, as may be applicable to the Party concerned, and
  - .2.4 the actions being taken to correct any noted non-conformities are timely and appropriate.
- 10 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 five 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.
- 11 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;
  - .3 the report of any steps taken to implement the amendments to the STCW Convention and Code submitted under paragraph 5; and
  - .4 any additional information provided by the Party.

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\* *Corrective actions must be timely and appropriate* means those actions must be focused on the underpinning/root causes of deficiencies and must be arranged to take place in a prescribed time schedule.

## **PART 4 – REPORT TO THE MARITIME SAFETY COMMITTEE**

12 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 7;
- .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.

13 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.

14 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 10 and 11.

### **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 that the levels of knowledge, understanding and skills appropriate to the examinations and assessments required under the Convention are identified. 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, is conducted at intervals of not more than five years in order to verify that:

- .1 all applicable provisions of the Convention and STCW Code, including their amendments, are covered by the quality standards system;
- .2 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;
- .3 the results of each independent evaluation are documented and brought to the attention of those responsible for the area evaluated; and
- .4 timely action is taken to correct deficiencies.

## **Section A-I/9**

### *Medical standards*

1 Parties, when establishing standards of medical fitness for seafarers as required by regulation I/9, shall adhere to the minimum in-service eyesight standards set out in table A-I/9 and take into account the criteria for physical and medical fitness set out in paragraph 2. They should also take into account the guidance given in section B-I/9 of this Code and table B-I/9 regarding assessment of minimum physical abilities.

These standards may, to the extent determined by the Party without prejudice to the safety of the seafarers or the ship, differentiate between those persons seeking to start a career at sea and those seafarers already serving at sea and between different functions on board, bearing in mind the different duties of seafarers. They shall also take into account any impairment or disease that will limit the ability of the seafarer to effectively perform his/her duties during the validity period of the medical certificate.

2 The standards of physical and medical fitness established by the Party shall ensure that seafarers satisfy the following criteria:

- .1 have the physical capability, taking into account paragraph 5 below, to fulfil all the requirements of the basic training as required by section A-VI/1, paragraph 2;
- .2 demonstrate adequate hearing and speech to communicate effectively and detect any audible alarms;
- .3 have no medical condition, disorder or impairment that will prevent the effective and safe conduct of their routine and emergency duties on board during the validity period of the medical certificate;
- .4 are not suffering from any medical condition likely to be aggravated by service at sea or to render the seafarer unfit for such service or to endanger the health and safety of other persons on board; and
- .5 are not taking any medication that has side effects that will impair judgment, balance, or any other requirements for effective and safe performance of routine and emergency duties on board.

3 Medical fitness examinations of seafarers shall be conducted by appropriately qualified and experienced medical practitioners recognized by the Party.

4 Each Party shall establish provisions for recognizing medical practitioners. A register of recognized medical practitioners shall be maintained by the Party and made available to other Parties, companies and seafarers on request.

5 Each Party shall provide guidance for the conduct of medical fitness examinations and issuing of medical certificates, taking into account provisions set out in section B-I/9 of this Code. Each Party shall determine the amount of discretion given to recognized medical practitioners on the application of the medical standards, bearing in mind the different duties of seafarers, except that there shall not be discretion with respect to the minimum eyesight standards for distance vision aided, near/immediate vision and colour vision in table A-I/9 for seafarers in the deck department required to undertake look-out duties. A Party may allow discretion on the

application of these standards with regard to seafarers in the engine department, on the condition that seafarers' combined vision fulfils the requirements set out in table A-I/9.

6 Each Party shall establish processes and procedures to enable seafarers who, after examination, do not meet the medical fitness standards or have had a limitation imposed on their ability to work, in particular with respect to time, field of work or trading area, to have their case reviewed in line with that Party's provisions for appeal.

7 The medical certificate provided for in regulation I/9, paragraph 3 shall include the following information as a minimum:

- .1 Authorizing authority** and the requirements under which the document is issued
- .2 Seafarer information**
  - .2.1 Name: (*Last, first, middle*)
  - .2.2 Date of birth: (*day/month/year*)
  - .2.3 Gender: (*Male/Female*)
  - .2.4 Nationality
- .3 Declaration of the recognized medical practitioner**
  - .3.1 Confirmation that identification documents were checked at the point of examination: *Y/N*
  - .3.2 Hearing meets the standards in section A-I/9: *Y/N*
  - .3.3 Unaided hearing satisfactory? *Y/N*
  - .3.4 Visual acuity meets standards in section A-I/9? *Y/N*
  - .3.5 Colour vision\* meets standards in section A-I/9? *Y/N*
    - .3.5.1 Date of last colour vision test.
  - .3.6 Fit for look-out duties? *Y/N*
  - .3.7 No limitations or restrictions on fitness? *Y/N*  
If "N", specify limitations or restrictions.
  - .3.8 Is the seafarer free from any medical condition likely to be aggravated by service at sea or to render the seafarer unfit for such service or to endanger the health of other persons on board?: *Y/N*
  - .3.9 Date of examination: (*day/month/year*)
  - .3.10 Expiry date of certificate: (*day/month/year*)

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\* Note: Colour vision assessment only needs to be conducted every six years.

**.4 Details of the issuing authority**

.4.1 Official stamp (including name) of the issuing authority

.4.2 Signature of the authorized person

**.5 Seafarer's signature** – *confirming that the seafarer has been informed of the content of the certificate and of the right to a review in accordance with paragraph 6 of section A-I/9*

8 Medical certificates shall be in the official language of the issuing country. If the language used is not English, the text shall include a translation into that language.

*Table A-I/9*  
**Minimum in-service eyesight standards for seafarers**

STCW Convention regulation	Category of seafarer	Distance vision Aided <sup>1</sup>		Near/immediate vision	Colour vision <sup>3</sup>	Visual fields <sup>4</sup>	Night blindness <sup>4</sup>	Diplopia (double vision) <sup>4</sup>
		One eye	Other eye	Both eyes together, aided or unaided				
I/11 II/1 II/2 II/3 II/4 II/5 VII/2	Masters, deck officers and ratings required to undertake look-out duties	0.5 <sup>2</sup>	0.5	Vision required for ship's navigation (e.g., chart and nautical publication reference, use of bridge instrumentation and equipment, and identification of aids to navigation)	See Note 6	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 III/5 III/6 III/7 VII/2	All engineer officers, electro-technical officers, electro-technical ratings and ratings or others forming part of an engine-room watch	0.4 <sup>5</sup>	0.4 (see Note 5)	Vision required to read instruments in close proximity, to operate equipment, and to identify systems/ components as necessary	See Note 7	Sufficient visual fields	Vision required to perform all necessary functions in darkness without compromise	No significant condition evident
I/11 IV/2	GMDSS Radio operators	0.4	0.4	Vision required to read instruments in close proximity, to operate equipment, and to identify systems/ components as necessary	See Note 7	Sufficient visual fields	Vision required to perform all necessary functions in darkness without compromise	No significant condition evident

## Notes:

- 1 Values given in Snellen decimal notation.
- 2 A value of at least 0.7 in one eye is recommended to reduce the risk of undetected underlying eye disease.
- 3 As defined in the *International Recommendations for Colour Vision Requirements for Transport* by the Commission Internationale de l'Eclairage (CIE-143-2001 including any subsequent versions).
- 4 Subject to assessment by a clinical vision specialist where indicated by initial examination findings.
- 5 Engine department personnel shall have a combined eyesight vision of at least 0.4.
- 6 CIE colour vision standard 1 or 2.
- 7 CIE colour vision standard 1, 2 or 3.



## **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/2 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:
  - .1.1 twelve months in total during the preceding five years, or
  - .1.2 three months in total during the preceding six months immediately prior to revalidating; or
- .2 having performed functions considered to be equivalent to the seagoing service required in paragraph 1.1; or
- .3 passing an approved test; or
- .4 successfully completing an approved training course or courses; or
- .5 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, security and the protection of the marine environment and take account of any updating of the standard of competence concerned.

3 Continued professional competence for tankers as required under regulation I/11, paragraph 3 shall be established by:

- .1 approved seagoing service, performing duties appropriate to the tanker certificate or endorsement held, for a period of at least 3 months in total during the preceding 5 years; or

- .2 successfully completing an approved relevant training course or courses.

## **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 the stabilized relative-motion mode and sea- and ground-stabilized 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.

#### *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.

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\* See relevant/appropriate performance standards adopted by the Organization.

**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
  - .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 optimize 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 with 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)

### **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;
  - .1.2 ship-specific watchkeeping, safety, environmental protection, security 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.

3 Companies shall ensure that masters, officers and other personnel assigned specific duties and responsibilities on board their ro-ro passenger ships shall have completed familiarization training to attain the abilities that are appropriate to the capacity to be filled and duties and responsibilities to be taken up, taking into account the guidance given in section B-I/14 of this Code.

### **Section A-I/15**

#### *Transitional provisions*

(No provisions)

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\* The relevant IMO Model Course(s) and resolution MSC.64(67), *Recommendations on new and amended performance standards*, 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 the operational level, the tasks, duties and responsibilities listed in column 1 of table A-II/1;
  - .2 at least hold the 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 the 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/2, part 4-1 – 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.

#### Onboard 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 of a training programme approved as meeting the requirements of this section shall follow an approved programme of onboard 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;

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

- .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.

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\* The relevant IMO Model Course(s) 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
Plan and conduct a passage and determine position	<p><i>Celestial navigation</i></p> <p>Ability to use celestial bodies to determine the ship's position</p> <p><i>Terrestrial and coastal navigation</i></p> <p>Ability to determine the ship's position by use of:</p> <p>.1 landmarks</p> <p>.2 aids to navigation, including lighthouses, beacons and buoys</p> <p>.3 dead reckoning, taking into account winds, tides, currents and estimated speed</p> <p>Thorough knowledge of and ability to use nautical charts, and publications, such as sailing directions, tide tables, notices to mariners, radio navigational warnings and ships' routeing information</p> <p><i>Electronic systems of position fixing and navigation</i></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>using chart catalogues, charts, nautical publications, radio navigational warnings, sextant, azimuth mirror, electronic navigation equipment, echo-sounding equipment, compass</p>	<p>The information obtained from nautical 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>



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	Ability to determine the ship's position by use of electronic navigational aids		Performance checks and tests to navigation systems comply with manufacturer's recommendations and good navigational practice
Plan and conduct a passage and determine position <i>(continued)</i>	<p><i>Echo-sounders</i></p> <p>Ability to operate the equipment and apply the information correctly</p> <p><i>Compass – magnetic and gyro</i></p> <p>Knowledge of the principles of magnetic and gyro-compasses</p> <p>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 system</i></p> <p>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></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>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>

Column 1	Column 2	Column 3	Column 4
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 the content, application and intent of the International Regulations for Preventing Collisions at Sea, 1972, as amended</p> <p>Thorough knowledge of the Principles to be observed in keeping a navigational watch</p> <p>The use of routeing in accordance with the General Provisions on Ships' Routeing</p> <p>The use of information from navigational equipment for maintaining a safe navigational watch</p> <p>Knowledge of blind pilotage techniques</p> <p>The use of reporting in accordance with the General Principles for Ship Reporting Systems and with VTS 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 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 look-out 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, 1972, as amended, 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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain a safe navigational watch (continued)</p>	<p><i>Bridge resource management</i></p> <p>Knowledge of bridge resource management principles, including:</p> <ul style="list-style-type: none"> <li>.1 allocation, assignment, and prioritization of resources</li> <li>.2 effective communication</li> <li>.3 assertiveness and leadership</li> <li>.4 obtaining and maintaining situational awareness</li> <li>.5 consideration of team experience</li> </ul>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved training</li> <li>.2 approved in-service experience</li> <li>.3 approved simulator training</li> </ul>	<p>Resources are allocated and assigned as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Questionable decisions and/or actions result in appropriate challenge and response</p> <p>Effective leadership behaviours are identified</p> <p>Team member(s) share accurate understanding of current and predicted vessel state, navigation path, and external environment</p>
<p>Use of radar and ARPA to maintain safety of navigation</p> <p><i>Note:</i> 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></p> <p>Knowledge of the fundamentals of radar and automatic radar plotting aids (ARPA)</p> <p>Ability to operate and to interpret and analyse information obtained from radar, including the following:</p> <p>Performance, including:</p> <ul style="list-style-type: none"> <li>.1 factors affecting performance and accuracy</li> <li>.2 setting up and maintaining displays</li> <li>.3 detection of misrepresentation of information, false echoes, sea return, etc., racons and SARTs</li> </ul>	<p>Assessment of evidence obtained from approved radar simulator and ARPA simulator 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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Use of radar and ARPA to maintain safety of navigation (<i>continued</i>)</p> <p><i>Note:</i> 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>Use, including:</p> <p>.1 range and bearing; course and speed of other ships; time and distance of closest approach of crossing, meeting overtaking ships</p> <p>.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> <p>.3 application of the International Regulations for Preventing Collisions at Sea, 1972, as amended</p> <p>.4 plotting techniques and relative- and true-motion concepts</p> <p>.5 parallel indexing</p>		<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, 1972, as amended</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, 1972, as amended</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Use of radar and ARPA to maintain safety of navigation (<i>continued</i>)</p> <p><i>Note:</i> 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>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> <ul style="list-style-type: none"> <li>.1 system performance and accuracy, tracking capabilities and limitations, and processing delays</li> <li>.2 use of operational warnings and system tests</li> <li>.3 methods of target acquisition and their limitations</li> <li>.4 true and relative vectors, graphic representation of target information and danger areas</li> <li>.5 deriving and analysing information, critical echoes, exclusion areas and trial manoeuvres</li> </ul>		
<p>Use of ECDIS to maintain the safety of navigation</p> <p><i>Note:</i> Training and assessment in the use of ECDIS is not required for those who serve exclusively on ships not fitted with ECDIS</p> <p>These limitations shall be reflected in the endorsements issued to the seafarer concerned</p>	<p><i>Navigation using ECDIS</i></p> <p>Knowledge of the capability and limitations of ECDIS operations, including:</p> <ul style="list-style-type: none"> <li>.1 a thorough understanding of Electronic Navigational Chart (ENC) data, data accuracy, presentation rules, display options and other chart data formats</li> <li>.2 the dangers of over-reliance</li> <li>.3 familiarity with the functions of ECDIS</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved training ship experience</li> <li>.2 approved ECDIS simulator training</li> </ul>	<p>Monitors information on ECDIS in a manner that contributes to safe navigation</p> <p>Information obtained from ECDIS (including radar overlay and/or radar tracking functions, when fitted) is correctly interpreted and analysed, taking into account the limitations of the equipment, all connected sensors (including radar and AIS where interfaced), and prevailing circumstances and conditions</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>required by performance standards in force</p> <p>Proficiency in operation, interpretation, and analysis of information obtained from ECDIS, including:</p> <ol style="list-style-type: none"> <li>.1 use of functions that are integrated with other navigation systems in various installations, including proper functioning and adjustment to desired settings</li> <li>.2 safe monitoring and adjustment of information, including own position, sea area display, mode and orientation, chart data displayed, route monitoring, user-created information layers, contacts (when interfaced with AIS and/or radar tracking) and radar overlay functions (when interfaced)</li> <li>.3 confirmation of vessel position by alternative means</li> <li>.4 efficient use of settings to ensure conformance to operational procedures, including alarm parameters for anti-grounding, proximity to contacts and special areas, completeness of chart data and chart update status, and backup arrangements</li> <li>.5 adjustment of settings and values to suit the present conditions</li> </ol>		<p>Safety of navigation is maintained through adjustments made to the ship's course and speed through ECDIS-controlled track-keeping functions (when fitted)</p> <p>Communication is clear, concise and acknowledged at all times in a seamanlike manner</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Use of ECDIS to maintain the safety of navigation <i>(continued)</i>	.6 situational awareness while using ECDIS including safe water and proximity of hazards, set and drift, chart data and scale selection, suitability of route, contact detection and management, and integrity of sensors		
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 International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual</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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Use the IMO Standard Marine Communication Phrases and use English in written and oral form	<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, coast stations and VTS centres and to perform the officer's duties also with a multilingual crew, including the ability to use and understand the IMO Standard Marine Communication Phrases (IMO SMCP)</p>	Examination and assessment of evidence obtained from practical instruction	<p>English language nautical publications and messages relevant to the safety of the ship are correctly interpreted or drafted</p> <p>Communications are clear and understood</p>
Transmit and receive information by visual signalling	<p><i>Visual signalling</i></p> <p>Ability to use the International Code of Signals</p> <p>Ability to transmit and receive, by Morse light, distress signal SOS as specified in Annex IV of the International Regulations for Preventing Collisions at Sea, 1972, as amended, and appendix 1 of the International Code of Signals, and visual signalling of single-letter signals as also specified in the International Code of Signals</p>	Assessment of evidence obtained from practical instruction and/or simulation	Communications within the operator's area of responsibility are consistently successful



Column 1	Column 2	Column 3	Column 4
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"> <li>.1 the effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances</li> <li>.2 the effects of wind and current on ship handling</li> <li>.3 manoeuvres and procedures for the rescue of person overboard</li> <li>.4 squat, shallow-water and similar effects</li> <li>.5 proper procedures for anchoring and mooring</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> <li>.4 approved training on a manned scale ship model, where appropriate</li> </ul>	<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 to maintain safety of navigation</p>

**Function: Cargo handling and stowage 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
Monitor the loading, stowage, securing, care during the voyage and the unloading of cargoes	<p><i>Cargo handling, stowage and securing</i></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>Ability to establish and maintain effective communications during loading and unloading</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> <p>Communications are clear, understood and consistently successful</p>
Inspect and report defects and damage to cargo spaces, hatch covers and ballast tanks	<p>Knowledge<sup>*</sup> and ability to explain where to look for damage and defects most commonly encountered due to:</p> <p>.1 loading and unloading operations</p> <p>.2 corrosion</p> <p>.3 severe weather conditions</p> <p>Ability to state which parts of the ship shall be inspected each time in order to cover all parts within a given period of time</p> <p>Identify those elements of the ship structure which are critical to the safety of the ship</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 inspections are carried out in accordance with laid-down procedures, and defects and damage are detected and properly reported</p> <p>Where no defects or damage are detected, the evidence from testing and examination clearly indicates adequate competence in adhering to procedures and ability to distinguish between normal and defective or damaged parts of the ship</p>

\* It should be understood that deck officers need not be qualified in the survey of ships.

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Inspect and report defects and damage to cargo spaces, hatch covers and ballast tanks <i>(continued)</i>	State the causes of corrosion in cargo spaces and ballast tanks and how corrosion can be identified and prevented  Knowledge of procedures on how the inspections shall be carried out  Ability to explain how to ensure reliable detection of defects and damages  Understanding of the purpose of the “enhanced survey programme”		

**Function: Controlling the operation of the ship and care for persons on board 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
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</p> <p>Anti-pollution procedures and all associated equipment</p> <p>Importance of proactive measures to protect the marine environment</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 training</p>	<p>Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed</p> <p>Actions to ensure that a positive environmental reputation is maintained</p>
Maintain seaworthiness of the ship	<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>
Prevent, control and fight fires on board	<p><i>Fire prevention and fire-fighting appliances</i></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>Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3</p>	<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</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>Knowledge of action to be taken in the event of fire, including fires involving oil systems</p>		<p>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>
<p>Operate life-saving appliances</p>	<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>Assessment of evidence obtained from approved training and experience as set out in section A-VI/2, paragraphs 1 to 4</p>	<p>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</p>
<p>Apply medical first aid on board ship</p>	<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>	<p>Assessment of evidence obtained from approved training as set out in section A-VI/4, paragraphs 1 to 3</p>	<p>The identification of probable cause, nature and extent of injuries or conditions is prompt and treatment minimizes immediate threat to life</p>
<p>Monitor compliance with legislative requirements</p>	<p>Basic working knowledge of the relevant IMO conventions concerning safety of life at sea, security and protection of the marine environment</p>	<p>Assessment of evidence obtained from examination or approved training</p>	<p>Legislative requirements relating to safety of life at sea, security and protection of the marine environment are correctly identified</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Application of leadership and teamworking skills	<p>Working knowledge of shipboard personnel management and training</p> <p>A knowledge of related international maritime conventions and recommendations, and national legislation</p> <p>Ability to apply task and workload management, including:</p> <ul style="list-style-type: none"> <li>.1 planning and co-ordination</li> <li>.2 personnel assignment</li> <li>.3 time and resource constraints</li> <li>.4 prioritization</li> </ul> <p>Knowledge and ability to apply effective resource management:</p> <ul style="list-style-type: none"> <li>.1 allocation, assignment, and prioritization of resources</li> <li>.2 effective communication onboard and ashore</li> <li>.3 decisions reflect consideration of team experiences</li> <li>.4 assertiveness and leadership, including motivation</li> <li>.5 obtaining and maintaining situational awareness</li> </ul>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved training</li> <li>.2 approved in-service experience</li> <li>.3 practical demonstration</li> </ul>	<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 assessment of current competence and capabilities and operational requirements</p> <p>Operations are demonstrated to be in accordance with applicable rules</p> <p>Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Effective leadership behaviours are demonstrated</p> <p>Necessary team member(s) share accurate understanding of current and predicted vessel status and operational status and external environment</p> <p>Decisions are most effective for the situation</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Application of leadership and teamworking skills (continued)	Knowledge and ability to apply decision-making techniques: .1 situation and risk assessment .2 identify and consider generated options .3 selecting course of action .4 evaluation of outcome effectiveness		
Contribute to the safety of personnel and ship	Knowledge of personal survival techniques Knowledge of fire prevention and ability to fight and extinguish fires Knowledge of elementary first aid Knowledge of personal safety and social responsibilities	Assessment of evidence obtained from approved training and experience as set out in section A-VI/1, paragraph 2	Appropriate safety and protective equipment is correctly used Procedures and safe working practices designed to safeguard personnel and the ship are observed at all times Procedures designed to safeguard the environment are observed at all times Initial and follow-up action on becoming aware of an emergency conforms with established emergency response procedures

**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 and security 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 and security 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.

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\* The relevant IMO Model Course(s) 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
<p>Plan a voyage and conduct navigation</p>	<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"> <li>.1 restricted waters</li> <li>.2 meteorological conditions</li> <li>.3 ice</li> <li>.4 restricted visibility</li> <li>.5 traffic separation schemes</li> <li>.6 vessel traffic service (VTS) areas</li> <li>.7 areas of extensive tidal effects</li> </ul> <p>Routeing in accordance with the General Provisions on Ships' Routeing</p> <p>Reporting in accordance with the General principles for Ship Reporting Systems and with VTS procedures</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved simulator training, where appropriate</li> <li>.3 approved laboratory equipment training</li> </ul> <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>
<p>Determine position and the accuracy of resultant position fix by any means</p>	<p>Position determination in all conditions:</p> <ul style="list-style-type: none"> <li>.1 by celestial observations</li> <li>.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</li> <li>.3 using modern electronic</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved simulator training, where appropriate</li> <li>.3 approved laboratory equipment training</li> </ul>	<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</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p> 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>using:</p> <ul style="list-style-type: none"> <li>.1 charts, nautical almanac, plotting sheets, chronometer, sextant and a calculator</li> <li>.2 charts, nautical publications and navigational instruments (azimuth mirror, sextant, log, sounding equipment, compass) and manufacturers' manuals</li> <li>.3 radar, terrestrial electronic position-fixing systems, satellite navigation systems and appropriate nautical charts and publications</li> </ul>	<p>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>
<p>Determine and allow for compass errors</p>	<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> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved simulator training, where appropriate</li> <li>.3 approved laboratory equipment training</li> </ul> <p>using: 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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Coordinate search and rescue operations	A thorough knowledge of and ability to apply the procedures contained in the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved simulator training, where appropriate</li> <li>.3 approved laboratory equipment training</li> </ul> <p>using: 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"> <li>.1 approved SAR training course</li> <li>.2 approved simulator training, where appropriate</li> <li>.3 approved laboratory equipment training</li> </ul>	<p>The plan for coordinating 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>
Establish watchkeeping arrangements and procedures	<p>Thorough knowledge of content, application and intent of the International Regulations for Preventing Collisions at Sea, 1972, as amended</p> <p>Thorough knowledge of the content, application and intent of the Principles to be observed in keeping a navigational watch</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved simulator training, where appropriate</li> </ul>	<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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain safe navigation through the use of information from navigation equipment and systems to assist command decision making</p> <p><i>Note:</i> 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 navigational systems</p> <p>Blind pilotage planning</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 interrelationship and optimum use of all navigational data available for conducting navigation</p>	<p>Examination and assessment of evidence obtained from approved ARPA simulator and 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>Information obtained from navigation equipment and systems 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, 1972, as amended</p>
<p>Maintain the safety of navigation through the use of ECDIS and associated navigation systems to assist command decision making</p> <p><i>Note:</i> Training and assessment in the use of ECDIS is not required for those who serve exclusively on ships not fitted with ECDIS. This limitation shall be reflected in the endorsement issued to the seafarer concerned</p>	<p>Management of operational procedures, system files and data, including:</p> <p>.1 manage procurement, licensing and updating of chart data and system software to conform to established procedures</p> <p>.2 system and information updating, including the ability to update ECDIS system version in accordance with vendor's product development</p> <p>.3 create and maintain system configuration and backup files</p> <p>.4 create and maintain log files in accordance with established procedures</p> <p>.5 create and maintain route plan files in accordance with established procedures</p>	<p>Assessment of evidence obtained from one of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved ECDIS simulator training</p>	<p>Operational procedures for using ECDIS are established, applied, and monitored</p> <p>Actions taken to minimize risk to safety of navigation</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>.6 use ECDIS log-book and track history functions for inspection of system functions, alarm settings and user responses</p> <p>Use ECDIS playback functionality for passage review, route planning and review of system functions</p>		
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 nautical 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>
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>Examination and assessment of evidence obtained from practical instruction, in-service experience and practical drills in emergency procedures</p>	<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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>Assessment of damage control</p> <p>Emergency steering</p> <p>Emergency towing arrangements and towing procedure</p>		
<p>Manoeuvre and handle a ship in all conditions</p>	<p>Manoeuvring and handling a ship in all conditions, including:</p> <p>.1 manoeuvres when approaching pilot stations and embarking or disembarking pilots, with due regard to weather, tide, headreach and stopping distances</p> <p>.2 handling ship in rivers, estuaries and restricted waters, having regard to the effects of current, wind and restricted water on helm response</p> <p>.3 application of constant-rate-of-turn techniques</p> <p>.4 manoeuvring in shallow water, including the reduction in under-keel clearance caused by squat, rolling and pitching</p> <p>.5 interaction between passing ships and between own ship and nearby banks (canal effect)</p> <p>.6 berthing and unberthing under various conditions of wind, tide and current with and without tugs</p> <p>.7 ship and tug interaction</p> <p>.8 use of propulsion and manoeuvring 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 simulator training, where appropriate</p> <p>.3 approved manned scale ship model, where appropriate</p>	<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 under way, 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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Manoeuvre and handle a ship in all conditions <i>(continued)</i>	.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  .10 dragging anchor; clearing fouled anchors  .11 dry-docking, both with and without damage  .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  .13 precautions in manoeuvring to launch rescue boats or survival craft in bad weather  .14 methods of taking on board survivors from rescue boats and survival craft  .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  .16 importance of navigating at reduced speed to avoid damage caused by own ship's bow wave and stern wave		

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Manoeuvre and handle a ship in all conditions (continued)	.17 practical measures to be taken when navigating in or near ice or in conditions of ice accumulation on board  .18 use of, and manoeuvring in and near, traffic separation schemes and in vessel traffic service (VTS) areas		
Operate remote controls of propulsion plant and engineering systems and services	Operating principles of marine power plants  Ships' auxiliary machinery  General knowledge of marine engineering terms	Examination and assessment of evidence obtained from one or more of the following:  .1 approved in-service experience  .2 approved simulator training, where appropriate	Plant, auxiliary machinery and equipment is operated in accordance with technical specifications and within safe operating limits at all times

**Function: Cargo handling and stowage 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 ensure safe loading, stowage, securing, care during the voyage and unloading of cargoes	Knowledge of and ability to apply relevant international regulations, codes and standards concerning the safe handling, stowage, securing and transport of cargoes  Knowledge of the effect on trim and stability of cargoes and cargo operations  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	Examination and assessment of evidence obtained from one or more of the following:  .1 approved in-service experience  .2 approved simulator training, where appropriate  using: stability, trim and stress tables, diagrams and stress-calculating equipment	The frequency and extent of cargo condition monitoring is appropriate to its nature and prevailing conditions  Unacceptable or unforeseen variations in the condition or specification of the cargo are promptly recognized and remedial action is immediately taken and designed to safeguard the safety of the ship and those on board  Cargo operations are planned and executed in accordance with



Column 1	Column 2	Column 3	Column 4
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 (continued)</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>Knowledge of the operational and design limitations of bulk carriers</p> <p>Ability to use all available shipboard data related to loading, care and unloading of bulk cargoes</p> <p>Ability to establish procedures for safe cargo handling in accordance with the provisions of the relevant instruments such as IMDG Code, IMSBC Code, MARPOL 73/78 Annexes III and V and other relevant information</p> <p>Ability to explain the basic principles for establishing effective communications and improving working relationship between ship and terminal personnel</p>		<p>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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Assess reported defects and damage to cargo spaces, hatch covers and ballast tanks and take appropriate action	<p>Knowledge of the limitations on strength of the vital constructional parts of a standard bulk carrier and ability to interpret given figures for bending moments and shear forces</p> <p>Ability to explain how to avoid the detrimental effects on bulk carriers of corrosion, fatigue and inadequate cargo handling</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>Evaluations are based on accepted principles, well-founded arguments and correctly carried out. The decisions taken are acceptable, taking into consideration the safety of the ship and the prevailing conditions</p>
Carriage of dangerous goods	<p>International regulations, standards, codes and recommendations on the carriage of dangerous cargoes, including the International Maritime Dangerous Goods (IMDG) Code and the International Maritime Solid Bulk Cargoes (IMSBC) 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>

**Function: Controlling the operation of the ship and care for persons on board 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
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 countermeasures 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> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> </ul>	<p>Stability and stress conditions are maintained within safe limits at all times</p>

Column 1	Column 2	Column 3	Column 4
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, security and the protection of the marine environment</p>	<p>Knowledge of international maritime law embodied in international agreements and conventions</p> <p>Regard shall be paid especially to the following subjects:</p> <ol style="list-style-type: none"> <li>.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</li> <li>.2 responsibilities under the relevant requirements of the International Convention on Load Lines, 1966, as amended</li> <li>.3 responsibilities under the relevant requirements of the International Convention for the Safety of Life at Sea, 1974, as amended</li> <li>.4 responsibilities under the International Convention for the Prevention of Pollution from Ships, as amended</li> <li>.5 maritime declarations of health and the requirements of the International Health Regulations</li> <li>.6 responsibilities under international instruments affecting the safety of the ship, passengers, crew and cargo</li> <li>.7 methods and aids to prevent pollution of the marine environment by ships</li> <li>.8 national legislation for implementing international agreements and conventions</li> </ol>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> </ol>	<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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>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>	<p>Thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea)</p> <p>Organization of fire drills 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 salve the ship following a 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>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>	<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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Use of leadership and managerial skill	<p>Knowledge of shipboard personnel management and training</p> <p>A knowledge of related international maritime conventions and recommendations, and national legislation</p> <p>Ability to apply task and workload management, including:</p> <ul style="list-style-type: none"> <li>.1 planning and co-ordination</li> <li>.2 personnel assignment</li> <li>.3 time and resource constraints</li> <li>.4 prioritization</li> </ul> <p>Knowledge and ability to apply effective resource management:</p> <ul style="list-style-type: none"> <li>.1 allocation, assignment, and prioritization of resources</li> <li>.2 effective communication on board and ashore</li> <li>.3 decisions reflect consideration of team experiences</li> <li>.4 assertiveness and leadership, including motivation</li> <li>.5 obtaining and maintaining situation awareness</li> </ul> <p>Knowledge and ability to apply decision-making techniques:</p> <ul style="list-style-type: none"> <li>.1 situation and risk assessment</li> <li>.2 identify and generate options</li> <li>.3 selecting course of action</li> </ul>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved training</li> <li>.2 approved in-service experience</li> <li>.3 approved simulator training</li> </ul>	<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 assessment of current competence and capabilities and operational requirements</p> <p>Operations are demonstrated to be in accordance with applicable rules</p> <p>Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Effective leadership behaviours are demonstrated</p> <p>Necessary team member(s) share accurate understanding of current and predicted vessel state and</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Use of leadership and managerial skill (continued)	.4 evaluation of outcome effectiveness  Development, implementation, and oversight of standard operating procedures		operational status and external environment  Decisions are most effective for the situation  Operations are demonstrated to be effective and in accordance with applicable rules
Organize and manage the provision of medical care on board	A thorough knowledge* of the use and contents of the following publications:  .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	Actions taken and procedures followed correctly apply and make full use of advice available

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\* The relevant IMO Model Course(s) 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 the 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 the 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 be based on section A-VIII/2, part 4-1 – 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/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 onboard 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\*.

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\* The relevant IMO Model Course(s) and a similar document produced by the International Shipping Federation may be of assistance in the preparation of training record books.



## **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.

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
<p>Plan and conduct a coastal passage and determine position</p> <p>Note: Training and assessment in the use of ECDIS is not required for those who serve exclusively on ships not fitted with ECDIS. These limitations shall be reflected in the endorsement issued to the seafarer concerned</p>	<p><i>Navigation</i></p> <p>Ability to determine the ship's position by the use of:</p> <p>.1 landmarks</p> <p>.2 aids to navigation, including lighthouses, beacons and buoys</p> <p>.3 dead reckoning, taking into account winds, tides, currents and estimated speed</p> <p>Thorough knowledge of and ability to use nautical 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 General Principles for Ship Reporting Systems and with VTS procedures</p> <p><i>Note:</i> This item is only required for certification as master</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>using: chart catalogues, charts, nautical publications, radio navigational warnings, sextant, azimuth mirror, electronic navigation equipment, echo-sounding equipment, compass</p>	<p>Information obtained from nautical 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> <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>

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 coastal passage and determine position (<i>continued</i>)</p>	<p>Voyage planning and navigation for all conditions by acceptable methods of plotting coastal tracks, taking into account, e.g.:</p> <ul style="list-style-type: none"> <li>.1 restricted waters</li> <li>.2 meteorological conditions</li> <li>.3 ice</li> <li>.4 restricted visibility</li> <li>.5 traffic separation schemes</li> <li>.6 vessel traffic service (VTS) areas</li> <li>.7 areas of extensive tidal effects</li> </ul> <p><i>Note:</i> This item is only required for certification as master</p> <p>Thorough knowledge of and ability to use ECDIS</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved training ship experience</li> <li>.2 approved ECDIS simulator training</li> </ul>	

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 coastal passage and determine position (continued)</p>	<p><i>Navigational aids and equipment</i></p> <p>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></p> <p>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><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>Assessment of evidence obtained from approved radar simulator</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> <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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain a safe navigational watch</p>	<p><i>Watchkeeping</i></p> <p>Thorough knowledge of content, application and intent of the International Regulations for Preventing Collisions at Sea, 1972, as amended</p> <p>Knowledge of content of the 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>Use of reporting in accordance with the General Principles for Ship Reporting Systems and with VTS procedures</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> <li>.4 approved laboratory equipment training</li> </ul>	<p>The conduct, handover and relief of the watch conforms with accepted principles and procedures</p> <p>A proper look-out 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, 1972, as amended 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>Action to avoid close encounters and collision with other vessels is in accordance with the International Regulations for Preventing Collisions at Sea, 1972, as amended</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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Respond to emergencies	<p>Emergency procedures, including:</p> <ul style="list-style-type: none"> <li>.1 precautions for the protection and safety of passengers in emergency situations</li> <li>.2 initial assessment of damage and damage control</li> <li>.3 action to be taken following a collision</li> <li>.4 action to be taken following a grounding</li> </ul> <p>In addition, the following material should be included for certification as master:</p> <ul style="list-style-type: none"> <li>.1 emergency steering</li> <li>.2 arrangements for towing and for being taken in tow</li> <li>.3 rescuing persons from the sea</li> <li>.4 assisting a vessel in distress</li> <li>.5 appreciation of the action to be taken when emergencies arise in port</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> <li>.4 practical instruction</li> </ul>	<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>
Respond to a distress signal at sea	<p><i>Search and rescue</i></p> <p>Knowledge of the contents of the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual</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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Manoeuvre the ship and operate small ship power plants</p>	<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**

Column 1	Column 2	Column 3	Column 4
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**

Column 1	Column 2	Column 3	Column 4
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</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>



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<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> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> <li>.4 approved laboratory equipment training</li> </ul>	<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>
<p>Prevent, control and fight fires on board</p>	<p><i>Fire prevention and fire-fighting appliances</i></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>	<p>Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3</p>	<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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
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>	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
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, security and protection of the marine environment	Assessment of evidence obtained from examination or approved training	Legislative requirements relating to safety of life at sea, security and protection of the marine environment are correctly identified
Contribute to the safety of personnel and ship	<p>Knowledge of personal survival techniques</p> <p>Knowledge of fire prevention and ability to fight and extinguish fires</p> <p>Knowledge of elementary first aid</p> <p>Knowledge of personal safety and social responsibilities</p>	Assessment of evidence obtained from approved training and experiences as set out in section A-VI/1, paragraph 2	<p>Appropriate safety and protective equipment is correctly used</p> <p>Procedures and safe working practices designed to safeguard personnel and the ship are observed at all times</p> <p>Procedures designed to safeguard the environment are observed at all times</p> <p>Initial and follow-up actions on becoming aware of an emergency conform with established emergency response procedures</p>

## **Section A-II/4**

*Mandatory minimum requirements for certification of 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 trainees 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**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Steer the ship and also comply with helm orders 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  .3 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	Assessment of evidence obtained from:  .1 practical test, or  .2 approved in-service experience, or  .3 approved training ship experience	Sound signals, lights and other objects are promptly detected and their approximate bearing, in degrees or points, is reported to the officer of the watch
Contribute to monitoring and controlling a safe watch	Shipboard terms and definitions  Use of appropriate internal communication and alarm systems  Ability to understand orders and to communicate with the officer of the watch on matters relevant to watchkeeping duties  Procedures for the relief, maintenance and handover of a watch  Information required to maintain a safe watch  Basic environmental protection procedures	Assessment of evidence obtained from approved in-service experience or approved training ship experience	Communications are clear and concise and advice/clarification is sought from the officer on watch where watch information or instructions are not clearly understood  Maintenance, handover and relief of the watch is in conformity with accepted practices and procedures

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Operate emergency equipment and apply emergency procedures	<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>	Assessment of evidence obtained from demonstration and approved in-service experience or approved training ship experience	<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>

**Section A-II/5**

*Mandatory minimum requirements for certification of ratings as able seafarer deck*

**Standard of competence**

- 1 Every able seafarer deck serving on a seagoing ship of 500 gross tonnage or more shall be required to demonstrate the competence to perform the functions at the support level, as specified in column 1 of table A-II/5.
- 2 The minimum knowledge, understanding and proficiency required of an able seafarer deck serving on a seagoing ship of 500 gross tonnage or more is listed in column 2 of table A-II/5.
- 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/5.

Table A-II/5

**Specification of minimum standards of competence of ratings as able seafarer deck**

**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
Contribute to a safe navigational watch	Ability to understand orders and to communicate with the officer of the watch on matters relevant to watchkeeping duties  Procedures for the relief, maintenance and handover of a watch  Information required to maintain a safe watch	Assessment of evidence obtained from in-service experience or practical test	Communications are clear and concise  Maintenance, handover and relief of the watch is in conformity with acceptable practices and procedures
Contribute to berthing, anchoring and other mooring operations	Working knowledge of the mooring system and related procedures, including: <ul style="list-style-type: none"> <li>.1 the function of mooring and tug lines and how each line functions as part of an overall system</li> <li>.2 the capacities, safe working loads, and breaking strengths of mooring equipment, including mooring wires, synthetic and fibre lines, winches, anchor windlasses, capstans, bits, chocks and bollards</li> <li>.3 the procedures and order of events for making fast and letting go mooring and tug lines and wires, including towing lines</li> <li>.4 the procedures and order of events for the use of anchors in various operations</li> </ul> Working knowledge of the procedures and order of events associated with mooring to a buoy or buoys	Assessment of evidence obtained from one or more of the following: <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 practical training</li> <li>.3 examination</li> <li>.4 approved training ship experience</li> <li>.5 approved simulator training, where appropriate</li> </ul>	Operations are carried out in accordance with established safety practices and equipment operating instructions

**Function: Cargo handling and stowage at the support level**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Contribute to the handling of cargo and stores	<p>Knowledge of procedures for safe handling, stowage and securing of cargoes and stores, including dangerous, hazardous and harmful substances and liquids</p> <p>Basic knowledge of and precautions to observe in connection with particular types of cargo and identification of IMDG labelling</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 practical training</p> <p>.3 examination</p> <p>.4 approved training ship experience</p> <p>.5 approved simulator training, where appropriate</p>	<p>Cargo and stores operations are carried out in accordance with established safety procedures and equipment operating instructions</p> <p>The handling of dangerous, hazardous and harmful cargoes or stores complies with established safety practices</p>

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

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Contribute to the safe operation of deck equipment and machinery	<p>Knowledge of deck equipment, including:</p> <p>.1 function and uses of valves and pumps, hoists, cranes, booms, and related equipment</p> <p>.2 function and uses of winches, windlasses, capstans and related equipment</p> <p>.3 hatches, watertight doors, ports, and related equipment</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 practical training</p> <p>.3 examination</p> <p>.4 approved training ship experience</p>	<p>Operations are carried out in accordance with established safety practices and equipment operating instructions</p>



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Contribute to the safe operation of deck equipment and machinery (<i>continued</i>)</p>	<p>.4 fibre and wire ropes, cables and chains, including their construction, use, markings, maintenance and proper stowage</p> <p>.5 ability to use and understand basic signals for the operation of equipment, including winches, windlasses, cranes, and hoists</p> <p>.6 ability to operate anchoring equipment under various conditions, such as anchoring, weighing anchor, securing for sea, and in emergencies</p> <p>Knowledge of the following procedures and ability to:</p> <p>.1 rig and unrig bosun's chairs and staging</p> <p>.2 rig and unrig pilot ladders, hoists, rat-guards and gangways</p> <p>.3 use marlin spike seamanship skills, including the proper use of knots, splices and stoppers</p> <p>Use and handling of deck and cargo-handling gear and equipment:</p> <p>.1 access arrangements, hatches and hatch covers, ramps, side/bow/stern doors or elevators</p> <p>.2 pipeline systems – bilge and ballast suction and wells</p>	<p>Assessment of evidence obtained from practical demonstration</p> <p>Assessment of evidence obtained from practical demonstration</p> <p>Assessment of evidence obtained from practical demonstration</p>	<p>Communications within the operator's area of responsibility are consistently successful</p> <p>Equipment operation is safely carried out in accordance with established procedures</p> <p>Demonstrate the proper methods for rigging and unrigging in accordance with safe industry practice</p> <p>Demonstrate the proper creation and use of knots, splices, stoppers, whippings, servings as well as proper canvas handling</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Contribute to the safe operation of deck equipment and machinery (continued)	.3 cranes, derricks, winches  Knowledge of hoisting and dipping flags and the main single-flag signals. (A, B, G, H, O, P, Q)		Demonstrate the proper use of blocks and tackle  Demonstrate the proper methods for handling lines, wires, cables and chains
Apply occupational health and safety precautions	Working knowledge of safe working practices and personal shipboard safety including:  .1 working aloft .2 working over the side .3 working in enclosed spaces .4 permit to work systems .5 line handling .6 lifting techniques and methods of preventing back injury .7 electrical safety .8 mechanical safety .9 chemical and biohazard safety .10 personal safety equipment	Assessment of evidence obtained from one or more of the following:  .1 approved in-service experience .2 practical training .3 examination .4 approved training ship experience	Procedures designed to safeguard personnel and the ship are observed at all times  Safe working practices are observed and appropriate safety and protective equipment is correctly used at all times
Apply precautions and contribute to the prevention of pollution of the marine environment	Knowledge of the precautions to be taken to prevent pollution of the marine environment  Knowledge of the use and operation of anti-pollution equipment  Knowledge of the approved methods for disposal of marine pollutants	Assessment of evidence obtained from one or more of the following:  .1 approved in-service experience .2 practical training .3 examination .4 approved training ship experience	Procedures designed to safeguard the marine environment are observed at all times

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Operate survival craft and rescue boats	<p>Knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment</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

**Function: Maintenance and repair at the support level**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Contribute to shipboard maintenance and repair	<p>Ability to use painting, lubrication and cleaning materials and equipment</p> <p>Ability to understand and execute routine maintenance and repair procedures</p> <p>Knowledge of surface preparation techniques</p> <p>Understanding manufacturer's safety guidelines and shipboard instructions</p> <p>Knowledge of safe disposal of waste materials</p> <p>Knowledge of the application, maintenance and use of hand and power tools</p>	<p>Assessment of evidence obtained from practical demonstration</p> <p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 practical training</p> <p>.3 examination</p> <p>.4 approved training ship experience</p>	Maintenance and repair activities are carried out in accordance with technical, safety and procedural specifications

## CHAPTER III

### Standards regarding 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 as designated duty engineers in a periodically unmanned engine-room*

#### Training

1 The education and training required by paragraph 2.4 of regulation III/1 shall include training in mechanical and electrical workshop skills relevant to the duties of an engineer officer.

#### Onboard 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 whose seagoing service, in accordance with paragraph 2.2 of regulation III/1, forms part of a training programme approved as meeting the requirements of this section shall follow an approved programme of onboard 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.\*

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\* The relevant IMO Model Course(s) 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/2, part 4-2 – 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 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.

9 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**

10 The requirements of paragraphs 2.2 to 2.5 of regulation III/1 relating to level of knowledge, understanding and proficiency required under the different sections listed in column 2 of table A-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, 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.

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**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Maintain a safe engineering watch	<p>Thorough knowledge of 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 logs and the significance of the readings taken</p> <p>.4 duties associated with handing over a watch</p> <p>Safety and emergency procedures; change-over 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>	<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 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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain a safe engineering watch (continued)</p>	<p><i>Engine-room resource management</i></p> <p>Knowledge of engine-room resource management principles, including:</p> <ul style="list-style-type: none"> <li>.1 allocation, assignment, and prioritization of resources</li> <li>.2 effective communication</li> <li>.3 assertiveness and leadership</li> <li>.4 obtaining and maintaining situational awareness</li> <li>.5 consideration of team experience</li> </ul>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved training</li> <li>.2 approved in-service experience</li> <li>.3 approved simulator training</li> </ul>	<p>Resources are allocated and assigned as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Questionable decisions and/or actions result in appropriate challenge and response</p> <p>Effective leadership behaviours are identified</p> <p>Team member(s) share accurate understanding of current and predicted engine-room and associated systems state, and of external environment</p>
<p>Use English in written and oral form</p>	<p>Adequate knowledge of the English language to enable the officer to use engineering publications and to perform engineering duties</p>	<p>Examination and assessment of evidence obtained from practical instruction</p>	<p>English language publications relevant to engineering duties are correctly interpreted</p> <p>Communications are clear and understood</p>
<p>Use internal communication systems</p>	<p>Operation of all internal communication systems on board</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> <li>.4 approved laboratory equipment training</li> </ul>	<p>Transmission and reception of messages are consistently successful</p> <p>Communication records are complete, accurate and comply with statutory requirements</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Operate main and auxiliary machinery and associated control systems	<p>Basic construction and operation principles of machinery systems, including:</p> <ul style="list-style-type: none"> <li>.1 marine diesel engine</li> <li>.2 marine steam turbine</li> <li>.3 marine gas turbine</li> <li>.4 marine boiler</li> <li>.5 shafting installations, including propeller</li> <li>.6 other auxiliaries, including various pumps, air compressor, purifier, fresh water generator, heat exchanger, refrigeration, air-conditioning and ventilation systems</li> <li>.7 steering gear</li> <li>.8 automatic control systems</li> <li>.9 fluid flow and characteristics of lubricating oil, fuel oil and cooling systems</li> <li>.10 deck machinery</li> </ul> <p>Safety and emergency procedures for operation of propulsion plant machinery, including control systems</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved laboratory equipment training</li> </ul>	<p>Construction and operating mechanisms can be understood and explained with drawings/instructions</p>



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Operate main and auxiliary machinery and associated control systems <i>(continued)</i>	<p>Preparation, operation, fault detection and necessary measures to prevent damage for the following machinery items and control systems:</p> <ul style="list-style-type: none"> <li>.1 main engine and associated auxiliaries</li> <li>.2 steam boiler and associated auxiliaries and steam systems</li> <li>.3 auxiliary prime movers and associated systems</li> <li>.4 other auxiliaries, including refrigeration, air-conditioning and ventilation systems</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> <li>.4 approved laboratory equipment training</li> </ul>	<p>Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations and avoid pollution of the marine environment</p> <p>Deviations from the norm are promptly identified</p> <p>The output of plant and engineering systems consistently meets requirements, including bridge orders relating to changes in speed and direction</p> <p>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</p>
Operate fuel, lubrication, ballast and other pumping systems and associated control systems	<p>Operational characteristics of pumps and piping systems, including control systems</p> <p>Operation of pumping systems:</p> <ul style="list-style-type: none"> <li>.1 routine pumping operations</li> <li>.2 operation of bilge, ballast and cargo pumping systems</li> </ul> <p>Oily-water separators (or-similar equipment) requirements and operation</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> <li>.4 approved laboratory equipment training</li> </ul>	<p>Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations and avoid pollution of the marine environment</p> <p>Deviations from the norm are promptly identified and appropriate action is taken</p>

**Function: Electrical, electronic and control 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
Operate electrical, electronic and control systems	<p>Basic configuration and operation principles of the following electrical, electronic and control equipment:</p> <p>.1 electrical equipment:</p> <p>.a generator and distribution systems</p> <p>.b preparing, starting, paralleling and changing over generators</p> <p>.c electrical motors including starting methodologies</p> <p>.d high-voltage installations</p> <p>.e sequential control circuits and associated system devices</p> <p>.2 electronic equipment:</p> <p>.a characteristics of basic electronic circuit elements</p> <p>.b flowchart for automatic and control systems</p> <p>.c functions, characteristics and features of control systems for machinery items, including main propulsion plant operation control and steam boiler automatic controls</p> <p>.3 control systems:</p> <p>.a various automatic control methodologies and characteristics</p> <p>.b Proportional–Integral–Derivative (PID) control characteristics and associated system devices for process control</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>Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations</p> <p>Electrical, electronic and control systems can be understood and explained with drawings/instructions</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintenance and repair of electrical and electronic equipment</p>	<p>Safety requirements for working on shipboard electrical systems, including the safe isolation of electrical equipment required before personnel are permitted to work on such equipment</p> <p>Maintenance and repair of electrical system equipment, switchboards, electric motors, generator and DC electrical systems and equipment</p> <p>Detection of electric malfunction, location of faults and measures to prevent damage</p> <p>Construction and operation of electrical testing and measuring equipment</p> <p>Function and performance tests of the following equipment and their configuration:</p> <p>.1 monitoring systems</p> <p>.2 automatic control devices</p> <p>.3 protective devices</p> <p>The interpretation of electrical and simple electronic diagrams</p>	<p>Examination and 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>.3 approved in-service experience</p> <p>.4 approved training ship experience</p>	<p>Safety measures for working are appropriate</p> <p>Selection and use of hand tools, measuring instruments, and testing equipment are appropriate and interpretation of results is accurate</p> <p>Dismantling, inspecting, repairing and reassembling equipment are in accordance with manuals and good practice</p> <p>Reassembling and performance testing is in accordance with manuals and good practice</p>

**Function: Maintenance and repair at the operational level**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board	<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>Methods for carrying out safe emergency/temporary repairs</p> <p>Safety measures to be taken to ensure a safe working environment and for using hand tools, machine tools and measuring instruments</p> <p>Use of hand tools, machine tools and measuring instruments</p> <p>Use of various types of sealants and packings</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>.3 approved in-service experience</p> <p>.4 approved training ship experience</p>	<p>Identification of important parameters for fabrication of typical ship-related components is appropriate</p> <p>Selection of materials is appropriate</p> <p>Fabrication is to designated tolerances</p> <p>Use of equipment and hand tools, machine tools and measuring instruments is appropriate and safe</p>
Maintenance and repair of shipboard machinery and equipment	<p>Safety measures to be taken for repair and maintenance, including the safe isolation of shipboard machinery and equipment required before personnel are permitted to work on such machinery or equipment</p> <p>Appropriate basic mechanical knowledge and skills</p>	<p>Examination and 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>.3 approved in-service experience</p>	<p>Safety procedures followed are appropriate</p> <p>Selection of tools and spare gear is appropriate</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Maintenance and repair of shipboard machinery and equipment <i>(continued)</i>	<p>Maintenance and repair, such as dismantling, adjustment and reassembling of machinery and equipment</p> <p>The use of appropriate specialized tools and measuring instruments</p> <p>Design characteristics and selection of materials in construction of equipment</p> <p>Interpretation of machinery drawings and handbooks</p> <p>The interpretation of piping, hydraulic and pneumatic diagrams</p>	.4 approved training ship experience	<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> <p>Selection of materials and parts is appropriate</p>

**Function: Controlling the operation of the ship and care for persons on board 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
Ensure compliance with pollution-prevention requirements	<p><i>Prevention of pollution of the marine environment</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>Importance of proactive measures to protect the marine environment</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 training</p>	<p>Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed</p> <p>Actions to ensure that a positive environmental reputation is maintained</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Maintain seaworthiness of the ship	<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 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></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>
Prevent, control and fight fires on board	<p><i>Fire prevention and fire-fighting appliances</i></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>	<p>Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3, paragraphs 1 to 3</p>	<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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
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>Assessment of evidence obtained from approved training and experience as set out in section A-VI/2, paragraphs 1 to 4</p>	<p>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</p>
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>	<p>Assessment of evidence obtained from approved training as set out in section A-VI/4, paragraphs 1 to 3</p>	<p>Identification of probable cause, nature and extent of injuries or conditions is prompt and treatment minimizes immediate threat to life</p>
Monitor compliance with legislative requirements	<p>Basic working knowledge of the relevant IMO conventions concerning safety of life at sea, security and protection of the marine environment</p>	<p>Assessment of evidence obtained from examination or approved training</p>	<p>Legislative requirements relating to safety of life at sea, security and protection of the marine environment are correctly identified</p>
Application of leadership and teamworking skills	<p>Working knowledge of shipboard personnel management and training</p> <p>A knowledge of related international maritime conventions and recommendations, and national legislation</p> <p>Ability to apply task and workload management, including:</p> <ul style="list-style-type: none"> <li>.1 planning and co-ordination</li> <li>.2 personnel assignment</li> <li>.3 time and resource constraints</li> <li>.4 prioritization</li> </ul>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved training</li> <li>.2 approved in-service experience</li> <li>.3 practical demonstration</li> </ul>	<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 assessment of current competence and capabilities and operational requirements.</p> <p>Operations are demonstrated to be in accordance with applicable rules</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Application of leadership and teamworking skills <i>(continued)</i>	<p>Knowledge and ability to apply effective resource management:</p> <ul style="list-style-type: none"> <li>.1 allocation, assignment, and prioritization of resources</li> <li>.2 effective communication on board and ashore</li> <li>.3 decisions reflect consideration of team experiences</li> <li>.4 assertiveness and leadership, including motivation</li> <li>.5 obtaining and maintaining situational awareness</li> </ul> <p>Knowledge and ability to apply decision-making techniques:</p> <ul style="list-style-type: none"> <li>.1 situation and risk assessment</li> <li>.2 identify and consider generated options</li> <li>.3 selecting course of action</li> <li>.4 evaluation of outcome effectiveness</li> </ul>		<p>Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Effective leadership behaviours are demonstrated</p> <p>Necessary team member(s) share accurate understanding of current and predicted vessel state and operational status and external environment</p> <p>Decisions are most effective for the situation</p>



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Contribute to the safety of personnel and ship</p>	<p>Knowledge of personal survival techniques</p> <p>Knowledge of fire prevention and ability to fight and extinguish fires</p> <p>Knowledge of elementary first aid</p> <p>Knowledge of personal safety and social responsibilities</p>	<p>Assessment of evidence obtained from approved training and experience as set out in section A-VI/1, paragraph 2</p>	<p>Appropriate safety and protective equipment is correctly used</p> <p>Procedures and safe working practices designed to safeguard personnel and the ship are observed at all times</p> <p>Procedures designed to safeguard the environment are observed at all times</p> <p>Initial and follow-up actions on becoming aware of an emergency conform with established emergency response procedures</p>

**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 engineer officers of ships powered by main propulsion machinery 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.

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\* The relevant IMO Model Course(s) 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
Manage the operation of propulsion plant machinery	Design features, and operative mechanism of the following machinery and associated auxiliaries:  .1 marine diesel engine  .2 marine steam turbine  .3 marine gas turbine  .4 marine steam boiler	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	Explanation and understanding of design features and operating mechanisms are appropriate
Plan and schedule operations	<i>Theoretical knowledge</i>  Thermodynamics and heat transmission  Mechanics and hydromechanics  Propulsive characteristics of diesel engines, steam and gas turbines, including speed, output and fuel consumption  Heat cycle, thermal efficiency and heat balance of the following:  .1 marine diesel engine  .2 marine steam turbine  .3 marine gas turbine  .4 marine steam boiler	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	The planning and preparation of operations is suited to the design parameters of the power installation and to the requirements of the voyage

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 (continued)	Refrigerators and refrigeration cycle  Physical and chemical properties of fuels and lubricants  Technology of materials  Naval architecture and ship construction, including damage control		
Operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery	<p><i>Practical knowledge</i></p> <p>Start up and shut down main propulsion and auxiliary machinery, including associated systems</p> <p>Operating limits of propulsion plant</p> <p>The efficient operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery</p> <p>Functions and mechanism of automatic control for main engine</p> <p>Functions and mechanism of automatic control for auxiliary machinery including but not limited to:</p> <ol style="list-style-type: none"> <li>.1 generator distribution systems</li> <li>.2 steam boilers</li> <li>.3 oil purifier</li> <li>.4 refrigeration system</li> <li>.5 pumping and piping systems</li> <li>.6 steering gear system</li> <li>.7 cargo-handling equipment and deck machinery</li> </ol>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> <li>.4 approved laboratory equipment training</li> </ol>	<p>The methods of preparing for 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 shutdown, and of supervising the cooling down of the engine are the most 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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Manage fuel, lubrication 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:  .1 approved in-service experience  .2 approved training ship experience  .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

**Function: Electrical, electronic and control 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
Manage operation of electrical and electronic control equipment	<p><i>Theoretical knowledge</i></p> <p>Marine electrotechnology, electronics, power electronics, automatic control engineering and safety devices</p> <p>Design features and system configurations of automatic control equipment and safety devices for the following:</p> <p>.1 main engine</p> <p>.2 generator and distribution system</p> <p>.3 steam boiler</p> <p>Design features and system configurations of operational control equipment for electrical motors</p> <p>Design features of high-voltage installations</p> <p>Features of hydraulic and pneumatic control 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>.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>
Manage trouble-shooting, restoration of electrical and electronic control equipment to operating condition	<p><i>Practical knowledge</i></p> <p>Troubleshooting of electrical and electronic control equipment</p> <p>Function test of electrical, electronic control equipment and safety devices</p> <p>Troubleshooting of monitoring systems</p> <p>Software version control</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>Maintenance activities are correctly planned in accordance with technical, legislative, safety and procedural specifications</p> <p>Inspection, testing and troubleshooting of equipment are appropriate</p>

**Function: Maintenance and repair 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
Manage safe and effective maintenance and repair procedures	<p><i>Theoretical knowledge</i></p> <p>Marine engineering practice</p> <p><i>Practical knowledge</i></p> <p>Manage safe and effective maintenance and repair procedures</p> <p>Planning maintenance, including statutory and class verifications</p> <p>Planning repairs</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>Inspection and adjustment of equipment</p> <p>Non-destructive examination</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 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>.3 approved laboratory equipment training</p>	<p>Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns</p>

**Function: Controlling the operation of the ship and care for persons on board 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
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 countermeasures 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>	<p>Stability and stress conditions are maintained within safety limits at all times</p>
Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea, security 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>.2 responsibilities under the relevant requirements of the International Convention on Load Lines, 1966, as amended</p> <p>.3 responsibilities under the relevant requirements of the International Convention for the Safety of Life at Sea, 1974, as amended</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>



Column 1	Column 2	Column 3	Column 4
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 protection of the marine environment (continued)</p>	<p>.4 responsibilities under the International Convention for the Prevention of Pollution from Ships, as amended</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>		
<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 salvage 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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Develop emergency and damage control plans and handle emergency situations	<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
Use leadership and managerial skills	<p>Knowledge of shipboard personnel management and training</p> <p>A knowledge of international maritime conventions and recommendations, and related national legislation</p> <p>Ability to apply task and workload management, including:</p> <ul style="list-style-type: none"> <li>.1 planning and coordination</li> <li>.2 personnel assignment</li> <li>.3 time and resource constraints</li> <li>.4 prioritization</li> </ul> <p>Knowledge and ability to apply effective resource management:</p> <ul style="list-style-type: none"> <li>.1 allocation, assignment, and prioritization of resources</li> <li>.2 effective communication on board and ashore</li> <li>.3 decisions reflect consideration of team experience</li> </ul>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved training</li> <li>.2 approved in-service experience</li> <li>.3 approved simulator training</li> </ul>	<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 assessment of current competence and capabilities and operational requirements</p> <p>Operations are demonstrated to be in accordance with applicable rules</p> <p>Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Use leadership and managerial skills <i>(continued)</i>	.4 assertiveness and leadership, including motivation  .5 obtaining and maintaining situation awareness  Knowledge and ability to apply decision-making techniques:  .1 situation and risk assessment  .2 identify and generate options  .3 select course of action  .4 evaluation of outcome effectiveness  Development, implementation, and oversight of standard operating procedures		Effective leadership behaviours are demonstrated  Necessary team member(s) share accurate understanding of current and predicted vessel state and operational status and external environment  Decisions are most effective for the situation  Operations are demonstrated to be effective and in accordance with applicable rules

**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 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 and the requirements of paragraphs 2.1.1 and 2.1.2 of regulation III/3 may be varied for engineer officers of ships powered by main propulsion machinery of less than 3,000 kW main 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.

**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 with 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**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
<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;</p> <p>.2 approved training ship experience; or</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, handover 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;</p> <p>.2 approved training ship experience;</p> <p>.3 practical test; or</p> <p>.4 approved simulator training, where appropriate</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>

Column 1	Column 2	Column 3	Column 4
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

**Section A-III/5**

*Mandatory minimum requirements for certification of ratings as able seafarer engine in a manned engine-room or designated to perform duties in a periodically unmanned engine-room*

**Standard of competence**

1 Every able seafarer engine serving on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more shall be required to demonstrate the competence to perform the functions at the support level, as specified in column 1 of table A-III/5.

2 The minimum knowledge, understanding and proficiency required of an able seafarer engine serving on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more is listed in column 2 of table A-III/5.

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/5.



Table A-III/5

**Specification of minimum standard of competence for ratings as able seafarer engine  
in a manned engine-room or designated to perform duties  
in a periodically unmanned engine-room**

**Function: Marine engineering at the support level**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Contribute to a safe engineering watch	Ability to understand orders and to communicate with the officer of the watch in matters relevant to watchkeeping duties  Procedures for the relief, maintenance and handover of a watch  Information required to maintain a safe watch	Assessment of evidence obtained from in-service experience or practical test	Communications are clear and concise  Maintenance, handover and relief of the watch is in conformity with acceptable practices and procedures
Contribute to the monitoring and controlling of an engine-room watch	Basic knowledge of the function and operation of main propulsion and auxiliary machinery  Basic understanding of main propulsion and auxiliary machinery control pressures, temperatures and levels	Assessment of evidence obtained from one or more of the following:  .1 approved in-service experience; .2 approved training ship experience; or .3 practical test	The frequency and extent of monitoring of main propulsion and auxiliary machinery conforms with accepted principles and procedures  Deviations from the norm are identified  Unsafe conditions or potential hazards are promptly recognized, reported and rectified before work continues
Contribute to fuelling and oil transfer operations	Knowledge of the function and operation of fuel system and oil transfer operations, including:  .1 preparations for fuelling and transfer operations  .2 procedures for connecting and disconnecting fuelling and transfer hoses	Assessment of evidence obtained from one or more of the following:  .1 approved in-service experience .2 practical training .3 examination .4 approved training ship experience	Transfer operations are carried out in accordance with established safety practices and equipment operating instructions  The handling of dangerous, hazardous and harmful liquids complies with established safety practices  Communications within the operator's area of responsibility are consistently successful

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Contribute to fuelling and oil transfer operations ( <i>continued</i> )	<p>.3 procedures relating to incidents that may arise during fuelling or transferring operation</p> <p>.4 securing from fuelling and transfer operations</p> <p>.5 ability to correctly measure and report tank levels</p>	Assessment of evidence obtained from practical demonstration	
Contribute to bilge and ballast operations	<p>Knowledge of the safe function, operation and maintenance of the bilge and ballast systems, including:</p> <p>.1 reporting incidents associated with transfer operations</p> <p>.2 ability to correctly measure and report tank levels</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 practical training</p> <p>.3 examination</p> <p>.4 approved training ship experience</p> <p>Assessment of evidence obtained from practical demonstration</p>	<p>Operations and maintenance are carried out in accordance with established safety practices and equipment operating instructions and pollution of the marine environment is avoided</p> <p>Communications within the operator's area of responsibility are consistently successful</p>
Contribute to the operation of equipment and machinery	<p>Safe operation of equipment, including:</p> <p>.1 valves and pumps</p> <p>.2 hoists and lifting equipment</p> <p>.3 hatches, watertight doors, ports and related equipment</p> <p>Ability to use and understand basic crane, winch and hoist signals</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 practical training</p> <p>.3 examination</p> <p>.4 approved training ship experience</p> <p>Assessment of evidence obtained from practical demonstration</p>	<p>Operations are carried out in accordance with established safety practices and equipment operating instructions</p> <p>Communications within the operator's area of responsibility are consistently successful</p>

**Function: Electrical, electronic and control 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
Safe use of electrical equipment	<p>Safe use and operation of electrical equipment, including:</p> <ul style="list-style-type: none"> <li>.1 safety precautions before commencing work or repair</li> <li>.2 isolation procedures</li> <li>.3 emergency procedures</li> <li>.4 different voltages on board</li> </ul> <p>Knowledge of the causes of electric shock and precautions to be observed to prevent shock</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 practical training</li> <li>.3 examination</li> <li>.4 approved training ship experience</li> </ul>	<p>Recognizes and reports electrical hazards and unsafe equipment</p> <p>Understands safe voltages for hand-held equipment</p> <p>Understands risks associated with high-voltage equipment and onboard work</p>

**Function: Maintenance and repair 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
Contribute to shipboard maintenance and repair	<p>Ability to use painting, lubrication and cleaning materials and equipment</p> <p>Ability to understand and execute routine maintenance and repair procedures</p> <p>Knowledge of surface preparation techniques</p> <p>Knowledge of safe disposal of waste materials</p> <p>Understanding manufacturer's safety guidelines and shipboard instructions</p>	<p>Assessment of evidence obtained from practical demonstration</p> <p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 practical training</li> <li>.3 examination</li> <li>.4 approved training ship experience</li> </ul>	<p>Maintenance activities are carried out in accordance with technical, safety and procedural specifications</p> <p>Selection and use of equipment and tools is appropriate</p>

Column 1	Column 2	Column 3	Column 4
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Contribute to shipboard maintenance and repair ( <i>continued</i> )	Knowledge of the application, maintenance and use of hand and power tools and measuring instruments and machine tools  Knowledge of metalwork		

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

Column 1	Column 2	Column 3	Column 4
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Contribute to the handling of stores	Knowledge of procedures for safe handling, stowage and securing of stores	Assessment of evidence obtained from one or more of the following:  .1 approved in-service experience  .2 practical training  .3 examination  .4 approved training ship experience	Stores operations are carried out in accordance with established safety practices and equipment operating instructions  The handling of dangerous, hazardous and harmful stores complies with established safety practices  Communications within the operator's area of responsibility are consistently successful
Apply precautions and contribute to the prevention of pollution of the marine environment	Knowledge of the precautions to be taken to prevent pollution of the marine environment  Knowledge of use and operation of anti-pollution equipment  Knowledge of approved methods for disposal of marine pollutants	Assessment of evidence obtained from one or more of the following:  .1 approved in-service experience  .2 practical training  .3 examination  .4 approved training ship experience	Procedures designed to safeguard the marine environment are observed at all times

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Apply occupational health and safety procedures	Working knowledge of safe working practices and personal shipboard safety, including: .1 electrical safety .2 lockout/tag-out .3 mechanical safety .4 permit to work systems .5 working aloft .6 working in enclosed spaces .7 lifting techniques and methods of preventing back injury .8 chemical and biohazard safety .9 personal safety equipment	Assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 practical training .3 examination .4 approved training ship experience	Procedures designed to safeguard personnel and the ship are observed at all times  Safe working practices are observed and appropriate safety and protective equipment is correctly used at all times

**Section A-III/6***Mandatory minimum requirements for certification of electro-technical officers***Training**

1 The education and training required by paragraph 2.3 of regulation III/6 shall include training in electronic and electrical workshop skills relevant to the duties of electro-technical officer.

**Onboard training**

2 Every candidate for certification as electro-technical officer shall follow an approved programme of onboard 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 electro-technical officer;
- .2 is closely supervised and monitored by qualified and certificated officers 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 electro-technical officer shall be required to demonstrate the ability to undertake the tasks, duties and responsibilities listed in column 1 of table A-III/6.

4 The minimum knowledge, understanding and proficiency required for certification is listed in column 2 of table A-III/6 and it shall take into account 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 tabulated in columns 3 and 4 of table A-III/6.

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Table A-III/6

**Specification of minimum standard of competence for electro-technical officers**

**Function: Electrical, electronic and control 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
<p>Monitor the operation of electrical, electronic and control systems</p>	<p>Basic understanding of the operation of mechanical engineering systems, including:</p> <ul style="list-style-type: none"> <li>.1 prime movers, including main propulsion plant</li> <li>.2 engine-room auxiliary machinery</li> <li>.3 steering systems</li> <li>.4 cargo handling systems</li> <li>.5 deck machinery</li> <li>.6 hotel systems</li> </ul> <p>Basic knowledge of heat transmission, mechanics and hydromechanics</p> <p><i>Knowledge of:</i></p> <p>Electro-technology and electrical machines theory</p> <p>Fundamentals of electronics and power electronics</p> <p>Electrical power distribution boards and electrical equipment</p> <p>Fundamentals of automation, automatic control systems and technology</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> <li>.4 approved laboratory equipment training</li> </ul>	<p>Operation of equipment and system is in accordance with operating manuals</p> <p>Performance levels are in accordance with technical specifications</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Monitor the operation of electrical, electronic and control systems (continued)	Instrumentation, alarm and monitoring systems  Electrical drives  Technology of electrical materials  Electro-hydraulic and electro-pneumatic control systems  Appreciation of the hazards and precautions required for the operation of power systems above 1,000 volts		
Monitor the operation of automatic control systems of propulsion and auxiliary machinery	Preparation of control systems of propulsion and auxiliary machinery for operation	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	Surveillance of main propulsion plant and auxiliary systems is sufficient to maintain safe operation condition
Operate generators and distribution systems	Coupling, load sharing and changing over generators  Coupling and breaking connection between switchboards and distribution panels	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 operating manuals, established rules and procedures to ensure safety of operations  Electrical distribution systems can be understood and explained with drawings/instructions



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Operate and maintain power systems in excess of 1,000 volts	<p><i>Theoretical knowledge</i></p> <p>High-voltage technology</p> <p>Safety precautions and procedures</p> <p>Electrical propulsion of the ships, electrical motors and control systems</p> <p><i>Practical knowledge</i></p> <p>Safe operation and maintenance of high-voltage systems, including knowledge of the special technical type of high-voltage systems and the danger resulting from operational voltage of more than 1,000 volts</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>Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations</p>
Operate computers and computer networks on ships	<p>Understanding of:</p> <p>.1 main features of data processing</p> <p>.2 construction and use of computer networks on ships</p> <p>.3 bridge-based, engine-room-based and commercial computer use</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>Computer networks and computers are correctly checked and handled</p>
Use English in written and oral form	<p>Adequate knowledge of the English language to enable the officer to use engineering publications and to perform the officer's duties</p>	<p>Examination and assessment of evidence obtained from practical instructions</p>	<p>English language publications relevant to the officer's duties are correctly interpreted</p> <p>Communications are clear and understood</p>

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
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:  .1 approved in-service experience  .2 approved training ship experience  .3 approved simulator training, where appropriate  .4 approved laboratory equipment training	Transmission and reception of messages are consistently successful  Communication records are complete, accurate and comply with statutory requirements

**Function: Maintenance and repair 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>Maintenance and repair of electrical and electronic equipment</p>	<p>Safety requirements for working on shipboard electrical systems, including the safe isolation of electrical equipment required before personnel are permitted to work on such equipment</p> <p>Maintenance and repair of electrical system equipment, switchboards, electric motors, generators and DC electrical systems and equipment</p> <p>Detection of electric malfunction, location of faults and measures to prevent damage</p> <p>Construction and operation of electrical testing and measuring equipment</p> <p>Function and performance tests of the following equipment and their configuration:</p> <p>.1 monitoring systems</p> <p>.2 automatic control devices</p> <p>.3 protective devices</p> <p>The interpretation of electrical and electronic diagrams</p>	<p>Examination and 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>.3 approved in-service experience</p> <p>.4 approved training ship experience</p>	<p>Safety measures for working are appropriate</p> <p>Selection and use of hand tools, measuring instruments, and testing equipment are appropriate and interpretation of results is accurate</p> <p>Dismantling, inspecting, repairing and reassembling equipment are in accordance with manuals and good practice</p> <p>Reassembling and performance testing is in accordance with manuals and good practice</p>
<p>Maintenance and repair of automation and control systems of main propulsion and auxiliary machinery</p>	<p>Appropriate electrical and mechanical knowledge and skills</p> <p><i>Safety and emergency procedures</i></p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>Safe isolation of equipment and associated systems required before personnel are permitted to work on such plant or equipment</p> <p>Practical knowledge for the testing, maintenance, fault finding and repair</p> <p>Test, detect faults and maintain and restore electrical and electronic control equipment to operating condition</p>	<p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p>	<p>Isolation, dismantling and reassembly of plant and equipment are in accordance with manufacturer's safety guidelines and shipboard instructions and legislative and safety specifications. Action taken leads to the restoration of automation and control systems by the method most suitable and appropriate to the prevailing circumstances and conditions</p>
<p>Maintenance and repair of bridge navigation equipment and ship communication systems</p>	<p>Knowledge of the principles and maintenance procedures of navigation equipment, internal and external communication systems</p> <p><i>Theoretical knowledge:</i></p> <p>Electrical and electronic systems operating in flammable areas</p> <p><i>Practical knowledge:</i></p> <p>Carrying out safe maintenance and repair procedures</p> <p>Detection of machinery malfunction, location of faults and action to prevent damage</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> <p>Isolation, dismantling and re-assembly of plant and equipment are in accordance with manufacturer's safety guidelines and shipboard instructions, legislative and safety specifications. Action taken leads to the restoration of bridge navigation equipment and ship communication systems by the method most suitable and appropriate to the prevailing circumstances and conditions</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintenance and repair of electrical, electronic and control systems of deck machinery and cargo-handling equipment</p>	<p>Appropriate electrical and mechanical knowledge and skills</p> <p><i>Safety and emergency procedures</i></p> <p>Safe isolation of equipment and associated systems required before personnel are permitted to work on such plant or equipment</p> <p>Practical knowledge for the testing, maintenance, fault finding and repair</p> <p>Test, detect faults and maintain and restore electrical and electronic control equipment to operating condition</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 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> <p>Isolation, dismantling and re-assembly of plant and equipment are in accordance with manufacturer's safety guidelines and shipboard instructions, legislative and safety specifications. Action taken leads to the restoration of deck machinery and cargo-handling equipment by the method most suitable and appropriate to the prevailing circumstances and conditions</p>
<p>Maintenance and repair of control and safety systems of hotel equipment</p>	<p><i>Theoretical knowledge:</i></p> <p>Electrical and electronic systems operating in flammable areas</p> <p><i>Practical knowledge:</i></p> <p>Carrying out safe maintenance and repair procedures</p> <p>Detection of machinery malfunction, location of faults and action to prevent damage</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> <p>Isolation, dismantling and re-assembly of plant and equipment are in accordance with manufacturer's safety guidelines and shipboard instructions, legislative and safety specifications. Action taken leads to the restoration of control and safety systems of hotel equipment by the method most suitable and appropriate to the prevailing circumstances and conditions</p>

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

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Ensure compliance with pollution-prevention requirements	<p><i>Prevention of pollution of the marine environment</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>Importance of proactive measures to protect the marine environment</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 training</p>	<p>Procedures for monitoring shipboard operations and ensuring compliance with pollution-prevention requirements are fully observed</p> <p>Actions to ensure that a positive environmental reputation is maintained</p>
Prevent, control and fight fire on board	<p><i>Fire prevention and fire-fighting appliances</i></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>	<p>Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3, paragraphs 1 to 3</p>	<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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
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>	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
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
Application of leadership and teamworking skills	<p>Working knowledge of shipboard personnel management and training</p> <p>Ability to apply task and workload management, including:</p> <ul style="list-style-type: none"> <li>.1 planning and co-ordination</li> <li>.2 personnel assignment</li> <li>.3 time and resource constraints</li> <li>.4 prioritization</li> </ul>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved training</li> <li>.2 approved in-service experience</li> <li>.3 practical demonstration</li> </ul>	<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 assessment of current competence and capabilities and operational requirements</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Application of leadership and teamworking skills <i>(continued)</i>	<p>Knowledge and ability to apply effective resource management:</p> <ol style="list-style-type: none"> <li>.1 allocation, assignment, and prioritization of resources</li> <li>.2 effective communication on board and ashore</li> <li>.3 decisions reflect consideration of team experiences</li> <li>4 assertiveness and leadership, including motivation</li> <li>.5 obtaining and maintaining situational awareness</li> </ol> <p>Knowledge and ability to apply decision-making techniques:</p> <ol style="list-style-type: none"> <li>.1 Situation and risk assessment</li> <li>.2 Identify and consider generated options</li> <li>.3 Selecting course of action</li> <li>.4 Evaluation of outcome effectiveness</li> </ol>		<p>Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Effective leadership behaviours are demonstrated</p> <p>Necessary team member(s) share accurate understanding of current and predicted vessel state and operational status and external environment</p> <p>Decisions are most effective for the situation</p>
Contribute to the safety of personnel and ship	<p>Knowledge of personal survival techniques</p> <p>Knowledge of fire prevention and ability to fight and extinguish fires</p> <p>Knowledge of elementary first aid</p> <p>Knowledge of personal safety and social responsibilities</p>	Assessment of evidence obtained from approved training and experience as set out in section A-VI/1, paragraph 2	<p>Appropriate safety and protective equipment is correctly used</p> <p>Procedures and safe working practices designed to safeguard personnel and the ship are observed at all times</p> <p>Procedures designed to safeguard the environment are observed at all times</p> <p>Initial and follow-up actions on becoming aware of an emergency conform with established emergency response procedures</p>



**Section A-III/7**

*Mandatory minimum requirements for certification of electro-technical rating*

**Standard of Competence**

- 1 Every electro-technical rating serving on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more shall be required to demonstrate the competence to perform the functions at the support level, as specified in column 1 of table A-III/7.
- 2 The minimum knowledge, understanding and proficiency required of an electro-technical rating serving on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more is listed in column 2 of table A-III/7.
- 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/7.

Table A-III/7

**Specification of minimum standard of competence for electro-technical ratings****Function: Electrical, electronic and control 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
Safe use of electrical equipment	<p>Safe use and operation of electrical equipment, including:</p> <ul style="list-style-type: none"> <li>.1 safety precautions before commencing work or repair</li> <li>.2 isolation procedures</li> <li>.3 emergency procedures</li> <li>.4 different voltages on board</li> </ul> <p>Knowledge of the causes of electric shock and precautions to be observed to prevent shock</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 practical training</li> <li>.3 examination</li> <li>.4 approved training ship experience</li> </ul>	<p>Understands and follows safety instructions of electrical equipment and machinery</p> <p>Recognizes and reports electrical hazards and unsafe equipment</p> <p>Understands safe voltages for hand-held equipment</p> <p>Understands risks associated with high-voltage equipment and onboard work</p>
Contribute to monitoring the operation of electrical systems and machinery	<p>Basic knowledge of the operation of mechanical engineering systems, including:</p> <ul style="list-style-type: none"> <li>.1 prime movers, including main propulsion plant</li> <li>.2 engine-room auxiliary machineries</li> <li>.3 steering systems</li> <li>.4 cargo-handling systems</li> <li>.5 deck machineries</li> <li>.6 hotel systems</li> </ul>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 practical training</li> <li>.3 examination</li> <li>.4 approved training ship experience</li> </ul>	<p>Knowledge that ensures:</p> <ul style="list-style-type: none"> <li>.1 operation of equipment and system is in accordance with operating manuals</li> <li>.2 performance levels are in accordance with technical specifications</li> </ul>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Contribute to monitoring the operation of electrical systems and machinery <i>(continued)</i>	<i>Basic knowledge of:</i> <ol style="list-style-type: none"> <li>.1 electro-technology and electrical machines theory</li> <li>.2 electrical power distribution boards and electrical equipment</li> <li>.3 fundamentals of automation, automatic control systems and technology</li> <li>.4 instrumentation, alarm and monitoring systems</li> <li>.5 electrical drives</li> <li>.6 electro-hydraulic and electro-pneumatic control systems</li> <li>.7 coupling, load sharing and changes in electrical configuration</li> </ol>		
Use hand tools, electrical and electronic measurement equipment for fault finding, maintenance and repair operations	Safety requirements for working on shipboard electrical systems  Application of safe working practices  <i>Basic knowledge of:</i> <ol style="list-style-type: none"> <li>.1 construction and operational characteristics of shipboard AC and DC systems and equipment</li> <li>.2 use of measuring instruments, machine tools, and hand and power tools</li> </ol>	Assessment of evidence obtained from one or more of the following: <ol style="list-style-type: none"> <li>.1 approved workshop skills training</li> <li>.2 approved practical experience and tests</li> </ol>	Implementation of safety procedures is satisfactory  Selection and use of test equipment is appropriate and interpretation of results is accurate  Selection of procedures for the conduct of repair and maintenance is in accordance with manuals and good practice

**Function: Maintenance and repair 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
Contribute to shipboard maintenance and repair	<p>Ability to use lubrication and cleaning materials and equipment</p> <p>Knowledge of safe disposal of waste materials</p> <p>Ability to understand and execute routine maintenance and repair procedures</p> <p>Understanding manufacturer's safety guidelines and shipboard instructions</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 practical training</p> <p>.3 examination</p> <p>.4 approved training ship experience</p>	<p>Maintenance activities are carried out in accordance with technical, safety and procedural specifications</p> <p>Selection and use of equipment and tools is appropriate</p>
Contribute to the maintenance and repair of electrical systems and machinery on board	<p><i>Safety and emergency procedures</i></p> <p>Basic knowledge of electro-technical drawings and safe isolation of equipment and associated systems required before personnel are permitted to work on such plant or equipment</p> <p>Test, detect faults and maintain and restore electrical control equipment and machinery to operating condition</p> <p>Electrical and electronic equipment operating in flammable areas</p> <p>Basics of ship's fire-detection system</p> <p>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 simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</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> <p>Isolation, dismantling and reassembly of plant and equipment is in accordance with manufacturer's safety guidelines and shipboard instructions</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Contribute to the maintenance and repair of electrical systems and machinery on board (continued)	Detection of machinery malfunction, location of faults and action to prevent damage  Maintenance and repair of lighting fixtures and supply systems		

**Function: Controlling the operation of the ship and care for persons on board 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
Contribute to the handling of stores	Knowledge of procedures for safe handling, stowage and securing of stores	Assessment of evidence obtained from one or more of the following:  .1 approved in-service experience  .2 practical training  .3 examination  .4 approved training ship experience	Stores stowage operations are carried out in accordance with established safety practices and equipment operating instructions  The handling of dangerous, hazardous and harmful stores complies with established safety practices  Communications within the operator's area of responsibility are consistently successful
Apply precautions and contribute to the prevention of pollution of the marine environment	Knowledge of the precautions to be taken to prevent pollution of the marine environment  Knowledge of use and operation of anti-pollution equipment/agents  Knowledge of approved methods for disposal of marine pollutants	Assessment of evidence obtained from one or more of the following:  .1 approved in-service experience  .2 practical training  .3 examination  .4 approved training ship experience	Procedures designed to safeguard the marine environment are observed at all times

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Apply occupational health and safety procedures	<p>Working knowledge of safe working practices and personal shipboard safety, including:</p> <ul style="list-style-type: none"> <li>.1 electrical safety</li> <li>.2 lockout/tag-out</li> <li>.3 mechanical safety</li> <li>.4 permit to work systems</li> <li>.5 working aloft</li> <li>.6 working in enclosed spaces</li> <li>.7 lifting techniques and methods of preventing back injury</li> <li>.8 chemical and biohazard safety</li> <li>.9 personal safety equipment</li> </ul>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 practical training</li> <li>.3 examination</li> <li>.4 approved training ship experience</li> </ul>	<p>Procedures designed to safeguard personnel and the ship are observed at all times</p> <p>Safe working practices are observed and appropriate safety and protective equipment is correctly used at all times</p>

## CHAPTER IV

### Standards regarding radio operators

#### Section A-IV/1

##### *Application*

(No provisions)

#### Section A-IV/2

##### *Mandatory minimum requirements for certification of GMDSS radio operators*

#### Standard of competence

1 The minimum knowledge, understanding and proficiency required for certification of GMDSS radio operators shall be sufficient for radio operators 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 of competency 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.

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\* The relevant IMO Model Course(s) 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>In addition to the requirements of the Radio Regulations, a knowledge of:</p> <ul style="list-style-type: none"> <li>.1 search and rescue radiocommunications, including procedures in the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual</li> <li>.2 the means to prevent the transmission of false distress alerts and the procedures to mitigate the effects of such alerts</li> <li>.3 ship reporting systems</li> <li>.4 radio medical services</li> <li>.5 use of the International Code of Signals and the IMO Standard Marine Communication Phrases</li> <li>.6 the English language, both written and spoken, for the communication of information relevant to safety of life at sea</li> </ul> <p><i>Note:</i> This requirement may be reduced in the case of the Restricted Radio Operator's Certificate</p>	<p>Examination and assessment of evidence obtained from practical demonstration of operational procedures, using:</p> <ul style="list-style-type: none"> <li>.1 approved equipment</li> <li>.2 GMDSS communication simulator, where appropriate*</li> <li>.3 radiocommunication laboratory equipment</li> </ul>	<p>Transmission and reception of communications comply with international regulations and procedures and are carried out efficiently and effectively</p> <p>English language messages relevant to the safety of the ship, security and persons on board and protection of the marine environment are correctly handled</p>

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\* See paragraph 72 of section B-I/12 of this Code.



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Provide radio services in emergencies	<p>The provision of radio services in emergencies such as:</p> <ul style="list-style-type: none"> <li>.1 abandon ship</li> <li>.2 fire on board ship</li> <li>.3 partial or full breakdown of radio installations</li> </ul> <p>Preventive measures for the safety of ship and personnel in connection with hazards related to radio equipment, including electrical and non-ionizing radiation hazards</p>	<p>Examination and assessment of evidence obtained from practical demonstration of operational procedures, using:</p> <ul style="list-style-type: none"> <li>.1 approved equipment</li> <li>.2 GMDSS communication simulator, where appropriate*</li> <li>.3 radiocommunication laboratory equipment</li> </ul>	<p>Response is carried out efficiently and effectively</p>

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\* See paragraph 72 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/1-1**

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

**Standard of competence**

1 Every candidate for certification in basic training for oil and chemical tanker cargo operations shall be required to:

- .1 demonstrate the competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-V/1-1-1; and
- .2 provide evidence of having achieved:
  - .2.1 the minimum knowledge, understanding and proficiency listed in column 2 of table A-V/1-1-1, and
  - .2.2 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-V/1-1-1.

2 Every candidate for certification in advanced training for oil tanker cargo operations shall be required to:

- .1 demonstrate the competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-V/1-1-2; and
- .2 provide evidence of having achieved:
  - .2.1 the minimum knowledge, understanding and proficiency listed in column 2 of table A-V/1-1-2, and
  - .2.2 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-V/1-1-2.

3 Every candidate for certification in advanced training for chemical tanker cargo operations shall be required to:

- .1 demonstrate the competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-V/1-1-3; and

- .2 provide evidence of having achieved:
  - .2.1 the minimum knowledge, understanding and proficiency listed in column 2 of table A-V/1-1-3, and
  - .2.2 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-V/1-1-3.

*Table A-V/1-1-1*  
**Specification of minimum standard of competence in basic training  
for oil and chemical tanker cargo operations**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Contribute to the safe cargo operation of oil and chemical tankers	<p>Basic knowledge of tankers:</p> <ul style="list-style-type: none"> <li>.1 types of oil and chemical tankers</li> <li>.2 general arrangement and construction</li> </ul> <p>Basic knowledge of cargo operations:</p> <ul style="list-style-type: none"> <li>.1 piping systems and valves</li> <li>.2 cargo pumps</li> <li>.3 loading and unloading</li> <li>.4 tank cleaning, purging, gas-freeing and inerting</li> </ul> <p>Basic knowledge of the physical properties of oil and chemicals:</p> <ul style="list-style-type: none"> <li>.1 pressure and temperature, including vapour pressure/temperature relationship</li> <li>.2 types of electrostatic charge generation</li> <li>.3 chemical symbols</li> </ul> <p>Knowledge and understanding of tanker safety culture and safety management</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Communications within the area of responsibility are clear and effective</p> <p>Cargo operations are carried out in accordance with accepted principles and procedures to ensure safety of operations</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Take precautions to prevent hazards</p>	<p>Basic knowledge of the hazards associated with tanker operations, including:</p> <ul style="list-style-type: none"> <li>.1 health hazards</li> <li>.2 environmental hazards</li> <li>.3 reactivity hazards</li> <li>.4 corrosion hazards</li> <li>.5 explosion and flammability hazards</li> <li>.6 sources of ignition, including electrostatic hazards</li> <li>.7 toxicity hazards</li> <li>.8 vapour leaks and clouds</li> </ul> <p>Basic knowledge of hazard controls:</p> <ul style="list-style-type: none"> <li>.1 inerting, water padding, drying agents and monitoring techniques</li> <li>.2 anti-static measures</li> <li>.3 ventilation</li> <li>.4 segregation</li> <li>.5 cargo inhibition</li> <li>.6 importance of cargo compatibility</li> <li>.7 atmospheric control</li> <li>.8 gas testing</li> </ul> <p>Understanding of information on a Material Safety Data Sheet (MSDS)</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Correctly identifies, on an MSDS, relevant cargo-related hazards to the vessel and to personnel, and takes the appropriate actions in accordance with established procedures</p> <p>Identification and actions on becoming aware of a hazardous situation conform to established procedures in line with best practice</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Apply occupational health and safety precautions and measures	<p>Function and proper use of gas-measuring instruments and similar equipment</p> <p>Proper use of safety equipment and protective devices, including:</p> <ul style="list-style-type: none"> <li>.1 breathing apparatus and tank-evacuating equipment</li> <li>.2 protective clothing and equipment</li> <li>.3 resuscitators</li> <li>.4 rescue and escape equipment</li> </ul> <p>Basic knowledge of safe working practices and procedures in accordance with legislation and industry guidelines and personal shipboard safety relevant to oil and chemical tankers, including:</p> <ul style="list-style-type: none"> <li>.1 precautions to be taken when entering enclosed spaces</li> <li>.2 precautions to be taken before and during repair and maintenance work</li> <li>.3 safety measures for hot and cold work</li> <li>.4 electrical safety</li> <li>.5 ship/shore safety checklist</li> </ul> <p>Basic knowledge of first aid with reference to a Material Safety Data Sheet (MSDS)</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Procedures for entry into enclosed spaces are observed.</p> <p>Procedures and safe working practices designed to safeguard personnel and the ship are observed at all times</p> <p>Appropriate safety and protective equipment is correctly used</p> <p>First aid do's and don'ts</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Carry out fire-fighting operations	<p>Tanker fire response organization and action to be taken</p> <p>Fire hazards associated with cargo handling and transportation of hazardous and noxious liquids in bulk</p> <p>Fire-fighting agents used to extinguish oil and chemical fires</p> <p>Fixed fire-fighting foam system operations</p> <p>Portable fire-fighting foam operations</p> <p>Fixed dry chemical system operations</p> <p>Spill containment in relation to fire-fighting operations</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>Initial actions and follow-up actions on becoming aware of fire on board conform with established practices and procedures</p> <p>Action taken on identifying muster signal is appropriate to the indicated emergency and complies with established procedures</p> <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>
Respond to emergencies	<p>Basic knowledge of emergency procedures, including emergency shutdown</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>The type and impact of the emergency is promptly identified and the response actions conform to the emergency procedures and contingency plans</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Take precautions to prevent pollution of the environment from the release of oil or chemicals</p>	<p>Basic knowledge of the effects of oil and chemical pollution on human and marine life</p> <p>Basic knowledge of shipboard procedures to prevent pollution</p> <p>Basic knowledge of measures to be taken in the event of spillage, including the need to:</p> <ul style="list-style-type: none"> <li>.1 report relevant information to the responsible persons</li> <li>.2 assist in implementing shipboard spill-containment procedures</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Procedures designed to safeguard the environment are observed at all times</p>



*Table A-V/1-1-2*  
**Specification of minimum standard of competence in advanced training  
for oil tanker cargo operations**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Ability to safely perform and monitor all cargo operations	<p><i>Design and characteristics of an oil tanker</i></p> <p>Knowledge of oil tanker design, systems and equipment, including:</p> <ul style="list-style-type: none"> <li>.1 general arrangement and construction</li> <li>.2 pumping arrangement and equipment</li> <li>.3 tank arrangement, pipeline system and tank venting arrangement</li> <li>.4 gauging systems and alarms</li> <li>.5 cargo heating systems</li> <li>.6 tank cleaning, gas-freeing and inerting systems</li> <li>.7 ballast system</li> <li>.8 cargo area venting and accommodation ventilation</li> <li>.9 slop arrangements</li> <li>.10 vapour recovery systems</li> <li>.11 cargo-related electrical and electronic control system</li> <li>.12 environmental protection equipment, including Oil Discharge Monitoring Equipment (ODME)</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Communications are clear, understood and successful</p> <p>Cargo operations are carried out in a safe manner, taking into account oil tanker designs, systems and equipment</p> <p>Cargo operations are planned, risk is managed and carried out in accordance with accepted principles and procedures to ensure safety of operations and avoid pollution of the marine environment</p> <p>Potential non-compliance with cargo-operation-related procedures is promptly identified and rectified</p> <p>Proper loading, stowage and unloading of cargoes ensures that stability and stress conditions remain within safe limits at all times</p> <p>Actions taken and procedures followed are correctly applied and the appropriate shipboard cargo-related equipment is properly used</p> <p>Calibration and use of monitoring and gas-detection equipment comply with operational practices and procedures</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Ability to safely perform and monitor all cargo operations (<i>continued</i>)</p>	<p>.13 tank coating</p> <p>.14 tank temperature and pressure control systems</p> <p>.15 fire-fighting systems</p> <p>Knowledge of pump theory and characteristics, including types of cargo pumps and their safe operation</p> <p>Proficiency in tanker safety culture and implementation of safety-management system</p> <p>Knowledge and understanding of monitoring and safety systems, including the emergency shutdown</p> <p><i>Loading, unloading, care and handling of cargo</i></p> <p>Ability to perform cargo measurements and calculations</p> <p>Knowledge of the effect of bulk liquid cargoes on trim, stability and structural integrity</p> <p>Knowledge and understanding of oil cargo-related operations, including:</p> <p>.1 loading and unloading plans</p> <p>.2 ballasting and deballasting</p> <p>.3 tank cleaning operations</p> <p>.4 inerting</p> <p>.5 gas-freeing</p>		<p>Procedures for monitoring and safety systems ensure that all alarms are detected promptly and acted upon in accordance with established emergency procedures</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Ability to safely perform and monitor all cargo operations <i>(continued)</i></p>	<p>.6 ship-to-ship transfers .7 load on top .8 crude oil washing</p> <p>Development and application of cargo-related operation plans, procedures and checklists</p> <p>Ability to calibrate and use monitoring and gas-detection systems, instruments and equipment</p> <p>Ability to manage and supervise personnel with cargo-related responsibilities</p>		<p>Personnel are allocated duties and informed of procedures and standards of work to be followed, in a manner appropriate to the individuals concerned and in accordance with safe operational practices</p>
<p>Familiarity with physical and chemical properties of oil cargoes</p>	<p>Knowledge and understanding of the physical and chemical properties of oil cargoes</p> <p>Understanding the information contained in a Material Safety Data Sheet (MSDS)</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 .4 approved training programme</p>	<p>Effective use is made of information resources for identification of properties and characteristics of oil cargoes and related gases, and their impact on safety, the environment and vessel operation</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Take precautions to prevent hazards	<p>Knowledge and understanding of the hazards and control measures associated with oil tanker cargo operations, including:</p> <ul style="list-style-type: none"> <li>.1 toxicity</li> <li>.2 flammability and explosion</li> <li>.3 health hazards</li> <li>.4 inert gas composition</li> <li>.5 electrostatic hazards</li> </ul> <p>Knowledge and understanding of dangers of non-compliance with relevant rules/regulations</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Relevant cargo-related hazards to the vessel and to personnel associated with oil tanker cargo operations are correctly identified, and proper control measures are taken</p>
Apply occupational health and safety precautions	<p>Knowledge and understanding of safe working practices, including risk assessment and personal shipboard safety relevant to oil tankers:</p> <ul style="list-style-type: none"> <li>.1 precautions to be taken when entering enclosed spaces, including correct use of different types of breathing apparatus</li> <li>.2 precautions to be taken before and during repair and maintenance work</li> <li>.3 precautions for hot and cold work</li> <li>.4 precautions for electrical safety</li> <li>.5 use of appropriate Personal Protective Equipment (PPE)</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Procedures designed to safeguard personnel and the ship are observed at all times</p> <p>Safe working practices are observed and appropriate safety and protective equipment is correctly used</p> <p>Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns</p> <p>Correct use of breathing apparatus</p> <p>Procedures for entry into enclosed spaces are observed</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Respond to emergencies	<p>Knowledge and understanding of oil tanker emergency procedures, including:</p> <ul style="list-style-type: none"> <li>.1 ship emergency response plans</li> <li>.2 cargo operations emergency shutdown</li> <li>.3 actions to be taken in the event of failure of systems or services essential to cargo</li> <li>.4 fire-fighting on oil tankers</li> <li>.5 enclosed space rescue</li> <li>.6 use of a Material Safety Data Sheet (MSDS)</li> </ul> <p>Actions to be taken following collision, grounding, or spillage</p> <p>Knowledge of medical first aid procedures on board oil tankers</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>The type and impact of the emergency is promptly identified and the response actions conform with established emergency procedures and contingency plans</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> <p>Evacuation, emergency shutdown and isolation procedures are appropriate to the nature of the emergency and are implemented promptly</p> <p>The identification of and actions taken in a medical emergency conform to current recognized first aid practice and international guidelines</p>
Take precautions to prevent pollution of the environment	<p>Understanding of procedures to prevent pollution of the atmosphere and the environment</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Operations are conducted in accordance with accepted principles and procedures to prevent pollution of the environment</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Monitor and control compliance with legislative requirements	Knowledge and understanding of relevant provisions of the International Convention for the Prevention of Pollution from Ships (MARPOL), as amended, and other relevant IMO instruments, industry guidelines and port regulations as commonly applied	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	The handling of cargoes complies with relevant IMO instruments and established industrial standards and codes of safe working practice

*Table A-V/1-1-3*  
**Specification of minimum standard of competence in advanced training  
for chemical tanker cargo operations**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Ability to safely perform and monitor all cargo operations	<p><i>Design and characteristics of a chemical tanker</i></p> <p>Knowledge of chemical tanker designs, systems, and equipment, including:</p> <ul style="list-style-type: none"> <li>.1 general arrangement and construction</li> <li>.2 pumping arrangement and equipment</li> <li>.3 tank construction and arrangement</li> <li>.4 pipeline and drainage systems</li> <li>.5 tank and cargo pipeline pressure and temperature control systems and alarms</li> <li>.6 gauging control systems and alarms</li> <li>.7 gas-detecting systems</li> <li>.8 cargo heating and cooling systems</li> <li>.9 tank cleaning systems</li> <li>.10 cargo tank environmental control systems</li> <li>.11 ballast systems</li> <li>.12 cargo area venting and accommodation ventilation</li> <li>.13 vapour return/recovery systems</li> <li>.14 fire-fighting systems</li> </ul>	Examination and assessment of evidence obtained from one or more of the following: <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Communications are clear, understood and successful</p> <p>Cargo operations are carried out in a safe manner, taking into account chemical tanker designs, systems and equipment</p> <p>Cargo operations are planned, risk is managed and carried out in accordance with accepted principles and procedures to ensure safety of operations and avoid pollution of the marine environment</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Ability to safely perform and monitor all cargo operations (<i>continued</i>)</p>	<p>.15 tank, pipeline and fittings' material and coatings</p> <p>.16 slop management</p> <p>Knowledge of pump theory and characteristics, including types of cargo pumps and their safe operation</p> <p>Proficiency in tanker safety culture and implementation of safety management system</p> <p>Knowledge and understanding of monitoring and safety systems, including the emergency shutdown system</p> <p><i>Loading, unloading, care and handling of cargo</i></p> <p>Ability to perform cargo measurements and calculations</p> <p>Knowledge of the effect of bulk liquid cargoes on trim and stability and structural integrity</p> <p>Knowledge and understanding of chemical cargo-related operations, including:</p> <p>.1 loading and unloading plans</p> <p>.2 ballasting and deballasting</p> <p>.3 tank cleaning operations</p> <p>.4 tank atmosphere control</p>		<p>Procedures for monitoring and safety systems ensure that all alarms are detected promptly and acted upon in accordance with established procedures</p> <p>Proper loading, stowage and unloading of cargoes ensures that stability and stress conditions remain within safe limits at all times</p> <p>Potential non-compliance with cargo-related procedures is promptly identified and rectified</p> <p>Actions taken and procedures followed are correctly identified and appropriate shipboard cargo-related equipment is properly used</p>



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Ability to safely perform and monitor all cargo operations (continued)</p>	<p>.5 inerting</p> <p>.6 gas-freeing</p> <p>.7 ship-to-ship transfers</p> <p>.8 inhibition and stabilization requirements</p> <p>.9 heating and cooling requirements and consequences to adjacent cargoes</p> <p>.10 cargo compatibility and segregation</p> <p>.11 high-viscosity cargoes</p> <p>.12 cargo residue operations</p> <p>.13 operational tank entry</p> <p>Development and application of cargo-related operation plans, procedures and checklists</p> <p>Ability to calibrate and use monitoring and gas-detection systems, instruments and equipment</p> <p>Ability to manage and supervise personnel with cargo-related responsibilities</p>		<p>Calibration and use of monitoring and gas-detection equipment are consistent with safe operational practices and procedures</p> <p>Personnel are allocated duties and informed of procedures and standards of work to be followed, in a manner appropriate to the individuals concerned and in accordance with safe operational practices</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Familiarity with physical and chemical properties of chemical cargoes	<p>Knowledge and understanding of the chemical and the physical properties of noxious liquid substances, including:</p> <ul style="list-style-type: none"> <li>.1 chemical cargoes categories (corrosive, toxic, flammable, explosive)</li> <li>.2 chemical groups and industrial usage</li> <li>.3 reactivity of cargoes</li> </ul> <p>Understanding the information contained in a Material Safety Data Sheet (MSDS)</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Effective use is made of information resources for identification of properties and characteristics of noxious liquid substances and related gases, and their impact on safety, environmental protection and vessel operation</p>
Take precautions to prevent hazards	<p>Knowledge and understanding of the hazards and control measures associated with chemical tanker cargo operations, including:</p> <ul style="list-style-type: none"> <li>.1 flammability and explosion</li> <li>.2 toxicity</li> <li>.3 health hazards</li> <li>.4 inert gas composition</li> <li>.5 electrostatic hazards</li> <li>.6 reactivity</li> <li>.7 corrosivity</li> <li>.8 low-boiling-point cargoes</li> <li>.9 high-density cargoes</li> <li>.10 solidifying cargoes</li> <li>.11 polymerizing cargoes</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Relevant cargo-related hazards to the vessel and to personnel associated with chemical tanker cargo operations are correctly identified, and proper control measures are taken</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Take precautions to prevent hazards <i>(continued)</i>	Knowledge and understanding of dangers of non-compliance with relevant rules/regulations		
Apply occupational health and safety precautions	<p>Knowledge and understanding of safe working practices, including risk assessment and personal shipboard safety relevant to chemical tankers:</p> <ul style="list-style-type: none"> <li>.1 precautions to be taken when entering enclosed spaces, including correct use of different types of breathing apparatus</li> <li>.2 precautions to be taken before and during repair and maintenance work</li> <li>.3 precautions for hot and cold work</li> <li>.4 precautions for electrical safety</li> <li>.5 use of appropriate Personal Protective Equipment (PPE)</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Procedures designed to safeguard personnel and the ship are observed at all times</p> <p>Safe working practices are observed and appropriate safety and protective equipment is correctly used</p> <p>Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns</p> <p>Correct use of breathing apparatus</p> <p>Procedures for entry into enclosed spaces are observed</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Respond to emergencies	<p>Knowledge and understanding of chemical tanker emergency procedures, including:</p> <ul style="list-style-type: none"> <li>.1 ship emergency response plans</li> <li>.2 cargo operations emergency shutdown</li> <li>.3 actions to be taken in the event of failure of systems or services essential to cargo</li> <li>.4 fire fighting on chemical tankers</li> <li>.5 enclosed space rescue</li> <li>.6 cargo reactivity</li> <li>.7 jettisoning cargo</li> <li>.8 use of a Material Safety Data Sheet (MSDS)</li> </ul> <p>Actions to be taken following collision, grounding, or spillage</p> <p>Knowledge of medical first aid procedures on board chemical tankers, with reference to the Medical First Aid Guide for Use in Accidents involving Dangerous Goods (MFAG)</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>The type and impact of the emergency is promptly identified and the response actions conform with established emergency procedures and contingency plans</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> <p>Evacuation, emergency shutdown and isolation procedures are appropriate to the nature of the emergency and are implemented promptly</p> <p>The identification of and actions taken in a medical emergency conform to current recognized first aid practice and international guidelines</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Take precautions to prevent pollution of the environment	Understanding of procedures to prevent pollution of the atmosphere and the environment	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  .4 approved training programme	Operations are conducted in accordance with accepted principles and procedures to prevent pollution of the environment
Monitor and control compliance with legislative requirements	Knowledge and understanding of relevant provisions of the International Convention for the Prevention of Pollution from Ships (MARPOL) and other relevant IMO instruments, industry guidelines and port regulations as commonly applied  Proficiency in the use of the IBC Code and related documents	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  .4 approved training programme	The handling of cargoes complies with relevant IMO instruments and established industrial standards and codes of safe working practice

**Section A-V/1-2**

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

**Standard of competence**

1 Every candidate for certification in basic training for liquefied gas tanker cargo operations shall be required to:

- .1 demonstrate the competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-V/1-2-1; and
- .2 provide evidence of having achieved:
  - .2.1 the minimum knowledge, understanding and proficiency listed in column 2 of table A-V/1-2-1, and
  - .2.2 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-V/1-2-1.

2 Every candidate for certification in advanced training for liquefied gas tanker cargo operations shall be required to:

- .1 demonstrate the competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-V/1-2-2; and
- .2 provide evidence of having achieved:
  - .2.1 the minimum knowledge, understanding and proficiency listed in column 2 of table A-V/1-2-2, and
  - .2.2 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-V/1-2-2.

*Table A-V/1-2-1*  
**Specification of minimum standard of competence in basic training  
for liquefied gas tanker cargo operations**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Contribute to the safe operation of a liquefied gas tanker	<p><i>Design and operational characteristics of liquefied gas tankers</i></p> <p>Basic knowledge of liquefied gas tankers</p> <ul style="list-style-type: none"> <li>.1 types of liquefied gas tankers</li> <li>.2 general arrangement and construction</li> </ul> <p>Basic knowledge of cargo operations:</p> <ul style="list-style-type: none"> <li>.1 piping systems and valves</li> <li>.2 cargo handling equipment</li> <li>.3 loading, unloading and care in transit</li> <li>.4 emergency shutdown (ESD) system</li> <li>.5 tank cleaning, purging, gas-freeing and inerting</li> </ul> <p>Basic knowledge of the physical properties of liquefied gases, including:</p> <ul style="list-style-type: none"> <li>.1 properties and characteristics</li> <li>.2 pressure and temperature, including vapour pressure/temperature relationship</li> <li>.3 types of electrostatic charge generation</li> </ul>	Examination and assessment of evidence obtained from one or more of the following: <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	Communications within the area of responsibility are clear and effective  Cargo operations are carried out in accordance with accepted principles and procedures to ensure safety of operations

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Contribute to the safe operation of a liquefied gas tanker (continued)	.4 chemical symbols  Knowledge and understanding of tanker safety culture and safety management		
Take precautions to prevent hazards	Basic knowledge of the hazards associated with tanker operations, including:  .1 health hazards .2 environmental hazards .3 reactivity hazards .4 corrosion hazards .5 explosion and flammability hazards .6 sources of ignition .7 electrostatic hazards .8 toxicity hazards .9 vapour leaks and clouds .10 extremely low temperatures .11 pressure hazards  Basic knowledge of hazard controls:  .1 inerting, drying and monitoring techniques .2 anti-static measures .3 ventilation .4 segregation .5 cargo inhibition .6 importance of cargo compatibility	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 .4 approved training programme	Correctly identifies, on an MSDS, relevant cargo-related hazards to the vessel and to personnel, and takes the appropriate actions in accordance with established procedures  Identification and actions on becoming aware of a hazardous situation conform to established procedures in line with best practice



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Take precautions to prevent hazards (continued)	.7 atmospheric control .8 gas testing Understanding of information on a Material Safety Data Sheet (MSDS)		
Apply occupational health and safety precautions and measures	Function and proper use of gas-measuring instruments and similar equipment Proper use of safety equipment and protective devices, including: .1 breathing apparatus and tank evacuating equipment .2 protective clothing and equipment .3 resuscitators .4 rescue and escape equipment Basic knowledge of safe working practices and procedures in accordance with legislation and industry guidelines and personal shipboard safety relevant to liquefied gas tankers, including: .1 precautions to be taken when entering enclosed spaces .2 precautions to be taken before and during repair and maintenance work .3 safety measures for hot and cold work .4 electrical safety .5 ship/shore safety checklist	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 .4 approved training programme	Procedures for entry into enclosed spaces are observed Procedures and safe working practices designed to safeguard personnel and the ship are observed at all times Appropriate safety and protective equipment is correctly used

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Apply occupational health and safety precautions and measures <i>(continued)</i>	Basic knowledge of first aid with reference to a Material Safety Data Sheet (MSDS)		First aid do's and don'ts
Carry out fire-fighting operations	<p>Tanker fire organization and action to be taken</p> <p>Special hazards associated with cargo handling and transportation of liquefied gases in bulk</p> <p>Fire-fighting agents used to extinguish gas fires</p> <p>Fixed fire-fighting foam system operations</p> <p>Portable fire-fighting foam operations</p> <p>Fixed dry chemical system operations</p> <p>Basic knowledge of spill containment in relation to fire-fighting operations</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>Initial actions and follow-up actions on becoming aware of an emergency conform with established practices and procedures</p> <p>Action taken on identifying muster signals is appropriate to the indicated emergency and complies with established procedures</p> <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>
Respond to emergencies	Basic knowledge of emergency procedures, including emergency shutdown	<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</p> <p>.4 approved training programme</p>	The type and impact of the emergency is promptly identified and the response actions conform to the emergency procedures and contingency plans

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Take precautions to prevent pollution of the environment from the release of liquefied gases</p>	<p>Basic knowledge of the effects of pollution on human and marine life</p> <p>Basic knowledge of shipboard procedures to prevent pollution</p> <p>Basic knowledge of measures to be taken in the event of spillage, including the need to:</p> <ul style="list-style-type: none"> <li>.1 report relevant information to the responsible persons</li> <li>.2 assist in implementing shipboard spill-containment procedures</li> <li>.3 prevent brittle fracture</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Procedures designed to safeguard the environment are observed at all times</p>

*Table A-V/1-2-2*  
**Specification of minimum standard of competence in advanced training  
for liquefied gas tanker cargo operations**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Ability to safely perform and monitor all cargo operations	<p><i>Design and characteristics of a liquefied gas tanker</i></p> <p>Knowledge of liquefied gas tanker design, systems, and equipment, including:</p> <ul style="list-style-type: none"> <li>.1 types of liquefied gas tankers and cargo tanks construction</li> <li>.2 general arrangement and construction</li> <li>.3 cargo containment systems, including materials of construction and insulation</li> <li>.4 cargo-handling equipment and instrumentation, including: <ul style="list-style-type: none"> <li>.1 cargo pumps and pumping arrangements</li> <li>.2 cargo pipelines and valves</li> <li>.3 expansion devices</li> <li>.4 flame screens</li> <li>.5 temperature monitoring systems</li> <li>.6 cargo tank level-gauging systems</li> <li>.7 tank pressure monitoring and control systems</li> </ul> </li> <li>.5 cargo temperature maintenance system</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Communications are clear, understood and successful</p> <p>Cargo operations are carried out in a safe manner, taking into account liquefied gas tanker designs, systems and equipment</p> <p>Pumping operations are carried out in accordance with accepted principles and procedures and are relevant to the type of cargo</p> <p>Cargo operations are planned, risk is managed and carried out in accordance with accepted principles and procedures to ensure safety of operations and avoid pollution of the marine environment</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Ability to safely perform and monitor all cargo operations (<i>continued</i>)</p>	<p>.6 tank atmosphere control systems (inert gas, nitrogen), including storage, generation and distribution systems</p> <p>.7 cofferdam heating systems</p> <p>.8 gas-detecting systems</p> <p>.9 ballast system</p> <p>.10 boil-off systems</p> <p>.11 reliquefaction systems</p> <p>.12 cargo Emergency Shut Down system (ESD)</p> <p>.13 custody transfer system</p> <p>Knowledge of pump theory and characteristics, including types of cargo pumps and their safe operation</p> <p><i>Loading, unloading, care and handling of cargo</i></p> <p>Knowledge of the effect of bulk liquid cargoes on trim and stability and structural integrity</p> <p>Proficiency in tanker safety culture and implementation of safety management requirements</p>		<p>Proper loading, stowage and unloading of liquefied gas cargoes ensures that stability and stress conditions remain within safe limits at all times</p> <p>Potential non-compliance with cargo-related procedures is promptly identified and rectified</p> <p>Actions taken and procedures followed correctly identify and make full use of appropriate shipboard equipment</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Ability to safely perform and monitor all cargo operations (<i>continued</i>)</p>	<p>Proficiency to apply safe preparations, procedures and checklists for all cargo operations, including:</p> <ul style="list-style-type: none"> <li>.1 post docking and loading: <ul style="list-style-type: none"> <li>.1 tank inspection</li> <li>.2 inerting (Oxygen reduction, dewpoint reduction)</li> <li>.3 gassing-up</li> <li>.4 cooling down</li> <li>.5 loading</li> <li>.6 deballasting</li> <li>.7 sampling, including closed-loop sampling</li> </ul> </li> <li>.2 sea passage: <ul style="list-style-type: none"> <li>.1 cooling down</li> <li>.2 pressure maintenance</li> <li>.3 boil-off</li> <li>.4 inhibiting</li> </ul> </li> <li>.3 unloading: <ul style="list-style-type: none"> <li>.1 unloading</li> <li>.2 ballasting</li> <li>.3 stripping and cleaning systems</li> <li>.4 systems to make the tank liquid-free</li> </ul> </li> <li>.4 pre-docking preparation: <ul style="list-style-type: none"> <li>.1 warm-up</li> <li>.2 inerting</li> <li>.3 gas-freeing</li> </ul> </li> <li>.5 ship-to-ship transfer</li> </ul>		<p>Calibration and use of monitoring and gas-detection equipment is consistent with safe operational practices and procedures</p> <p>Procedures for monitoring and safety systems ensure that all alarms are detected promptly and acted upon in accordance with established procedures</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Ability to safely perform and monitor all cargo operations (<i>continued</i>)</p>	<p>Proficiency to perform cargo measurements and calculations, including:</p> <ul style="list-style-type: none"> <li>.1 liquid phase</li> <li>.2 gas phase</li> <li>.3 On Board Quantity (OBQ)</li> <li>.4 Remain On Board (ROB)</li> <li>.5 boil-off cargo calculations</li> </ul> <p>Proficiency to manage and supervise personnel with cargo-related responsibilities</p>		<p>Personnel are allocated duties and informed of procedures and standards of work to be followed, in a manner appropriate to the individuals concerned and in accordance with safe operational practices</p>
<p>Familiarity with physical and chemical properties of liquefied gas cargoes</p>	<p>Knowledge and understanding of basic chemistry and physics and the relevant definitions related to the safe carriage of liquefied gases in bulk in ships, including:</p> <ul style="list-style-type: none"> <li>.1 the chemical structure of gases</li> <li>.2 the properties and characteristics of liquefied gases (including CO<sub>2</sub>) and their vapours, including:                             <ul style="list-style-type: none"> <li>.1 simple gas laws</li> <li>.2 states of matter</li> <li>.3 liquid and vapour densities</li> <li>.4 diffusion and mixing of gases</li> <li>.5 compression of gases</li> </ul> </li> <li>.6 reliquefaction and refrigeration of gases</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Effective use is made of information resources for identification of properties and characteristics of liquefied gases and their impact on safety, environmental protection and vessel operation</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Familiarity with physical and chemical properties of liquefied gas cargoes ( <i>continued</i> )	<p>.7 critical temperature of gases and pressure</p> <p>.8 flashpoint, upper and lower explosive limits, auto-ignition temperature</p> <p>.9 compatibility, reactivity and positive segregation of gases</p> <p>.10 polymerization</p> <p>.11 saturated vapour pressure/reference temperature</p> <p>.12 dewpoint and bubble point</p> <p>.13 lubrication of compressors</p> <p>.14 hydrate formation</p> <p>.3 the properties of single liquids</p> <p>.4 the nature and properties of solutions</p> <p>.5 thermodynamic units</p> <p>.6 basic thermodynamic laws and diagrams</p> <p>.7 properties of materials</p> <p>.8 effect of low temperature – brittle fracture</p> <p>Understanding the information contained in a Material Safety Data Sheet (MSDS)</p>		



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Take precautions to prevent hazards</p>	<p>Knowledge and understanding of the hazards and control measures associated with liquefied gas tanker cargo operations, including:</p> <ul style="list-style-type: none"> <li>.1 flammability</li> <li>.2 explosion</li> <li>.3 toxicity</li> <li>.4 reactivity</li> <li>.5 corrosivity</li> <li>.6 health hazards</li> <li>.7 inert gas composition</li> <li>.8 electrostatic hazards</li> <li>.9 polymerizing cargoes</li> </ul> <p>Proficiency to calibrate and use monitoring and gas-detection systems, instruments and equipment</p> <p>Knowledge and understanding of dangers of non-compliance with relevant rules/regulations</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Relevant cargo-related hazards to the vessel and to personnel associated with liquefied gas tanker cargo operations are correctly identified, and proper control measures are taken</p> <p>Use of gas-detection devices is in accordance with manuals and good practice</p>
<p>Apply occupational health and safety precautions</p>	<p>Knowledge and understanding of safe working practices, including risk assessment and personal shipboard safety relevant to liquefied gas tankers, including:</p> <ul style="list-style-type: none"> <li>.1 precautions to be taken when entering enclosed spaces (such as compressor rooms), including the correct use of different types of breathing apparatus</li> </ul>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	<p>Procedures designed to safeguard personnel and the ship are observed at all times</p> <p>Safe working practices are observed and appropriate safety and protective equipment is correctly used</p> <p>Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns</p> <p>Correct use of breathing apparatus</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Apply occupational health and safety precautions <i>(continued)</i>	<p>.2 precautions to be taken before and during repair and maintenance work, including work affecting pumping, piping, electrical and control systems</p> <p>.3 precautions for hot and cold work</p> <p>.4 precautions for electrical safety</p> <p>.5 use of appropriate Personal Protective Equipment (PPE)</p> <p>.6 precautions for cold burn and frostbite</p> <p>.7 proper use of personal toxicity monitoring equipment</p>		
Respond to emergencies	<p>Knowledge and understanding of liquefied gas tanker emergency procedures, including:</p> <p>.1 ship emergency response plans</p> <p>.2 cargo operations emergency shutdown procedure</p> <p>.3 emergency cargo valve operations</p> <p>.4 actions to be taken in the event of failure of systems or services essential to cargo operations</p> <p>.5 fire-fighting on liquefied gas tankers</p> <p>.6 jettisoning of cargo</p> <p>.7 enclosed space rescue</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</p> <p>.4 approved training programme</p>	<p>The type and impact of emergency is promptly identified and the response actions conform with established emergency procedures and contingency plans</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> <p>Evacuation, emergency shutdown and isolation are appropriate to the nature of the emergency and implemented promptly</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Respond to emergencies (continued)	<p>Actions to be taken following collision, grounding or spillage and envelopment of the ship in toxic or flammable vapour</p> <p>Knowledge of medical first-aid procedures and antidotes on board liquefied gas tankers, with reference to the Medical First Aid Guide for Use in Accidents involving Dangerous Goods (MFAG)</p>		The identification of and actions taken in a medical emergency conform to current recognized first aid practice and international guidelines
Take precautions to prevent pollution of the environment	Understanding of procedures to prevent pollution of the environment	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	Operations are conducted in accordance with accepted principles and procedures to prevent pollution of the environment
Monitor and control compliance with legislative requirements	<p>Knowledge and understanding of relevant provisions of the International Convention for the Prevention of Pollution from Ships (MARPOL) and other relevant IMO instruments, industry guidelines and port regulations as commonly applied</p> <p>Proficiency in the use of the IBC and IGC Codes and related documents</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training</li> <li>.4 approved training programme</li> </ul>	The handling of liquefied gas cargoes complies with relevant IMO instruments and established industrial standards and codes of safe working practices

**Section A-V/2**

*Mandatory minimum requirements for the training and qualification of masters, officers, ratings and other personnel on 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 passageways;
  - .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.

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

2 The additional safety training required by regulation V/2, paragraph 5, 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.

### *Embarkation procedures*

- .3 Embarking and disembarking passengers, with special attention to disabled persons and persons needing assistance.

## **Crisis management and human behaviour training**

3 Masters, chief engineer officers, chief mates, second engineer officers and any person having responsibility for the safety of passengers in emergency situations shall:

- .1 have successfully completed the approved crisis management and human behaviour training required by regulation V/2, paragraph 6, in accordance with their capacity, duties and responsibilities as set out in table A-V/2; and
- .2 be required to provide evidence that the required standard of competence has been achieved in accordance with the methods and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-V/2.

## **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, for loading, discharging or securing cargo or for closing hull openings on board ro-ro passenger ships 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 programs 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 spaces; and
- .6.2 apply properly the procedures established for the ship for ventilation of ro-ro spaces during loading and discharging of vehicles, while on voyage and in emergencies.

Table A-V/2

**Specification of minimum standard of competence in crisis management  
and human behaviour**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Organize shipboard emergency procedures	<p>Knowledge of:</p> <ul style="list-style-type: none"> <li>.1 the general design and layout of the ship</li> <li>.2 safety regulations</li> <li>.3 emergency plans and procedures</li> </ul> <p>The importance of the principles for the development of ship-specific emergency procedures, including:</p> <ul style="list-style-type: none"> <li>.1 the need for pre-planning and drills of shipboard emergency procedures</li> <li>.2 the need for all personnel to be aware of and adhere to pre-planned emergency procedures as carefully as possible in the event of an emergency situation</li> </ul>	Assessment of evidence obtained from approved training, exercises with one or more prepared emergency plans and practical demonstration	The shipboard emergency procedures ensure a state of readiness to respond to emergency situations
Optimize the use of resources	<p>Ability to optimize the use of resources, taking into account:</p> <ul style="list-style-type: none"> <li>.1 the possibility that resources available in an emergency may be limited</li> <li>.2 the need to make full use of personnel and equipment immediately available and, if necessary, to improvise</li> </ul> <p>Ability to organize realistic drills to maintain a state of readiness, taking into account lessons learnt from previous accidents involving passenger ships; debriefing after drills</p>	Assessment of evidence obtained from approved training, practical demonstration and shipboard training and drills of emergency procedures	<p>Contingency plans optimize the use of available resources</p> <p>Allocation of tasks and responsibilities reflects the known competence of individuals</p> <p>Roles and responsibilities of teams and individuals are clearly defined</p>



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Control response to emergencies	<p>Ability to make an initial assessment and provide an effective response to emergency situations in accordance with established emergency procedures</p> <p><i>Leadership skills</i></p> <p>Ability to lead and direct others in emergency situations, including the need:</p> <ul style="list-style-type: none"> <li>.1 to set an example during emergency situations</li> <li>.2 to focus decision making, given the need to act quickly in an emergency</li> <li>.3 to motivate, encourage and reassure passengers and other personnel</li> </ul> <p><i>Stress handling</i></p> <p>Ability to identify the development of symptoms of excessive personal stress and those of other members of the ship's emergency team</p> <p>Understanding that stress generated by emergency situations can affect the performance of individuals and their ability to act on instructions and follow procedures</p>	<p>Assessment of evidence obtained from approved training, practical demonstration and shipboard training and drills of emergency procedures</p>	<p>Procedures and actions are in accordance with established principles and plans for crisis management on board</p> <p>Objectives and strategy are appropriate to the nature of the emergency, take account of contingencies and make optimum use of available resources</p> <p>Actions of crew members contribute to maintaining order and control</p>
Control passengers and other personnel during emergency situations	<p><i>Human behaviour and responses</i></p> <p>Ability to control passengers and other personnel in emergency situations, including:</p>	<p>Assessment of evidence obtained from approved training, practical demonstration and shipboard training and drills of emergency procedures</p>	<p>Actions of crew members contribute to maintaining order and control</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Control passengers and other personnel during emergency situations ( <i>continued</i> )	<p>.1 awareness of the general reaction patterns of passengers and other personnel in emergency situations, including the possibility that:</p> <p>.1.1 generally it takes some time before people accept the fact that there is an emergency situation</p> <p>.1.2 some people may panic and not behave with a normal level of rationality, that their ability to comprehend may be impaired and they may not be as responsive to instructions as in non-emergency situations</p> <p>.2 awareness that passengers and other personnel may, <i>inter alia</i>:</p> <p>.2.1 start looking for relatives, friends and/or their belongings as a first reaction when something goes wrong</p> <p>.2.2 seek safety in their cabins or in other places on board where they think that they can escape danger</p> <p>.2.3 tend to move to the upper side when the ship is listing</p> <p>.3 appreciation of the possible problem of panic resulting from separating families</p>		

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Establish and maintain effective communications</p>	<p>Ability to establish and maintain effective communications, including:</p> <ul style="list-style-type: none"> <li>.1 the importance of clear and concise instructions and reports</li> <li>.2 the need to encourage an exchange of information with, and feedback from, passengers and other personnel</li> </ul> <p>Ability to provide relevant information to passengers and other personnel during an emergency situation, to keep them apprised of the overall situation and to communicate any action required of them, taking into account:</p> <ul style="list-style-type: none"> <li>.1 the language or languages appropriate to the principal nationalities of passengers and other personnel carried on the particular route</li> <li>.2 the possible need to communicate during an emergency by some other means, such as by demonstration, or by hand signals or calling attention to the location of instructions, muster stations, life-saving devices or evacuation routes, when oral communication is impractical</li> <li>.3 the language 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</li> </ul>	<p>Assessment of evidence obtained from approved training, exercises and practical demonstration</p>	<p>Information from all available sources is obtained, evaluated and confirmed as quickly as possible and reviewed throughout the emergency</p> <p>Information given to individuals, emergency response teams and passengers is accurate, relevant and timely</p> <p>Information keeps passengers informed as to the nature of the emergency and the actions required of them</p>

## CHAPTER VI

### Standards regarding emergency, occupational safety, security, medical care and survival functions

#### Section A-VI/1

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

#### Safety 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 lifejackets;
- .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,

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\* The relevant IMO Model Course(s) may assist in the preparation of courses.

- .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 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 Seafarers qualified in accordance with paragraph 2 in basic training shall be required, every five years, to provide evidence of having maintained the required standard of competence, to undertake the tasks, duties and responsibilities listed in column 1 of tables A-VI/1-1 and A-VI/1-2.
- 4 Parties may accept onboard training and experience for maintaining the required standard of competence in the following areas:
- .1 personal survival techniques as set out in table A-VI/1-1:
    - .1.1 don a lifejacket;
    - .1.2 board a survival craft from the ship, while wearing a lifejacket;
    - .1.3 take initial actions on boarding a lifeboat to enhance chance of survival;
    - .1.4 stream a lifeboat drogue or sea-anchor;
    - .1.5 operate survival craft equipment; and
    - .1.6 operate location devices, including radio equipment;
  - .2 fire prevention and fire fighting as set out in table A-VI/1-2:
    - .2.1 use self-contained breathing apparatus; and
    - .2.2 effect a rescue in a smoke-filled space, using an approved smoke-generating device aboard, while wearing a breathing apparatus.

### **Exemptions**

5 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.

Table A-VI/1-1

**Specification of minimum standard of competence in personal survival techniques**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
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>.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>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 lifejacket</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 lifejacket</p> <p>.5 swim while wearing a lifejacket</p> <p>.6 keep afloat without a lifejacket</p> <p>.7 board a survival craft from the ship and water while wearing a lifejacket</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>	<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>

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
<p>Minimize the risk of fire and maintain a state of readiness to respond to emergency situations involving fire</p>	<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>	<p>Assessment of evidence obtained from approved instruction or attendance at an approved course</p>	<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>
<p>Fight and extinguish fires</p>	<p>Fire-fighting equipment and its location on board</p> <p>Instruction in:</p> <ul style="list-style-type: none"> <li>.1 fixed installations</li> <li>.2 fire-fighter's outfits</li> <li>.3 personal equipment</li> <li>.4 fire-fighting appliances and equipment</li> <li>.5 fire-fighting methods</li> <li>.6 fire-fighting agents</li> <li>.7 fire-fighting procedures</li> </ul>	<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"> <li>.1 use various types of portable fire extinguishers</li> <li>.2 use self-contained breathing apparatus</li> </ul>	<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>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Fight and extinguish fires (continued)	.8 use of breathing apparatus for fighting fires and effecting rescues	<p>.3 extinguish smaller fires, e.g., electrical fires, oil fires, propane fires</p> <p>.4 extinguish extensive fires with water, using jet and spray nozzles</p> <p>.5 extinguish fires with foam, powder or any other suitable chemical agent</p> <p>.6 enter and pass through, with lifeline but without breathing apparatus, a compartment into which high-expansion foam has been injected</p> <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/1-3

**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"> <li>.1 position casualty</li> <li>.2 apply resuscitation techniques</li> <li>.3 control bleeding</li> <li>.4 apply appropriate measures of basic shock management</li> <li>.5 apply appropriate measures in event of burns and scalds, including accidents caused by electric current</li> <li>.6 rescue and transport a casualty</li> <li>.7 improvise bandages and use materials in the emergency kit</li> </ul>	<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	<p>Types of emergency which may occur, such as collision, fire, foundering</p> <p>Knowledge of shipboard contingency plans for response to emergencies</p> <p>Emergency signals and specific duties allocated to crew members in the muster list; muster stations; correct use of personal safety equipment</p> <p>Action to take on discovering potential emergency, including fire, collision, foundering and ingress of water into the ship</p> <p>Action to take on hearing emergency alarm signals</p> <p>Value of training and drills</p> <p>Knowledge of escape routes and internal communication and alarm systems</p>	Assessment of evidence obtained from approved instruction or during attendance at an approved course	<p>Initial action on becoming aware of an emergency conforms to established emergency response procedures</p> <p>Information given on raising alarm is prompt, accurate, complete and clear</p>
Take precautions to prevent pollution of the marine environment	<p>Basic knowledge of the impact of shipping on the marine environment and the effects of operational or accidental pollution on it</p> <p>Basic environmental protection procedures</p> <p>Basic knowledge of complexity and diversity of the marine environment</p>	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

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
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
Contribute to effective communications on board ship	<p>Understand the principles of, and barriers to, effective communication between individuals and teams within the ship</p> <p>Ability to establish and maintain effective communications</p>	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>Basic teamworking principles and practice, including conflict resolution</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.

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Understand and take necessary actions to control fatigue	<p>Importance of obtaining the necessary rest</p> <p>Effects of sleep, schedules, and the circadian rhythm on fatigue</p> <p>Effects of physical stressors on seafarers</p> <p>Effects of environmental stressors in and outside the ship and their impact on seafarers</p> <p>Effects of schedule changes on seafarer fatigue</p>	Assessment of evidence obtained from approved instruction or during attendance at an approved course	Fatigue management practices are observed and appropriate actions are used at all times

**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 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.

5 Seafarers qualified in accordance with paragraph 4 in survival craft and rescue boats other than fast rescue boats shall be required, every five years, to provide evidence of having maintained the required standards of competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/2-1.

6 Parties may accept onboard training and experience for maintaining the required standard of competence of table A-VI/2-1 in the following areas:

- .1 take charge of a survival craft or rescue boat during and after launch:
  - .1.1 interpret the markings on survival craft as to the number of persons they are intended to carry;
  - .1.2 give correct commands for launching and boarding survival craft, clearing the ship and handling and disembarking persons from survival craft;
  - .1.3 prepare and safely launch survival craft and clear the ship's side quickly; and
  - .1.4 safely recover survival craft and rescue boats;

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

- .2 manage survivors and survival craft after abandoning ship:
  - .2.1 row and steer a boat and steer by compass;
  - .2.2 use individual items of equipment of survival crafts, except for pyrotechnics; and
  - .2.3 rig devices to aid location;
- .3 use locating devices, including communication and signalling apparatus:
  - .3.1 use of portable radio equipment for survival craft; and
- .4 apply first aid to survivors.

## **PROFICIENCY IN FAST RESCUE BOATS**

### **Standard of competence**

7 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.

8 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\*.

9 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.

10 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence 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.

11 Seafarers qualified in accordance with paragraph 10 in fast rescue boats shall be required, every five years, to provide evidence of having maintained the required standards of competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/2-2.

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

12 Parties may accept onboard training and experience for maintaining the required standard of competence of table A-VI/2-2, in the following areas:

- .1 Take charge of a fast rescue boat during and after launch:
  - .1.1 control safe launching and recovery of a fast rescue boat;
  - .1.2 handle a fast rescue boat in prevailing weather and sea conditions;
  - .1.3 use communications and signalling equipment between the fast rescue boat and a helicopter and a ship;
  - .1.4 use the emergency equipment carried; and
  - .1.5 carry out search patterns, taking account of environmental factors.

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>Dangers associated with use of on-load release devices</p> <p>Knowledge of maintenance procedures</p>	<p>Assessment of evidence obtained from practical demonstration of ability to:</p> <p>.1 right an inverted liferaft while wearing a lifejacket</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 and operate off-load and on-load release devices</p> <p>.5 safely recover survival craft and rescue boats, including the proper resetting of both off-load and on-load release devices</p> <p>using: inflatable liferaft and open or enclosed lifeboat with inboard engine or approved simulator training, where appropriate</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> <p>Equipment is operated in accordance with manufacturers' instructions for release and resetting</p>
Operate a survival craft engine	Methods of starting and operating a survival craft engine and its accessories together with the use of the fire extinguisher provided	Assessment of evidence obtained from practical demonstration of ability to start and operate an inboard engine fitted in an open or enclosed lifeboat	Propulsion is available and maintained as required for manoeuvring



Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Manage survivors and survival craft after abandoning ship</p>	<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>	<p>Survival management is appropriate to prevailing circumstances and conditions</p>
<p>Use locating devices, including communication and signalling apparatus and pyrotechnics</p>	<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>	<p>Use and choice of communication and signalling apparatus is appropriate to prevailing circumstances and conditions</p>

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Apply first aid to survivors	<p>Use of the first-aid kit and resuscitation techniques</p> <p>Management of injured persons, including control of bleeding and shock</p>	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	<p>Identification of the probable cause, nature and extent of injuries or condition is prompt and accurate</p> <p>Priority and sequence of treatment minimizes any threat to life</p>

Table A-VI/2-2

**Specification of the minimum standard of competence in fast rescue boats**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Understand the construction, maintenance, repair and outfitting of fast rescue boats	<p>Construction and outfitting of fast rescue boats and individual items of their equipment</p> <p>Knowledge of the maintenance and emergency repairs of fast rescue boats and the normal inflation and deflation of buoyancy compartments of inflated fast rescue boats</p>	Assessment of evidence obtained from practical instruction	<p>The method of carrying out routine maintenance and emergency repairs</p> <p>Identify components and required equipment for fast rescue boats</p>
Take charge of the launching equipment and appliance as commonly fitted, during launching and recovery	<p>Assessment of the readiness of launching equipment and launching appliance of fast rescue boats for immediate launching and operation</p> <p>Understand the operation and limitations of the winch, brakes, falls, painters, motion-compensation and other equipment as commonly fitted</p> <p>Safety precautions during launching and recovery of a fast rescue boat</p> <p>Launching and recovery of a fast rescue boat in prevailing and adverse weather and sea conditions</p>	Assessment of evidence obtained from practical demonstration of ability to control safe launching and recovery of a fast rescue boat, with equipment as fitted	Ability to prepare and take charge of the launching equipment and appliance during launching and recovery of a fast rescue boat
Take charge of a fast rescue boat as commonly fitted, during launching and recovery	<p>Assessment of the readiness of fast rescue boats and related equipment for immediate launching and operation</p> <p>Safety precautions during launching and recovery of a fast rescue boat</p> <p>Launching and recovery of a fast rescue boat in prevailing and adverse weather and sea conditions</p>	Assessment of evidence obtained from practical demonstration of ability to conduct safe launching and recovery of a fast rescue boat, with equipment as fitted	Ability to take charge of a fast rescue boat during launching and recovery

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 fast rescue boat after launching	<p>Particular characteristics, facilities and limitations of fast rescue boats</p> <p>Procedures for the righting of 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 evidence obtained from practical demonstration of ability to:</p> <p>.1 right a capsized fast rescue boat</p> <p>.2 handle a fast rescue boat in prevailing weather and sea conditions</p> <p>.3 swim in special equipment</p> <p>.4 use communications and signalling equipment between the fast rescue boat and a helicopter and a ship</p> <p>.5 use the emergency equipment carried</p> <p>.6 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>.7 carry out search patterns, taking account of environmental factors</p>	Demonstration of operation of fast rescue boats within equipment limitations in prevailing weather conditions
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

## **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, 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.
- 5 Seafarers qualified in accordance with paragraph 4 in advanced fire fighting shall be required, every five years, to provide evidence of having maintained the required standards of competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/3.
- 6 Parties may accept onboard training and experience for maintaining the required standard of competence of table A-VI/3, in the following areas:
  - .1 Control fire-fighting operations aboard ships;
    - .1.1 fire-fighting procedures at sea and in port, with particular emphasis on organization, tactics and command;
    - .1.2 communication and coordination during fire-fighting operations;
    - .1.3 ventilation control, including smoke extraction;
    - .1.4 control of fuel and electrical systems;
    - .1.5 fire-fighting process hazards (dry distillation, chemical reactions, boiler uptake, fires);
    - .1.6 fire precautions and hazards associated with the storage and handling of materials;
    - .1.7 management and control of injured persons; and
    - .1.8 procedures for coordination with shore-based fire fighters.

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

Table A-VI/3

**Specification of minimum standard of competence in advanced fire fighting**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
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 coordination during fire-fighting operations</p> <p>Ventilation control, including smoke extraction</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 coordination 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>
Organize and train fire parties	<p>Preparation of contingency plans</p> <p>Composition and allocation of personnel to fire parties</p> <p>Strategies and tactics for control of fires in various parts of the ship</p>	<p>Practical exercises and instruction conducted under approved and truly realistic training conditions, e.g., simulated shipboard conditions</p>	<p>Composition and organization of fire control parties ensure the prompt and effective implementation of emergency plans and procedures</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Inspect and service fire-detection and fire-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 fire-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 countermeasures is evaluated

**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.

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\* The relevant IMO Model Course(s) may assist in the preparation of courses.



Table A-VI/4-1

**Specification of minimum standard of competence 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 heat and cold Fractures, dislocations and muscular injuries Medical care of rescued persons Radio medical advice Pharmacology Sterilization 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 to others is minimized at all times Treatment of injuries and the patient's condition is appropriate and conforms to recognized first-aid practice and international guidelines

Table A-VI/4-2

**Specification of minimum standard of competence in medical care**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Provide medical care to the sick and injured while they remain on board	<p>Care of casualty involving:</p> <ul style="list-style-type: none"> <li>.1 head and spinal injuries</li> <li>.2 injuries of ear, nose, throat and eyes</li> <li>.3 external and internal bleeding</li> <li>.4 burns, scalds and frostbite</li> <li>.5 fractures, dislocations and muscular injuries</li> <li>.6 wounds, wound healing and infection</li> <li>.7 pain relief</li> <li>.8 techniques of sewing and clamping</li> <li>.9 management of acute abdominal conditions</li> <li>.10 minor surgical treatment</li> <li>.11 dressing and bandaging</li> </ul> <p>Aspects of nursing:</p> <ul style="list-style-type: none"> <li>.1 general principles</li> <li>.2 nursing care</li> </ul> <p>Diseases, including:</p> <ul style="list-style-type: none"> <li>.1 medical conditions and emergencies</li> <li>.2 sexually transmitted diseases</li> <li>.3 tropical and infectious diseases</li> </ul> <p>Alcohol and drug abuse</p>	<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 patient's condition is promptly recognized</p>

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 (continued)</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> <p>.1 disinfection, disinfestation, de-ratting</p> <p>.2 vaccinations</p> <p>Keeping records and copies of applicable regulations:</p> <p>.1 keeping medical records</p> <p>.2 international and national maritime medical regulations</p>		
<p>Participate in coordinated schemes for medical assistance to ships</p>	<p>External assistance, including:</p> <p>.1 radio medical advice</p> <p>.2 transportation of the ill and injured, including helicopter evacuation</p> <p>.3 medical care of sick seafarers involving cooperation with port health authorities or out-patient wards in port</p>		<p>Clinical examination procedures are complete and comply with instructions received</p> <p>The method and preparation for evacuation is in accordance with recognized procedures and is designed to maximize the welfare of the patient</p> <p>Procedures for seeking radio medical advice conform to established practice and recommendations</p>

**Section A-VI/5**

*Mandatory minimum requirements for the issue of certificates of proficiency for ship security officers*

**Standard of competence**

- 1 Every candidate for a certificate of proficiency as a ship security officer shall be required to demonstrate competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/5.
- 2 The level of knowledge of the subjects listed in column 2 of table A-VI/5 shall be sufficient to enable the candidate to act as the designated ship security officer.
- 3 Training and experience to achieve the necessary level of theoretical knowledge, understanding and proficiency shall take into account the guidance in section B-VI/5 of this Code.
- 4 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-VI/5.

Table A-VI/5

**Specifications of minimum standard of competence for ship security officers**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain and supervise the implementation of a ship security plan</p>	<p>Knowledge of international maritime security policy and responsibilities of Governments, companies and designated persons, including elements that may relate to piracy and armed robbery</p> <p>Knowledge of the purpose for and the elements that make up a ship security plan, related procedures and maintenance of records, including those that may relate to piracy and armed robbery</p> <p>Knowledge of procedures to be employed in implementing a ship security plan and reporting of security incidents</p> <p>Knowledge of maritime security levels and the consequential security measures and procedures aboard ship and in the port facility environment</p> <p>Knowledge of the requirements and procedures for conducting internal audits, on-scene inspections, control and monitoring of security activities specified in a ship security plan</p> <p>Knowledge of the requirements and procedures for reporting to the company security officer any deficiencies and non-conformities identified during internal audits, periodic reviews, and security inspections</p>	<p>Assessment of evidence obtained from approved training or examination</p>	<p>Procedures and actions are in accordance with the principles established by the ISPS Code and the SOLAS, 1974, as amended</p> <p>Legislative requirements relating to security are correctly identified</p> <p>Procedures achieve a state of readiness to respond to changes in maritime security levels</p> <p>Communications within the ship security officer's area of responsibility are clear and understood</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Maintain and supervise the implementation of a ship security plan <i>(continued)</i>	<p>Knowledge of the methods and procedures used to modify the ship security plan</p> <p>Knowledge of security-related contingency plans and the procedures for responding to security threats or breaches of security, including provisions for maintaining critical operations of the ship/port interface, including also elements that may relate to piracy and armed robbery</p> <p>Working knowledge of maritime security terms and definitions, including elements that may relate to piracy and armed robbery</p>		
Assess security risk, threat, and vulnerability	<p>Knowledge of risk assessment and assessment tools</p> <p>Knowledge of security assessment documentation, including the Declaration of Security</p> <p>Knowledge of techniques used to circumvent security measures, including those used by pirates and armed robbers</p> <p>Knowledge enabling recognition, on a non-discriminatory basis, of persons posing potential security risks</p> <p>Knowledge enabling recognition of weapons, dangerous substances and devices and awareness of the damage they can cause</p> <p>Knowledge of crowd management and control techniques, where appropriate</p>	<p>Assessment of evidence obtained from approved training, or approved experience and examination, including practical demonstration of competence to:</p> <p>.1 conduct physical searches</p> <p>.2 conduct non-intrusive inspections</p>	<p>Procedures and actions are in accordance with the principles established by the ISPS Code and the SOLAS, 1974, as amended</p> <p>Procedures achieve a state of readiness to respond to changes in the maritime security levels</p> <p>Communications within the ship security officer's area of responsibility are clear and understood</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Assess security risk, threat, and vulnerability <i>(continued)</i>	<p>Knowledge in handling sensitive security-related information and security-related communications</p> <p>Knowledge of implementing and co-ordinating searches</p> <p>Knowledge of the methods for physical searches and non-intrusive inspections</p>		
Undertake regular inspections of the ship to ensure that appropriate security measures are implemented and maintained	<p>Knowledge of the requirements for designating and monitoring restricted areas</p> <p>Knowledge of controlling access to the ship and to restricted areas on board ship</p> <p>Knowledge of methods for effective monitoring of deck areas and areas surrounding the ship</p> <p>Knowledge of security aspects relating to the handling of cargo and ship's stores with other shipboard personnel and relevant port facility security officers</p> <p>Knowledge of methods for controlling the embarkation, disembarkation and access while on board of persons and their effects</p>	Assessment of evidence obtained from approved training or examination	<p>Procedures and actions are in accordance with the principles established by the ISPS Code and the SOLAS,1974, as amended</p> <p>Procedures achieve a state of readiness to respond to changes in the maritime security levels</p> <p>Communications within the ship security officer's area of responsibility are clear and understood</p>
Ensure that security equipment and systems, if any, are properly operated, tested and calibrated	<p>Knowledge of the various types of security equipment and systems and their limitations, including those that could be used in case of attacks by pirates and armed robbers</p> <p>Knowledge of the procedures, instructions and guidance on the use of ship security alert systems</p>	Assessment of evidence obtained from approved training or examination	Procedures and actions are in accordance with the principles established by the ISPS Code and the SOLAS, 1974, as amended

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
	Knowledge of the methods for testing, calibrating, and maintaining security systems and equipment, particularly whilst at sea		
Encourage security awareness and vigilance	<p>Knowledge of training, drill and exercise requirements under relevant conventions, codes and IMO circulars, including those relevant to anti-piracy and anti-armed robbery</p> <p>Knowledge of the methods for enhancing security awareness and vigilance on board</p> <p>Knowledge of the methods for assessing the effectiveness of drills and exercises</p>	Assessment of evidence obtained from approved training or examination	<p>Procedures and actions are in accordance with the principles established by the ISPS Code and the SOLAS, 1974, as amended</p> <p>Communications within the ship security officer's area of responsibility are clear and understood</p>



## **Section A-VI/6**

*Mandatory minimum requirements for security-related training and instruction for all seafarers*

### **Standard of competence for security-related familiarization training**

1 Before being assigned to shipboard duties, all persons employed or engaged on a seagoing ship which is required to comply with the provisions of the ISPS Code, other than passengers, shall receive approved security-related familiarization training, taking account of the guidance given in part B, to be able to:

- .1 report a security incident, including a piracy or armed robbery threat or attack;
- .2 know the procedures to follow when they recognize a security threat; and
- .3 take part in security-related emergency and contingency procedures.

2 Seafarers with designated security duties engaged or employed on a seagoing ship shall, before being assigned such duties, receive security-related familiarization training in their assigned duties and responsibilities, taking into account the guidance given in part B.

3 The security-related familiarization training shall be conducted by the ship security officer or an equally qualified person.

### **Standard of competence for security-awareness training**

4 Seafarers employed or engaged in any capacity on board a ship which is required to comply with the provisions of the ISPS Code on the business of that ship as part of the ship's complement without designated security duties shall, before being assigned to any shipboard duties:

- .1 receive appropriate approved training or instruction in security awareness as set out in table A-VI/6-1;
- .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 table A-VI/6-1:
  - .2.1 by demonstration of competence, in accordance with the methods and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-VI/6-1; and
  - .2.2 by examination or continuous assessment as part of an approved training programme in the subjects listed in column 2 of table A-VI/6-1.

### *Transitional provisions*

5 Until 1 January 2014, seafarers who commenced an approved seagoing service prior to the date of entry into force of this section shall be able to establish that they meet the requirements of paragraph 4 by:

- .1 approved seagoing service as shipboard personnel, for a period of at least six months in total during the preceding three years; or

- .2 having performed security functions considered to be equivalent to the seagoing service required in paragraph 5.1; or
- .3 passing an approved test; or
- .4 successfully completing approved training.

### **Standard of competence for seafarers with designated security duties**

6 Every seafarer who is designated to perform security duties, including anti-piracy and anti-armed-robbery-related activities, shall be required to demonstrate competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/6-2.

7 The level of knowledge of the subjects in column 2 of table A-VI/6-2 shall be sufficient to enable every candidate to perform on board designated security duties, including anti-piracy and anti-armed-robbery-related activities.

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

- .1 demonstration of competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/6-2, 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/6-2.

### *Transitional provisions*

9 Until 1 January 2014, seafarers with designated security duties who commenced an approved seagoing service prior to the date of entry into force of this section shall be able to demonstrate competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/6-2 by:

- .1 approved seagoing service as shipboard personnel with designated security duties, for a period of at least six months in total during the preceding three years; or
- .2 having performed security functions considered to be equivalent to the seagoing service required in paragraph 9.1; or
- .3 passing an approved test; or
- .4 successfully completing approved training.

Table A-VI/6-1

**Specification of minimum standard of competence in security awareness**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Contribute to the enhancement of maritime security through heightened awareness</p>	<p>Basic working knowledge of maritime security terms and definitions, including elements that may relate to piracy and armed robbery</p> <p>Basic knowledge of international maritime security policy and responsibilities of Governments, companies and persons</p> <p>Basic knowledge of maritime security levels and their impact on security measures and procedures aboard ship and in port facilities</p> <p>Basic knowledge of security reporting procedures</p> <p>Basic knowledge of security-related contingency plans</p>	<p>Assessment of evidence obtained from approved instruction or during attendance at an approved course</p>	<p>Requirements relating to enhanced maritime security are correctly identified</p>
<p>Recognition of security threats</p>	<p>Basic knowledge of techniques used to circumvent security measures</p> <p>Basic knowledge enabling recognition of potential security threats, including elements that may relate to piracy and armed robbery</p> <p>Basic knowledge enabling recognition of weapons, dangerous substances and devices and awareness of the damage they can cause</p> <p>Basic knowledge in handling security-related information and security-related communications</p>	<p>Assessment of evidence obtained from approved instruction or during attendance at an approved course</p>	<p>Maritime security threats are correctly identified</p>

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>
<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Understanding of the need for and methods of maintaining security awareness and vigilance	Basic knowledge of training, drill and exercise requirements under relevant conventions, codes and IMO circulars, including those relevant for anti-piracy and anti-armed robbery	Assessment of evidence obtained from approved instruction or during attendance at an approved course	Requirements relating to enhanced maritime security are correctly identified

*Table A-VI/6-2*  
**Specifications of minimum standard of competence for seafarers  
with designated security duties**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Maintain the conditions set out in a ship security plan</p>	<p>Working knowledge of maritime security terms and definitions, including elements that may relate to piracy and armed robbery</p> <p>Knowledge of international maritime security policy and responsibilities of Governments, companies and persons, including working knowledge of elements that may relate to piracy and armed robbery</p> <p>Knowledge of maritime security levels and their impact on security measures and procedures aboard ship and in the port facilities</p> <p>Knowledge of security reporting procedures</p> <p>Knowledge of procedures and requirements for drills and exercises under relevant conventions, codes and IMO circulars, including working knowledge of those that may relate to piracy and armed robbery</p> <p>Knowledge of the procedures for conducting inspections and surveys and for the control and monitoring of security activities specified in a ship security plan</p>	<p>Assessment of evidence obtained from approved instruction or during attendance at an approved course</p>	<p>Procedures and actions are in accordance with the principles established by the ISPS Code and the SOLAS, 1974, as amended</p> <p>Legislative requirements relating to security are correctly identified</p> <p>Communications within the area of responsibility are clear and understood</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Maintain the conditions set forth in a ship security plan ( <i>continued</i> )	Knowledge of security-related contingency plans and the procedures for responding to security threats or breaches of security, including provisions for maintaining critical operations of the ship/port interface, and including also working knowledge of those that may relate to piracy and armed robbery		
Recognition of security risks and threats	<p>Knowledge of security documentation, including the Declaration of Security</p> <p>Knowledge of techniques used to circumvent security measures, including those used by pirates and armed robbers</p> <p>Knowledge enabling recognition of potential security threats</p> <p>Knowledge enabling recognition of weapons, dangerous substances and devices and awareness of the damage they can cause</p> <p>Knowledge of crowd management and control techniques, where appropriate</p> <p>Knowledge in handling security-related information and security-related communications</p> <p>Knowledge of the methods for physical searches and non-intrusive inspections</p>	Assessment of evidence obtained from approved instruction or during attendance at an approved course	Procedures and actions are in accordance with the principles established by the ISPS Code and the SOLAS, 1974, as amended

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Undertake regular security inspections of the ship	<p>Knowledge of the techniques for monitoring restricted areas</p> <p>Knowledge of controlling access to the ship and to restricted areas on board ship</p> <p>Knowledge of methods for effective monitoring of deck areas and areas surrounding the ship</p> <p>Knowledge of inspection methods relating to the cargo and ship's stores</p> <p>Knowledge of methods for controlling the embarkation, disembarkation and access while on board of persons and their effects</p>	Assessment of evidence obtained from approved instruction or during attendance at an approved course	Procedures and actions are in accordance with the principles established by the ISPS Code and the SOLAS Convention, as amended
Proper usage of security equipment and systems, if any	<p>General knowledge of various types of security equipment and systems, including those that could be used in case of attacks by pirates and armed robbers, including their limitations</p> <p>Knowledge of the need for testing, calibrating, and maintaining security systems and equipment, particularly whilst at sea</p>	Assessment of evidence obtained from approved instruction or during attendance at an approved course	<p>Equipment and systems operations are carried out in accordance with established equipment operating instructions and taking into account the limitations of the equipment and systems</p> <p>Procedures and actions are in accordance with the principles established by the ISPS Code and the SOLAS, 1974, as amended</p>

## 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 table 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 standard 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 standard 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:

- .1 in navigation or marine engineering shall be required to complete relevant training and meet the standard of competence for the function prescribed in either table A-II/4 or table A-III/4. Functions specified in table A-III/4 or A-II/4 respectively may be added provided the candidate completes, as appropriate, additional relevant training and meets the standards of competence prescribed in those tables for the function concerned;
- .2 as able seafarer deck shall be required, in addition to compliance with the standard of competence specified in table A-II/4, to complete relevant training and meet the standard of competence for all of the functions prescribed in table A-II/5. Functions specified in table A-III/4 or A-III/5 may be added provided the candidate completes, as appropriate, additional relevant training and meets the standard of competence prescribed in that (those) table(s) for the function(s) concerned; and
- .3 as able seafarer engine shall be required, in addition to compliance with the standard of competence specified in table A-III/4, to complete relevant training and meet



the standard of competence for all of the functions prescribed in table A-III/5. Functions specified in table A-II/4 or A-II/5 may be added provided the candidate completes, as appropriate, additional relevant training and meets the standards of competence prescribed in that (those) table(s) for the function(s) concerned.

## **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 the operational level in functions specified in tables A-II/1 and A-III/1 shall:

- .1 have approved seagoing service of not less than 12 months, 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, onboard 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-III/1 and 24 months shall be served performing functions set out in tables A-III/1 and A-III/2.

3 In accordance with the requirements of regulation VII/1, paragraph 1.3, every candidate for certification under the provisions of chapter VII at support level in functions specified in tables A-II/4 and A-III/4 shall have completed:

- .1 approved seagoing service including not less than 12 months experience, made up of:
  - .1.1 not less than 6 months associated with navigational watchkeeping duties; and
  - .1.2 not less than 6 months associated with engine-room duties; or

- .2 special training, either pre-sea or on board ship, including an approved period of seagoing service which shall not be less than 4 months, made up of:
  - .2.1 not less than 2 months associated with navigational watchkeeping duties; and
  - .2.2 not less than 2 months associated with engine-room duties;
- .3 the seagoing service, training and experience required by paragraph 3.1 or 3.2 shall be carried out under the direct supervision of an appropriately qualified officer or rating.

4 In accordance with the requirements of regulation VII/1, paragraph 1.3, every candidate for certification under the provisions of chapter VII at the support level in functions specified in tables A-II/5 and A-III/5 shall, while qualified to serve as a rating forming part of a navigational and engine-room watch, meet the standards of competence specified in sections A-II/5 and A-III/5 of the STCW Code and have completed:

- .1 approved seagoing service of not less than 30 months, made up of:
  - .1.1 not less than 18 months associated with able seafarer deck duties, and
  - .1.2 not less than 12 months associated with able seafarer engine duties; or
- .2 an approved training programme and not less than 18 months of approved seagoing service, made up of:
  - .2.1 not less than 12 months associated with able seafarer deck duties; and
  - .2.2 not less than 6 months associated with able seafarer engine duties; or
- .3 an approved special integrated deck and engine training programme, including not less than 12 months' approved seagoing service in an integrated deck and engine department, made up of:
  - .3.1 not less than 6 months associated with able seafarer deck duties; and
  - .3.2 not less than 6 months associated with able seafarer engine duties.

### **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 Administrations shall take account of the danger posed by fatigue of seafarers, especially those whose duties involve the safe and secure operation of a ship.

2 All persons who are assigned duty as officer in charge of a watch or as a rating forming part of a watch and those whose duties involve designated safety, prevention of pollution and security duties shall be provided with a rest period of not less than:

- .1 a minimum of 10 hours of rest in any 24-hour period; and
- .2 77 hours in any 7-day period.

3 The hours of rest may be divided into no more than two periods, one of which shall be at least 6 hours in length, and the intervals between consecutive periods of rest shall not exceed 14 hours.

4 The requirements for rest periods laid down in paragraphs 2 and 3 need not be maintained in the case of an emergency or in other overriding operational conditions. Musters, fire-fighting and lifeboat drills, and drills prescribed by national laws and regulations and by international instruments, shall be conducted in a manner that minimizes the disturbance of rest periods and does not induce fatigue.

5 Administrations shall require that watch schedules be posted where they are easily accessible. The schedules shall be established in a standardized format\* in the working language or languages of the ship and in English.

6 When a seafarer is on call, such as when a machinery space is unattended, the seafarer shall have an adequate compensatory rest period if the normal period of rest is disturbed by call-outs to work.

7 Administrations shall require that records of daily hours of rest of seafarers be maintained in a standardized format\*, in the working language or languages of the ship and in English, to allow monitoring and verification of compliance with the provisions of this section. The seafarers shall receive a copy of the records pertaining to them, which shall be endorsed by the master or by a person authorized by the master and by the seafarers.

8 Nothing in this section shall be deemed to impair the right of the master of a ship to require a seafarer to perform any hours of work necessary for the immediate safety of the ship, persons on board or cargo, or for the purpose of giving assistance to other ships or persons in distress at sea. Accordingly, the master may suspend the schedule of hours of rest and require a seafarer to perform any hours of work necessary until the normal situation has been restored. As soon as practicable after the normal situation has been restored, the master shall ensure that

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\* The *IMO/ILO Guidelines for the development of tables of seafarers' shipboard working arrangements and formats of records of seafarers' hours of work or hours of rest* may be used.

any seafarers who have performed work in a scheduled rest period are provided with an adequate period of rest.

9 Parties may allow exceptions from the required hours of rest in paragraphs 2.2 and 3 above provided that the rest period is not less than 70 hours in any 7-day period.

Exceptions from the weekly rest period provided for in paragraph 2.2 shall not be allowed for more than two consecutive weeks. The intervals between two periods of exceptions on board shall not be less than twice the duration of the exception.

The hours of rest provided for in paragraph 2.1 may be divided into no more than three periods, one of which shall be at least 6 hours in length and neither of the other two periods shall be less than one hour in length. The intervals between consecutive periods of rest shall not exceed 14 hours. Exceptions shall not extend beyond two 24-hour periods in any 7-day period.

Exceptions shall, as far as possible, take into account the guidance regarding prevention of fatigue in section B-VIII/1.

10 Each Administration shall establish, for the purpose of preventing alcohol abuse, a limit of not greater than 0.05% blood alcohol level (BAC) or 0.25 mg/l alcohol in the breath or a quantity of alcohol leading to such alcohol concentration for masters, officers and other seafarers while performing designated safety, security and marine environmental duties.

## **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 PRINCIPLES IN GENERAL**

8 Watches shall be carried out based on the following bridge and engine-room resource management principles:

- .1 proper arrangements for watchkeeping personnel shall be ensured in accordance with the situations;
- .2 any limitation in qualifications or fitness of individuals shall be taken into account when deploying watchkeeping personnel;
- .3 understanding of watchkeeping personnel regarding their individual roles, responsibility and team roles shall be established;
- .4 the master, chief engineer officer and officer in charge of watch duties shall maintain a proper watch, making the most effective use of the resources available, such as information, installations/equipment and other personnel;
- .5 watchkeeping personnel shall understand functions and operation of installations/equipment, and be familiar with handling them;
- .6 watchkeeping personnel shall understand information and how to respond to information from each station/installation/equipment;
- .7 information from the stations/installations/equipment shall be appropriately shared by all the watchkeeping personnel;
- .8 watchkeeping personnel shall maintain an exchange of appropriate communication in any situation; and
- .9 watchkeeping personnel shall notify the master/chief engineer officer/officer in charge of watch duties without any hesitation when in any doubt as to what action to take in the interest of safety.

## **PART 4 – WATCHKEEPING AT SEA**

### **Principles applying to watchkeeping generally**

9 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.

10 The master of every ship is bound to ensure that watchkeeping arrangements are adequate for maintaining a safe navigational or cargo 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.

11 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**

12 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 4-1 – Principles to be observed in keeping a navigational watch***

13 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, as amended.

### **Lookout**

14 A proper lookout shall be maintained at all times in compliance with rule 5 of the International Regulations for Preventing Collisions at Sea, 1972, as amended 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.

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

16 The duties of the lookout and helmsperson are separate and the helmsperson shall not be considered to be the lookout 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 lookout. The officer in charge of the navigational watch may be the sole lookout 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.

17 In determining that the composition of the navigational watch is adequate to ensure that a proper lookout 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 routeing 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**

18 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 ECDIS, 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 their limitations; and
- .8 any unusual demands on the navigational watch that may arise as a result of special operational circumstances.

### **Taking over the watch**

19 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.

20 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.

21 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.



- 22 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.
- 23 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**

- 24 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; and
  - .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.
- 25 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.
- 26 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.

27 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.

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, 1972, as amended 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 shall be 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 lookout is maintained. In a ship with a separate chartroom, the officer in charge of the navigational watch may visit the chartroom, 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 lookout 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 lookout 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 the 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, or 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;
- .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;

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\* See SOLAS regulations V/24, V/25 and V/26.

- .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 lookout.

### **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 shall 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, as amended 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, as amended 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 lookout;
- .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 lookout 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. When using ECDIS, appropriate usage code (scale) electronic navigational charts shall be used and the ship's position shall be checked by an independent means of position fixing at appropriate intervals.

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 the 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 lookout 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 4-2 – Principles to be observed in keeping an engineering watch***

52 The term *engineering watch* as used in parts 4-2, 5-2 and 5-4 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, or 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 the 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, bypassing 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 cooperate 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 under way.

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 4-3 – 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 5 – 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 5-1 – Taking over the deck watch***

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

- .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 is adequate;
  - .2 the appropriate signals or lights are properly exhibited or sounded;
  - .3 safety measures and fire-protection regulations are being maintained;
  - .4 they are aware 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; and
  - .5 no external conditions or circumstances imperil the ship and that it does not imperil others.

***Part 5-2 – 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 5-3 – 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 5-4 – 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; and
- .5 ensure that all important events affecting the operation, adjustment or repair of the ship's machinery are satisfactorily recorded.

***Part 5-5 – 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.

***Part 5-6 – Cargo watch***

107 Officers with responsibility for the planning and conduct of cargo operations shall ensure that such operations are conducted safely through the control of the specific risks, including when non-ship's personnel are involved.”

2 The part B of the Seafarers' Training, Certification and Watchkeeping (STCW) Code is replaced by the following:

## **“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*

1 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-I/2 and B-II.

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*

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**

4 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.

5 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**

6 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 is provided regarding articles XII to XVII.)

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\* See MSC.1/Circ.1209 on simulators available for maritime training.

## 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.

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 “Regulation II/1”, if the seafarer has been found qualified to fill the capacity of officer in charge of a navigational watch;
  - .4.2 “Regulation 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 “Regulation IV/2”, if the seafarer has been found qualified to fill the capacity of radio operator;
- .4.4 “Regulation 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 “Regulations 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 chapter 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 this 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 this column should be those specified in the title to the STCW regulation or regulations concerned in the case of certificates issued under chapter 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 this space 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**

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)

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

..... .13 .....  
*Name of duly authorized official*

The original of this endorsement must be kept available in accordance with regulation I/2, paragraph 11 of the Convention while its holder is 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 the authorized official

Date of revalidation ..... .17

.....  
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 8). All entries made in the form are required to be in Roman characters and Arabic figures (see STCW regulation I/2, paragraph 10). 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 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 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.

(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**

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)

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

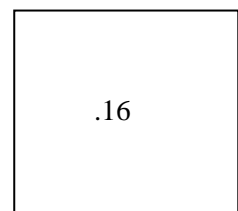
..... 13 .....  
*Name of duly authorized official*

The original of this endorsement must be kept available in accordance with regulation I/2, paragraph 11 of the Convention while its holder is 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 the authorized official

Date of revalidation ..... .17

.....  
Name of duly authorized official

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.

4 If an application for revalidation is made within six months before the expiry of an endorsement, the endorsement referred to in paragraphs 5, 6 and 7 of regulation I/2 may be revalidated until:

- .1 the fifth anniversary of the date of validity, or extension of the validity, of the endorsement; or
- .2 the date the certificate endorsed expires, whichever is earlier.

5 Where a Certificate of Proficiency is issued, it should contain at least the following information:

- .1 names of the issuing Party and authority;
- .2 number assigned to the certificate by the issuing authority;
- .3 full name and date of birth of the seafarer to whom the certificate is issued. The name and birthdate should be the same as that appearing in the seafarer's passport or seafarer's identification document;
- .4 title of the certificate. For example, if the certificate is issued in relation to regulation VI/3, paragraph 2, the title used should be "advanced fire fighting" and if it is issued in relation to regulation VI/5, paragraph 1, the title used should be "ship security officer";

- .5 number, or numbers, of the Convention regulation(s) or of the STCW Code section under which the seafarer has been found qualified;
- .6 dates of issue and expiry of the certificate. If the validity of the certificate is unlimited, then, for the benefit of clarification, the “unlimited” term should be entered in front of the date of expiry;
- .7 if applicable, limitations, either general limitation (such as the requirement to wear corrective lenses), ship’s type limitation (such as “valid only for service on ships of GT<500”) or, voyage limitation (such as “valid only on near-coastal voyages”);
- .8 name and signature of the authorized person who issues the certificate;
- .9 photograph of the seafarer. The photograph should be a standard black and white or colour passport-type head and shoulders photograph;
- .10 if the certificate is intended to be revalidated, then the date of revalidation, extension of the validity, name and signature of the authorized person; and
- .11 the contact details of the issuing Authority.

Table B-I/2

**List of certificates or documentary evidence required under the STCW Convention**

The list below identifies all certificates or documentary evidence described in the Convention which authorize the holder to serve in certain functions on board ships. The certificates are subject to the requirements of regulation I/2 regarding language and their availability in original form.

The list also references the relevant regulations and the requirements for endorsement, registration and revalidation.

<b>Regulations</b>	<b>Type of certificate and brief description</b>	<b>Endorsement attesting recognition of a certificate<sup>1</sup></b>	<b>Registration required<sup>2</sup></b>	<b>Revalidation of certificate<sup>3</sup></b>
II/1, II/2, II/3, III/1, III/2, III/3, III/6, IV/2, VII/2	Certificate of Competency – For masters, officers and GMDSS radio operators	Yes	Yes	Yes
II/4, III/4, VII/2	Certificate of Proficiency – For ratings duly certified to be a part of a navigational or engine-room watch	No	Yes	No
II/5, III/5, III/7, VII/2	Certificate of Proficiency – For ratings duly certified as able seafarer deck, able seafarer engine or electro-technical rating	No	Yes	No
V/1-1, V/1-2	Certificate of Proficiency or endorsement to a Certificate of Competency – For masters and officers on oil, chemical or liquefied gas tankers	Yes	Yes	Yes
V/1-1, V/1-2	Certificate of Proficiency – For ratings on oil, chemical or liquefied gas tankers	No	Yes	No
V/2	Documentary evidence – Training for masters, officers, ratings and other personnel serving on passenger ships	No	No	No <sup>4</sup>
VI/1	Certificate of Proficiency <sup>5</sup> – Basic training	No	Yes	Yes <sup>6</sup>
VI/2	Certificate of Proficiency <sup>5</sup> – Survival craft, rescue boats and fast rescue boats	No	Yes	Yes <sup>6</sup>
VI/3	Certificate of Proficiency <sup>5</sup> – Advanced fire fighting	No	Yes	Yes <sup>6</sup>
VI/4	Certificate of Proficiency <sup>5</sup> – Medical first aid and medical care	No	Yes	No
VI/5	Certificate of Proficiency – Ship security officer	No	Yes	No
VI/6	Certificate of Proficiency <sup>7</sup> – Security awareness training or security training for seafarers with designated security duties	No	Yes	No

**Notes:**

- 1 *Endorsement attesting recognition of a certificate* means endorsement in accordance with regulation I/2, paragraph 7.
- 2 *Registration required* means as part of register or registers in accordance with regulation I/2, paragraph 14.
- 3 *Revalidation of a certificate* means establishing continued professional competence in accordance with regulation I/11 or maintaining the required standards of competence in accordance with sections A-VI/1 to A-VI/3, as applicable.
- 4 As required by regulation V/2, paragraph 3 seafarers who have completed training in “crowd management”, “crisis management and human behaviour” or “passenger safety, cargo safety and hull integrity” shall at intervals not exceeding five years, undertake appropriate refresher training or to provide evidence of having achieved the required standards of competence within the previous five years.
- 5 The certificates of competency issued in accordance with regulations II/1, II/2, II/3, III/1, III/2, III/3, III/6 and VII/2 include the proficiency requirements in “basic training”, “survival craft and rescue boats other than fast rescue boats”, “advanced fire fighting” and “medical first aid” therefore, holders of mentioned certificates of competency are not required to carry Certificates of Proficiency in respect of those competences of chapter VI.
- 6 In accordance with sections A-VI/1, A-VI/2 and A-VI/3, seafarers shall provide evidence of having maintained the required standards of competence every five years.
- 7 Where security awareness training or training in designated security duties is not included in the qualification for the certificate to be issued.

**Section B-I/3***Guidance regarding near-coastal voyages*

Coastal States may adopt regional “near-coastal voyage limits” through bilateral or multilateral arrangements. Details of such arrangements shall be reported to the Secretary-General, who shall circulate such particulars to all 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, secure 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 onboard safety, security and pollution prevention.

**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)

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

\*\* See the Code of International Standards and Recommended Practices for a Safety Investigation into a marine casualty or marine incident (Casualty Investigation Code)



## **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 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\*.

#### **Use of distance learning and e-learning**

6 Parties may allow the training of seafarers by distance learning and e-learning in accordance with the standards of training and assessment set out in section A-I/6 and the guidance given below.

#### **Guidance for training by distance learning and e-learning**

7 Each Party should ensure that any distance learning and e-learning programme:

- .1 is provided by an entity that is approved by the Party;
- .2 is suitable for the selected objectives and training tasks to meet the competence level for the subject covered;
- .3 has clear and unambiguous instructions for the trainees to understand how the programme operates;
- .4 provides learning outcomes that meet all the requirements to provide the underpinning knowledge and proficiency of the subject;

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

- .5 is structured in a way that enables the trainee to systematically reflect on what has been learnt through both self assessment and tutor-marked assignments; and
- .6 provides professional tutorial support through telephone, facsimile or e-mail communications.

8 Companies should ensure that a safe learning environment is provided and that there has been sufficient time provided to enable the trainee to study.

9 Where e-learning is provided, common information formats such as XML (Extensible Markup Language), which is a flexible way to share both the format and the data on the World Wide Web, intranets, and elsewhere, should be used.

10 The e-learning system should be secured from tampering and attempts to hack into the system.

### **Guidance for assessing a trainee's progress and achievements by training by distance learning and e-learning**

11 Each Party should ensure that approved assessment procedures are provided for any distance learning and e-learning programme, including:

- .1 clear information to the trainees on the way that tests and examinations are conducted and how the results are communicated;
- .2 have test questions that are comprehensive and will adequately assess a trainee's competence and are appropriate to the level being examined;
- .3 procedures in place to ensure questions are kept up to date;
- .4 the conditions where the examinations can take place and the procedures for invigilation to be conducted;
- .5 secure procedures for the examination system so that it will prevent cheating; and
- .6 secure validation procedures to record results for the benefit of the Party.

### **Register of approved training providers, courses and programmes**

12 Each Party should ensure that a register or registers of approved training providers, courses and programmes are maintained and made available to companies and other Parties on request.

### **Section B-I/7**

#### *Guidance regarding communication of information*

### **Reports of difficulties encountered**

1 Parties are encouraged, when communicating information in accordance with article IV and regulation I/7 of the Convention, to include an index specifically locating the required information as follows:

**Index of materials submitted in accordance with  
article IV and regulation I/7 of the STCW Convention**

**Article IV of the STCW Convention** **Location**

- 1 Text of laws, decrees, orders, regulations and instruments  
(article IV(1)(a))
- 2 Details on study courses  
(article IV(1)(b))
- 3 National examination and other requirements  
(article IV(1)(b))
- 4 Specimen certificates  
(article IV(1)(c))

**Section A-I/7 part 1 of the STCW Code** **Location**

- 5 Information on Governmental organization  
(section A-I/7, paragraph 2.1)
- 6 Explanation of legal and administrative measures  
(section A-I/7, paragraph 2.2)
- 7 Statement of the education, training, examination, assessment  
and certification policies  
(section A-I/7, paragraph 2.3)
- 8 Summary of the courses, training programmes, examinations and  
assessments by certificate  
(section A-I/7, paragraph 2.4)
- 9 Outline of the procedures and conditions for authorizations,  
accreditations and approvals  
(section A-I/7, paragraph 2.5)
- 10 List of authorizations, accreditations and approvals granted  
(section A-I/7, paragraph 2.5)
- 11 Summary of procedures for dispensations  
(section A-I/7, paragraph 2.6)
- 12 Comparison carried out pursuant to regulation I/11  
(section A-I/7, paragraph 2.7)
- 13 Outline of refresher and upgrading training mandated  
(section A-I/7, paragraph 2.7)

**Section A-I/7, part 2, paragraph 3 of the STCW Code****Location**

- 14 Description of equivalency arrangements adopted pursuant to article IX  
(section A-I/7, paragraph 3.1)
- 15 Summary of measures taken to ensure compliance with regulation I/10  
(section A-I/7, paragraph 3.2)
- 16 Specimen copy of safe manning documents issued to ships employing seafarers holding alternative certificates under regulation VII/1  
(section A-I/7, paragraph 3.3)

**Section A-I/7, part 2, paragraph 4 of the STCW Code****Location**

- 17 Report of results of independent evaluations carried out pursuant to regulation I/8 covering:
- .1 Terms of reference of evaluators for the independent evaluation
  - .2 Qualifications and experience of evaluators
  - .3 Date and scope of evaluation
  - .4 Non-conformities found
  - .5 Corrective measures recommended
  - .6 Corrective measures carried out
  - .7 List of training institutions/centres covered by the independent evaluation

**Section A-I/7, part 2, paragraph 6 of the STCW Code****Location**

- 18 Explanation of legal and administrative measures  
(section A-I/7, paragraph 6.1)
- 19 Statement of the education, training, examination, assessment and certification policies  
(section A-I/7, paragraph 6.2)
- 20 Summary of the courses, training programmes, examinations and assessments by certificate  
(section A-I/7, paragraph 6.3)
- 21 Outline of refresher and upgrading training mandated  
(section A-I/7, paragraph 6.4)
- 22 Comparison carried out pursuant to regulation I/11  
(section A-I/7, paragraph 6.5)

2 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.

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-I/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-I/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 to be deficient, offer suggestions for improvement and provide any other comments the evaluators consider relevant.

## Section B-I/9

### *Guidance regarding medical standards*

## MEDICAL EXAMINATION AND CERTIFICATION

1 Parties, in establishing seafarer medical fitness standards and provisions, should take into account the minimum physical abilities set out in table B-I/9 and the guidance given within this section, bearing in mind the different duties of seafarers.

2 Parties, in establishing seafarer medical fitness standards and provisions, should follow the guidance contained in the ILO/WHO publication *Guidelines for Conducting Pre-sea and Periodic Medical Fitness Examinations for Seafarers*, including any subsequent versions, and any other applicable international guidelines published by the International Labour Organization, the International Maritime Organization or the World Health Organization.

3 Appropriate qualifications and experience for medical practitioners conducting medical fitness examinations of seafarers may include occupational health or maritime health qualifications, experience of working as a ship's doctor or a shipping company doctor or working under the supervision of someone with the aforementioned qualifications or experience.

4 The premises where medical fitness examinations are carried out should have the facilities and equipment required to carry out medical fitness examination of seafarers.

5 Administrations should ensure that recognized medical practitioners enjoy full professional independence in exercising their medical judgement when undertaking medical examination procedures.

6 Persons applying for a medical certificate should present to the recognized medical practitioner appropriate identity documentation to establish their identity. They should also surrender their previous medical certificate.



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.

8 The medical fitness 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 that are controlled by medication may be allowed to continue to serve at sea.

9 The medical standards should also identify particular medical conditions, such as colour blindness, which might preclude seafarers holding particular positions on board ship.

10 The minimum in-service eyesight standards in each eye for unaided distance vision should be at least 0.1\*.

11 Persons requiring the use of spectacles or contact lenses to perform duties should have a spare pair or pairs, as required, conveniently available on board the ship. Any need to wear visual aids to meet the required standards should be recorded on the medical fitness certificate issued.

12 Colour vision testing should be in accordance with the *International Recommendation for Colour Vision Requirements for Transport*, published by the Commission Internationale de l'Eclairage (CIE 143-2001 including any subsequent versions) or equivalent test methods.

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\* Value given in Snellen decimal notation.

Table B-I/9

**Assessment of minimum entry level and in-service physical abilities for seafarers<sup>3</sup>**

<b>Shipboard task, function, event or condition<sup>3</sup></b>	<b>Related physical ability</b>	<b>A medical examiner should be satisfied that the candidate<sup>4</sup></b>
Routine movement around vessel: <ul style="list-style-type: none"> <li>- on moving deck</li> <li>- between levels</li> <li>- between compartments</li> </ul> <i>Note 1 applies to this row</i>	Maintain balance and move with agility Climb up and down vertical ladders and stairways Step over coamings (e.g., Load Line Convention requires coamings to be 600 mm high) Open and close watertight doors	Has no disturbance in sense of balance Does not have any impairment or disease that prevents relevant movements and physical activities  Is, without assistance <sup>5</sup> , able to: <ul style="list-style-type: none"> <li>- climb vertical ladders and stairways</li> <li>- step over high sills</li> <li>- manipulate door closing systems</li> </ul>
Routine tasks on board: <ul style="list-style-type: none"> <li>- Use of hand tools</li> <li>- Movement of ship's stores</li> <li>- Overhead work</li> <li>- Valve operation</li> <li>- Standing a four-hour watch</li> <li>- Working in confined spaces</li> <li>- Responding to alarms, warnings and instructions</li> <li>- Verbal communication</li> </ul> <i>Note 1 applies to this row</i>	Strength, dexterity and stamina to manipulate mechanical devices Lift, pull and carry a load (e.g., 18 kg)  Reach upwards Stand, walk and remain alert for an extended period  Work in constricted spaces and move through restricted openings (e.g., SOLAS requires minimum openings in cargo spaces and emergency escapes to have the minimum dimensions of 600 mm × 600 mm – SOLAS regulation 3.6.5.1)  Visually distinguish objects, shapes and signals Hear warnings and instructions Give a clear spoken description	Does not have a defined impairment or diagnosed medical condition that reduces ability to perform routine duties essential to the safe operation of the vessel  Has ability to: <ul style="list-style-type: none"> <li>- work with arms raised</li> <li>- stand and walk for an extended period</li> <li>- enter confined space</li> <li>- fulfil eyesight standards (table A-I/9)</li> <li>- fulfil hearing standards set by competent authority or take account of international guidelines</li> <li>- hold normal conversation</li> </ul>

<b>Shipboard task, function, event or condition<sup>3</sup></b>	<b>Related physical ability</b>	<b>A medical examiner should be satisfied that the candidate<sup>4</sup></b>
Emergency duties <sup>6</sup> on board: - Escape - Fire-fighting - Evacuation  <i>Note 2 applies to this row</i>	Don a lifejacket or immersion suit Escape from smoke-filled spaces  Take part in fire-fighting duties, including use of breathing apparatus Take part in vessel evacuation procedures	Does not have a defined impairment or diagnosed medical condition that reduces ability to perform emergency duties essential to the safe operation of the vessel  Has ability to: - don lifejacket or immersion suit - crawl - feel for differences in temperature - handle fire-fighting equipment - wear breathing apparatus (where required as part of duties)

Notes:

- 1 Rows 1 and 2 of the above table describe (a) ordinary shipboard tasks, functions, events and conditions, (b) the corresponding physical abilities which may be considered necessary for the safety of a seafarer, other crew members and the ship, and (c) high-level criteria for use by medical practitioners assessing medical fitness, bearing in mind the different duties of seafarers and the nature of shipboard work for which they will be employed.
- 2 Row 3 of the above table describes (a) ordinary shipboard tasks, functions, events and conditions, (b) the corresponding physical abilities which should be considered necessary for the safety of a seafarer, other crew members and the ship, and (c) high-level criteria for use by medical practitioners assessing medical fitness, bearing in mind the different duties of seafarers and the nature of shipboard work for which they will be employed.
- 3 This table is not intended to address all possible shipboard conditions or potentially disqualifying medical conditions. Parties should specify physical abilities applicable to the category of seafarers (such as “Deck officer” and “Engine rating”). The special circumstances of individuals and for those who have specialized or limited duties should receive due consideration.
- 4 If in doubt, the medical practitioner should quantify the degree or severity of any relevant impairment by means of objective tests, whenever appropriate tests are available, or by referring the candidate for further assessment.
- 5 The term “assistance” means the use of another person to accomplish the task.
- 6 The term “emergency duties” is used to cover all standard emergency response situations such as abandon ship or fire fighting as well as the procedures to be followed by each seafarer to secure personal survival.

**Section B-I/10***Guidance regarding the recognition of certificates*

1 Training carried out under the STCW Convention which does not lead to the issue of a certificate of competency and on which information provided by a Party is found by the Maritime Safety Committee to give full and complete effect to the Convention in accordance with regulation I/7, paragraph 2 may be accepted by other Parties to the Convention as meeting the relevant training requirements thereof.

2 Contacted Administrations should issue the documentary proof referred to in regulation I/10, paragraph 5 to enable port State control authorities to accept the same in lieu of endorsement of a certificate issued by another Party for a period of three months from the date of issue, providing the information listed below:

- .1 seafarer's name
- .2 date of birth
- .3 number of the original Certificate of Competency
- .4 capacity
- .5 limitations
- .6 contact details of the Administration
- .7 dates of issue and expiry.

3 Such documentary proof may be made available by electronic means.

**Section B-I/11***Guidance regarding the revalidation of certificates*

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

2 A test may take the form of written or oral examination, the use of a simulator or other appropriate means.

3 Approved seagoing service stated in section A-I/11, paragraph 1 may be served in an appropriate lower officer rank than that stated in the certificate held.

4 If an application for revalidation of a certificate referred to in paragraph 1 of regulation I/11 is made within six months before expiry of the certificate, the certificate may be revalidated until the fifth anniversary of the date of validity, or extension of the validity, of the certificate.

**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.

### ***General***

#### **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, 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 antennae and open waveguides.

#### **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;

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

\*\* See relevant/appropriate performance standards adopted by the Organization.

- .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.

### *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 the 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;
    - .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 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, 1972, as amended**

17 A thorough understanding should be attained of the relationship of the International Regulations for Preventing Collisions at Sea, 1972, as amended 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 35 below;\*

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\* The relevant IMO Model Course(s) and resolution MSC.64(67), as amended, may be of assistance in the preparation of courses.

- .2 incorporate the use of ARPA simulation equipment; and
- .3 conform to standards not inferior to those given in paragraphs 19 to 35 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, including ECDIS. 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.

#### **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.

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\* See relevant/appropriate performance standards adopted by the Organization.

### **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; and
  - .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.

### **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 positions 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 timescale 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, 1972, as amended**

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, 1972, as amended, in force.

**TRAINING AND ASSESSMENT IN THE OPERATIONAL USE OF ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEMS (ECDIS)**

*Introduction*

36 When simulators are being used for training or assessment in the operational use of Electronic Chart Display and Information Systems (ECDIS), the following interim guidance should be taken into consideration in any such training or assessment.

37 Training and assessment in the operational use of the ECDIS should:

- .1 incorporate the use of ECDIS simulation equipment; and
- .2 conform to standards not inferior to those given in paragraphs 38 to 65 below.

38 ECDIS simulation equipment should, in addition to meeting all applicable performance standards set out in section A-I/12 of the STCW Code, as amended, 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; and
- .2 realistically simulate "own ship" characteristics in open-water conditions, as well as the effects of weather, tidal stream and currents.

39 Demonstrations of, and practice in, ECDIS use should be undertaken, where appropriate, through the use of simulators. Training exercises should preferably be undertaken in real time, in order to increase trainees' awareness of the hazards of the improper use of ECDIS. Accelerated timescale may be used only for demonstrations.

## **General**

### **Goals of an ECDIS training programme**

- 40 The ECDIS trainee should be able to:
- .1 operate the ECDIS equipment, use the navigational functions of ECDIS, select and assess all relevant information and take proper action in the case of a malfunction;
  - .2 state the potential errors of displayed data and the usual errors of interpretation; and
  - .3 explain why ECDIS should not be relied upon as the sole reliable aid to navigation.

### **Theory and demonstration**

41 As the safe use of ECDIS requires knowledge and understanding of the basic principles governing ECDIS data and their presentation rules as well as potential errors in displayed data and ECDIS-related limitations and potential dangers, a number of lectures covering the theoretical explanation should be provided. As far as possible, such lessons should be presented within a familiar context and make use of practical examples. They should be reinforced during simulator exercises.

42 For safe operation of ECDIS equipment and ECDIS-related information (use of the navigational functions of ECDIS, selection and assessment of all relevant information, becoming familiar with ECDIS man-machine interfacing), practical exercises and training on the ECDIS simulators should constitute the main content of the course.

43 For the definition of training objectives, a structure of activities should be defined. A detailed specification of learning objectives should be developed for each topic of this structure.

### **Simulator exercises**

44 Exercises should be carried out on individual ECDIS simulators, or full-mission navigation simulators including ECDIS, to enable trainees to acquire the necessary practical skills. For real-time navigation exercises, navigation simulators are recommended to cover the complex navigation situation. The exercises should provide training in the use of the various scales, navigational modes, and display modes which are available, so that the trainees will be able to adapt the use of the equipment to the particular situation concerned.

45 The choice of exercises and scenarios is governed by the simulator facilities available. If one or more ECDIS workstations and a full-mission simulator are available, the workstations may primarily be used for basic exercises in the use of ECDIS facilities and for passage-planning exercises, whereas full-mission simulators may primarily be used for exercises related to passage-monitoring functions in real time, as realistic as possible in connection with the total workload of a navigational watch. The degree of complexity of exercises should increase throughout the training programme until the trainee has mastered all aspects of the learning subject.

46 Exercises should produce the greatest impression of realism. To achieve this, the scenarios should be located in a fictitious sea area. Situations, functions and actions for different

learning objectives which occur in different sea areas can be integrated into one exercise and experienced in real time.

47 The main objective of simulator exercises is to ensure that trainees understand their responsibilities in the operational use of ECDIS in all safety-relevant aspects and are thoroughly familiar with the system and equipment used.

### **Principal types of ECDIS systems and their display characteristics**

48 The trainee should gain knowledge of the principal types of ECDIS in use; their various display characteristics, data structure and an understanding of:

- .1 differences between vector and raster charts;
- .2 differences between ECDIS and ECS;
- .3 differences between ECDIS and RCDS\*;
- .4 characteristics of ECDIS and their different solutions; and
- .5 characteristics of systems for special purposes (unusual situations/emergencies).

### **Risks of over-reliance on ECDIS**

49 The training in ECDIS operational use should address:

- .1 the limitations of ECDIS as a navigational tool;
- .2 potential risk of improper functioning of the system;
- .3 system limitations, including those of its sensors;
- .4 hydrographic data inaccuracy; limitations of vector and raster electronic charts (ECDIS vs RCDS and ENC vs RNC); and
- .5 potential risk of human errors.

Emphasis should be placed on the need to keep a proper look-out and to perform periodical checking, especially of the ship's position, by ECDIS-independent methods.

### **Detection of misrepresentation of information**

50 Knowledge of the limitations of the equipment and detection of misrepresentation of information is essential for the safe use of ECDIS. The following factors should be emphasized during training:

- .1 performance standards of the equipment;
- .2 radar data representation on an electronic chart, elimination of discrepancy between the radar image and the electronic chart;

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\* SN/Circ.207/Rev.1 – Differences between RCDS and ECDIS.

- .3 possible projection discrepancies between an electronic and paper charts;
- .4 possible scale discrepancies (overscaling and underscaling) in displaying an electronic chart and its original scale;
- .5 effects of using different reference systems for positioning;
- .6 effects of using different horizontal and vertical datums;
- .7 effects of the motion of the ship in a seaway;
- .8 ECDIS limitations in raster chart display mode;
- .9 potential errors in the display of:
  - .9.1 the own ship's position;
  - .9.2 radar data and ARPA and AIS information;
  - .9.3 different geodetic coordinate systems; and
- .10 verification of the results of manual or automatic data correction:
  - .10.1 comparison of chart data and radar picture; and
  - .10.2 checking the own ship's position by using the other independent position-fixing systems.

51 False interpretation of the data and proper action taken to avoid errors of interpretation should be explained. The implications of the following should be emphasized:

- .1 ignoring overscaling of the display;
- .2 uncritical acceptance of the own ship's position;
- .3 confusion of display mode;
- .4 confusion of chart scale;
- .5 confusion of reference systems;
- .6 different modes of presentation;
- .7 different modes of vector stabilization;
- .8 differences between true north and gyro north (radar);
- .9 using the same data reference system;
- .10 using the appropriate chart scale;
- .11 using the best-suited sensor to the given situation and circumstances;



- .12 entering the correct values of safety data:
  - .12.1 the own ship's safety contour,
  - .12.2 safety depth (safe water), and
  - .12.3 events; and
- .13 proper use of all available data.

52 Appreciation that RCDS is only a navigational aid and that, when operating in the RCDS mode, the ECDIS equipment should be used together with an appropriate portfolio of up-to-date paper charts:

- .1 appreciation of the differences in operation of RCDS mode as described in SN.1/Circ.207/Rev.1 "Differences between RCDS and ECDIS"; and
- .2 ECDIS, in any mode, should be used in training with an appropriate portfolio of up-to-date charts.

### **Factors affecting system performance and accuracy**

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

- .1 starting and setting up ECDIS; connecting data sensors: satellite and radio navigation system receivers, radar, gyro-compass, log, echo-sounder; accuracy and limitations of these sensors, including effects of measurement errors and ship's position accuracy, manoeuvring on the accuracy of course indicator's performance, compass error on the accuracy of course indication, shallow water on the accuracy of log performance, log correction on the accuracy of speed calculation, disturbance (sea state) on the accuracy of an echo-sounder performance; and
- .2 the current performance standards for electronic chart display and information systems adopted by the Organization\* .

### ***Practice***

#### **Setting up and maintaining display**

54 Knowledge and skills should be attained in:

- .1 the correct starting procedure to obtain the optimum display of ECDIS information;
- .2 the selection of display presentation (standard display, display base, all other information displayed individually on demand);

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\* See relevant/appropriate performance standards adopted by the Organization.

- .3 the correct adjustment of all variable radar/ARPA display controls for optimum display of data;
- .4 the selection of convenient configuration;
- .5 the selection, as appropriate, of required speed input to ECDIS;
- .6 the selection of the timescale of vectors; and
- .7 performance checks of position, radar/ARPA, compass, speed input sensors and ECDIS.

### **Operational use of electronic charts**

55 Knowledge and skills should be attained in:

- .1 the main characteristics of the display of ECDIS data and selecting proper information for navigational tasks;
- .2 the automatic functions required for monitoring ship's safety, such as display of position, heading/gyro course, speed, safety values and time;
- .3 the manual functions (by the cursor, electronic bearing line, range rings);
- .4 selecting and modification of electronic chart content;
- .5 scaling (including underscaling and overscaling);
- .6 zooming;
- .7 setting of the own ship's safety data;
- .8 using a daytime or night-time display mode;
- .9 reading all chart symbols and abbreviations;
- .10 using different kinds of cursors and electronic bars for obtaining navigational data;
- .11 viewing an area in different directions and returning to the ship's position;
- .12 finding the necessary area, using geographical coordinates;
- .13 displaying indispensable data layers appropriate to a navigational situation;
- .14 selecting appropriate and unambiguous data (position, course, speed, etc.);
- .15 entering the mariner's notes;
- .16 using north-up orientation presentation and other kinds of orientation; and
- .17 using true- and relative-motion modes.

## **Route planning**

- 56 Knowledge and skills should be attained in:
- .1 loading the ship's characteristics into ECDIS;
  - .2 selection of a sea area for route planning:
    - .2.1 reviewing required waters for the sea passage, and
    - .2.2 changing over of chart scale;
  - .3 verifying that proper and updated charts are available;
  - .4 route planning on a display by means of ECDIS, using the graphic editor, taking into consideration rhumb line and great-circle sailing:
    - .4.1 using the ECDIS database for obtaining navigational, hydro-meteorological and other data;
    - .4.2 taking into consideration turning radius and wheel-over points/lines when they are expressed on chart scale;
    - .4.3 marking dangerous depths and areas and exhibiting guarding depth contours;
    - .4.4 marking waypoints with the crossing depth contours and critical cross-track deviations, as well as by adding, replacing and erasing of waypoints;
    - .4.5 taking into consideration safe speed;
    - .4.6 checking pre-planned route for navigational safety; and
    - .4.7 generating alarms and warnings;
  - .5 route planning with calculation in the table format, including:
    - .5.1 waypoints selection;
    - .5.2 recalling the waypoints list;
    - .5.3 planning notes;
    - .5.4 adjustment of a planned route;
    - .5.5 checking a pre-planned route for navigational safety;
    - .5.6 alternative route planning;
    - .5.7 saving planned routes, loading and unloading or deleting routes;
    - .5.8 making a graphic copy of the monitor screen and printing a route;

- .5.9 editing and modification of the planned route;
- .5.10 setting of safety values according to the size and manoeuvring parameters of the vessel;
- .5.11 back-route planning; and
- .5.12 connecting several routes.

### **Route monitoring**

57 Knowledge and skills should be attained in:

- .1 using independent data to control ship's position or using alternative systems within ECDIS;
- .2 using the look-ahead function:
  - .2.1 changing charts and their scales;
  - .2.2 reviewing navigational charts;
  - .2.3 vector time selecting;
  - .2.4 predicting the ship's position for some time interval;
  - .2.5 changing the pre-planned route (route modification);
  - .2.6 entering independent data for the calculation of wind drift and current allowance;
  - .2.7 reacting properly to the alarm;
  - .2.8 entering corrections for discrepancies of the geodetic datum;
  - .2.9 displaying time markers on a ship's route;
  - .2.10 entering ship's position manually; and
  - .2.11 measuring coordinates, course, bearings and distances on a chart.

### **Alarm handling**

58 Knowledge and ability to interpret and react properly to all kinds of systems, such as navigational sensors, indicators, data and charts alarms and indicator warnings, including, switching the sound and visual alarm signalling system, should be attained in case of:

- .1 absence of the next chart in the ECDIS database;
- .2 crossing a safety contour;
- .3 exceeding cross-track limits;
- .4 deviation from planned route;

- .5 approaching a waypoint;
- .6 approaching a critical point;
- .7 discrepancy between calculated and actual time of arrival to a waypoint;
- .8 information on under-scaling or over-scaling;
- .9 approaching an isolated navigational danger or danger area;
- .10 crossing a specified area;
- .11 selecting a different geodetic datum;
- .12 approaching other ships;
- .13 watch termination;
- .14 switching timer;
- .15 system test failure;
- .16 malfunctioning of the positioning system used in ECDIS;
- .17 failure of dead-reckoning; and
- .18 inability to fix vessel's position using the navigational system.

**Manual correction of a ship's position and motion parameters**

- 59 Knowledge and skills should be attained in manually correcting:
- .1 the ship's position in dead-reckoning mode, when the satellite and radio navigation system receiver is switched off;
  - .2 the ship's position, when automatically obtained coordinates are inaccurate; and
  - .3 course and speed values.

**Records in the ship's log**

- 60 Knowledge and skills should be attained in:
- .1 automatic voyage recording;
  - .2 reconstruction of past track, taking into account:
    - .2.1 recording media;
    - .2.2 recording intervals;
    - .2.3 verification of database in use;

- .3 viewing records in the electronic ship's log;
- .4 instant recording in the electronic ship's log;
- .5 changing ship's time;
- .6 entering the additional data;
- .7 printing the content of the electronic ship's log;
- .8 setting up the automatic record time intervals;
- .9 composition of voyage data and reporting; and
- .10 interface with a voyage data recorder (VDR).

### **Chart updating**

61 Knowledge and skills should be attained in:

- .1 performing manual updating of electronic charts. Special attention should be paid to reference-ellipsoid conformity and to conformity of the measurement units used on a chart and in the correction text;
- .2 performing semi-automatic updating of electronic charts, using the data obtained on electronic media in the electronic chart format; and
- .3 performing automatic updating of electronic charts, using update files obtained via electronic data communication lines.

In the scenarios where non-updated data are employed to create a critical situation, trainees should be required to perform *ad hoc* updating of the chart.

### **Operational use of ECDIS where radar/ARPA is connected**

62 Knowledge and skills should be attained in:

- .1 connecting ARPA to ECDIS;
- .2 indicating target's speed vectors;
- .3 indicating target's tracks;
- .4 archiving target's tracks;
- .5 viewing the table of the targets;
- .6 checking alignment of radar overlay with charted geographic features;
- .7 simulating one or more manoeuvres;
- .8 corrections to own ship's position, using a reference point captured by ARPA; and
- .9 corrections using the ARPA's cursor and electronic bar.

See also section B-I/12, Guidance regarding the use of simulators (pertaining to radar and ARPA), especially paragraphs 17 to 19 and 36 to 38.

### **Operational use of ECDIS where AIS is connected**

63 Knowledge and skills should be attained in:

- .1 interface with AIS;
- .2 interpretation of AIS data;
- .3 indicating target's speed vectors;
- .4 indicating target's tracks; and
- .5 archiving target's tracks.

### **Operational warnings, their benefits and limitations**

64 Trainees should gain an appreciation of the uses, benefits and limitations of ECDIS operational warnings and their correct setting, where applicable, to avoid spurious interference.

### **System operational tests**

65 Knowledge and skills should be attained in:

- .1 methods of testing for malfunctions of ECDIS, including functional self-testing;
- .2 precautions to be taken after a malfunction occurs; and
- .3 adequate back-up arrangements (take over and navigate using the back-up system).

### **Debriefing exercise**

66 The instructor should analyze the results of all exercises completed by all trainees and print them out. The time spent on the debriefing should occupy between 10% and 15% of the total time used for simulator exercises.

### **RECOMMENDED PERFORMANCE STANDARDS FOR NON-MANDATORY TYPES OF SIMULATION**

67 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 ship handling and manoeuvring;
- .3 cargo handling and stowage;
- .4 reporting and radiocommunications; and
- .5 main and auxiliary machinery operation.

***Navigation and watchkeeping simulation***

68 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,<sup>\*</sup> 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;
- .3 realistically simulate “own ship” dynamics in open-water conditions, including the effects of weather, tidal stream, currents and interaction with other ships; and
- .4 realistically simulate VTS communication procedures between ship and shore.

***Ship handling and manoeuvring simulation***

69 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 ship handling and manoeuvring training tasks and objectives;<sup>\*\*</sup> and
- .2 realistically simulate “own ship” dynamics in restricted waterways, including shallow-water and bank effects.

70 Where manned scale models are used to provide ship handling and manoeuvring simulation, in addition to the performance standards set out in paragraphs 68.3 and 69.2, 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 timescale.

***Cargo handling and stowage simulation***

71 Cargo handling simulation equipment should be capable of simulating cargo handling and control equipment which meets all applicable performance standards adopted by the Organization<sup>\*\*\*</sup> and incorporate facilities to:

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\* See relevant/appropriate performance standards adopted by the Organization.

\*\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

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



- .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***

72 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:

- .1 simulate the operation of VHF, VHF-DSC, NAVTEX, EPIRB and watch receiver equipment as required for the Restricted Operator's 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***

73 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;

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

\*\* See relevant/appropriate performance standards adopted by the Organization.

- .5 allow for the variable external conditions to be changed so as to influence the simulated operations: weather, ship's draught, seawater and air temperatures;
- .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. Companies should also ensure that:

- .1 all seafarers on a ship fitted with free-fall lifeboats should receive familiarization training in boarding and launching procedures for such lifeboats;
- .2 prior to joining a ship, seafarers assigned as operating crew of free-fall lifeboats should have undergone appropriate training in boarding, launching and recovering of such lifeboats, including participation on at least one occasion in a free-fall launch; and
- .3 personnel who may be required to operate the GMDSS equipment receive GMDSS familiarization training, on joining the ship and at appropriate intervals thereafter.

2 The familiarization training required by paragraph 3 of section A-I/14 should 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.

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

*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.

**Master**

3 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;
  - .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**

4 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.

5 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 practice 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 onboard training should be an integral part of the overall training plan.
- .2 The programme of onboard training should be managed and coordinated 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 onboard training has been completed which can be taken into account in the process of evaluating competence for the issue of a certificate.
- .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 onboard training. The first of these is a qualified seagoing officer,

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\* The relevant IMO Model Course(s) and a similar document produced by the International Shipping Federation may be of assistance in the preparation of training record books.

referred to as the “shipboard training officer”, who, under the authority of the master, should organize 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 coordination with colleges and training institutions.

- .5 The company should ensure that appropriate periods are set aside for completion of the programme of onboard training within the normal operational requirements of the ship.

### **Roles and responsibilities**

5 The following section summarizes the roles and responsibilities of those individuals involved in organizing and conducting onboard 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 onboard 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 onboard 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 onboard 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 nautical 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, ARPA and ECDIS 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 4-1) and the Guidance on keeping a navigational watch (section B-VIII/2, part 4-1).

### **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 ship's 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.

### **Training in celestial navigation**

19 The following areas summarize the recommended training in celestial navigation:

- .1 correctly adjust sextant for adjustable errors;
- .2 determine corrected reading of the sextant altitude of celestial bodies;
- .3 accurate sight reduction computation, using a preferred method;
- .4 calculate the time of meridian altitude of the sun;
- .5 calculate latitude by Polaris or by meridian altitude of the sun;
- .6 accurate plotting of position line(s) and position fixing;
- .7 determine time of visible rising/setting sun by a preferred method;
- .8 identify and select the most suitable celestial bodies in the twilight period;
- .9 determine compass error by azimuth or by amplitude, using a preferred method;
- .10 nautical astronomy as required to support the required competence in paragraphs 19.1 to 19.9 above.

20 Training in celestial navigation may include the use of electronic nautical almanac and celestial navigation calculation software.

### **Section B-II/2**

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

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

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

**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 the training and certification of ratings forming part of a navigational watch*

1 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, 1972, as amended;
- .2 rigging a pilot ladder;
- .3 an understanding of wheel orders given by pilots in English;
- .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 of tools used on deck.

**Section B-II/5**

*Guidance regarding the certification of ratings as able seafarer deck*

Onboard training should be documented in an approved training record book.

## 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, 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 Onboard 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)

*Guidance regarding training of engineering personnel having management responsibilities for the operation and safety of electrical power plant above 1,000 volts*

1 Training of engineering personnel having management responsibilities for the operation and safety of electrical power plant of more than 1,000 V should at least include:

- .1 the functional, operational and safety requirements for a marine high-voltage system;
- .2 assignment of suitably qualified personnel to carry out maintenance and repair of high-voltage switchgear of various types;
- .3 taking remedial action necessary during faults in a high-voltage system;
- .4 producing a switching strategy for isolating components of a high-voltage system;
- .5 selecting suitable apparatus for isolation and testing of high-voltage equipment;
- .6 carrying out a switching and isolation procedure on a marine high-voltage system, complete with safety documentation; and
- .7 performing tests of insulation resistance and polarization index on high-voltage equipment.

**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*

1 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.

**Section B-III/5**

*Guidance regarding the certification of ratings as able seafarer engine*

Onboard training should be documented in an approved training record book.

**Section B-III/6**

*Guidance regarding training and certification for electro-technical officers*

In addition to the requirements stated in table A-III/6 of this Code, Parties are encouraged to take into account resolution A.702(17) concerning radio maintenance guidelines for the Global Maritime Distress and Safety System (GMDSS) within their training programmes.

**Section B-III/7**

*Guidance regarding training and certification for electro-technical ratings*

(No provisions)

## CHAPTER IV

### Guidance regarding radiocommunication and radio operators

#### 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 operators*

### 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 radio beacons (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;
- .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 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 International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual;
- .8 radio medical systems and procedures; and
- .9 causes of false distress alerts and means to avoid them.\*

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\* See COM/Circ.127 – Guidelines for avoiding false distress alerts.

**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;
  - .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 realignment, 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 semi-conductor 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 coordination 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 coordinated 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 telegraphy and radiotelephone transmitters and receivers, digital selective calling equipment, ship earth stations, emergency position-indicating radio beacons (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.

21 General knowledge of factors that affect system reliability, availability, maintenance procedures and proper use of test equipment.

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

- 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 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 International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual;

- .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 realignment, 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 replacement of a unit or module;
- .8 basic manual soldering and desoldering techniques and their limitations;
- .9 tracing and repair of faults to board/module level;
- .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.

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\* See COM/Circ.127 and IMO Assembly resolution A.814 (19) – Guidelines for avoiding false distress alerts.

**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 coordination 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 coordinated universal time (UTC), global time zones and the 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\*.

**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.

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

## **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 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 International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual;
  - .8 radio medical systems and procedures; and
  - .9 causes of false distress alerts and means to avoid them.\*

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\* See COM/Circ.127 and IMO Assembly resolution A.814 (19) – Guidelines for avoiding false distress alerts.

**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 realignment 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 coordination 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 coordinated universal time (UTC), global time zones and the 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;
  - .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 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;

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

- .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 International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual;
- .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 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 coordination centres (RCCs) and related communication routes;

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\* See COM/Circ.127 and IMO Assembly resolution A.814 (19) – Guidelines for avoiding false distress alerts.



- .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.

## 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*

#### Person with immediate responsibility

1 The term “person with immediate responsibility” as used in paragraphs 3 and 5 of regulation V/1-1 and paragraph 3 of regulation V/1-2 means a person being in a decision-making capacity with respect to loading, discharging, care in transit, handling of cargo, tank cleaning or other cargo-related operations.

#### FAMILIARIZATION TRAINING FOR ALL TANKER PERSONNEL

2 All tanker personnel should undergo familiarization training on board and, where appropriate, ashore before being assigned to shipboard duties, 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 3 to 8 below.

#### Regulations

3 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

4 Dangers of skin contact; inhalation and accidental swallowing of cargo; the harmful properties of the cargoes carried, personnel accidents and associated first aid; lists of do’s and don’ts.

#### Fire prevention and fire fighting

5 Control of smoking and cooking restrictions; sources of ignition; fire and explosion prevention; methods of fire fighting; portable fire extinguishers and fixed installations.

#### Pollution prevention

6 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

7 The proper use of protective clothing and equipment, resuscitators, escape and rescue equipment.

#### Emergency procedures

8 Familiarization with the emergency plan procedures.

## **PROOF OF QUALIFICATION**

9 The master of every oil, chemical and liquefied gas tanker should ensure that the officer or the person primarily responsible for the cargo possesses the appropriate certificate, issued or endorsed or validated as required by regulation V/1-1, paragraph 3; regulation V/1-1, paragraph 5 or regulation V/1-2, paragraph 3, as appropriate, and has had adequate recent practical experience on board an appropriate type of tanker to permit that officer or person to safely perform the duties assigned.

## **GUIDANCE REGARDING APPROVED ONBOARD TRAINING**

### **General**

10 The purpose of qualifying shipboard service is to provide training and knowledge for the safe carriage of specific tanker cargoes.

11 To satisfy the experience appropriate to their duties on the type of tanker on which they serve referred to in regulation V/1-1, paragraph 4.2.2, regulation V/1-1, paragraph 6.2.2 and regulation V/1-2, paragraph 4.2.2, onboard training should:

- .1 emphasize practical “hands on experience” and be related to the employment of the seafarer, i.e. the training of deck and engineering departments may be different;
- .2 be under the supervision of personnel qualified and experienced in the handling, characteristics and safety procedures of the cargoes being carried by the vessel;
- .3 be on board the tanker carrying products relative to the tanker Certificate of Proficiency/Endorsement being sought and should be such that the specialist equipment is brought into operation but may be on a ballast passage between cargoes for part of that period;
- .4 take part in at least three loading and discharge operations; and\*
- .5 at least cover the matters set out in “Onboard training criteria” in paragraph 19.

12 The onboard training programme must in no way affect the safe running or the seaworthiness of the vessel.

### **Onboard training programme**

13 The trainee should be carried in a supernumerary capacity (i.e. the trainee will have no other duties than that of undertaking the training programme and emergency duties).

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\* A loading or discharging operation is considered to be the loading or discharge of more than 60% of the total cargo tank capacity of the vessel. Loading/discharges of less than this quantity may be summed together to be equivalent to this quantity.

14 The programme of onboard training should be managed and coordinated by the company which manages the ship on which the seagoing service is to be performed and be a vessel nominated by the company as a training vessel.\*

15 At all times, the trainee should be aware of two identifiable individuals who are immediately responsible for the management of the programme of onboard 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 organize and supervise the programme of training. 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 coordination with training organizations.

16 The trainee should be provided with an approved training record book to enable a comprehensive record of practical training and experience at sea to be maintained. The approved 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 and countersigned by the master, the approved record book will provide unique evidence that a structured programme of onboard training has been completed leading towards the issue of a relevant Certificate in Advanced Training for Tanker Cargo Operations.

17 During the approved onboard training programme the trainee should be instructed in the loading, discharging, care in transit, handling of cargo, tank cleaning or other cargo-related operations of the tanker to ensure that the experience gained is at least equal to that which would be obtained in three months’ normal service.

18 If the three-loading and three-unloading criteria cannot be achieved within the one-month onboard training period, then the period of onboard training should be extended until these criteria have been satisfactorily achieved.

### **Onboard training criteria**

19 The onboard training should at least provide knowledge and experience, relevant to the applicable tanker type, of the following:

#### **.1 Safety**

##### **.1.1 All tanker types**

- .1 Ship’s safety-management system
- .2 Cargo-specific fire-fighting equipment and procedures
- .3 Cargo-specific first-aid procedures, including the Medical First Aid Guide for Use in Accidents involving Dangerous Goods (MFAG)
- .4 Ship-/cargo-specific hazards, including smoking regulations, oxygen-depleted atmospheres, cargo hydrocarbon narcosis and toxicity
- .5 Risk assessment systems

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\* A nominated training vessel is a trading vessel named by the company that is suitable for the purpose of this guidance, as applicable.

- .6 Permit to work, including hot work and enclosed spaces entry procedures
- .7 Use of personal protective equipment
- .1.2 Additional for liquefied gas tankers
  - .1 Dangers and precautions related to handling and storage of cargoes at cryogenic temperatures
- .2 Construction, cargo, cargo tanks and pipelines**
  - .2.1 All tanker types
    - .1 Hull/tank construction and limitations
    - .2 Cargo connections
    - .3 Properties and hazards associated with the types of cargo being carried, including use of Material Safety Data Sheets
    - .4 The risks that cargo operations (such as purging/gas-freeing/tank cleaning) may have on the accommodation ventilation systems and actions to mitigate these risks
    - .5 Configuration of cargo and ballast system
    - .6 Pumps and associated equipment
    - .7 Specialist equipment associated with the cargo operations
    - .8 Particulars of the tanker's construction and how this affects the cargo operations
  - .2.2 Additional for liquefied gas tankers
    - .1 Use of segregation, separation and airlocks to maintain gas-safe areas
    - .2 Cargo tank, inter-barrier, insulation spaces, and pipeline relief valves and vapour venting systems
    - .3 Cargo vapour compressors and associated equipment
- .3 Trim and stability**
  - .3.1 All tanker types
    - .1 Tanker's stability information and calculating equipment
    - .2 Importance of maintaining stress levels within acceptable limits
    - .3 Dangers of free surface effect and "sloshing" effect
- .4 Cargo operations**
  - .4.1 All tanker types
    - .1 Pre-planning of loading/in-transit care, discharge/ballast operations
    - .2 Record keeping
    - .3 Start up/stopping procedures, including emergency shutdown
    - .4 Attention required for mooring arrangements during cargo operations
    - .5 Purging and inerting requirements and associated hazards
    - .6 Loading cargo, including topping-off operations

- .7 Discharging cargo, including draining and stripping operations
  - .8 Monitoring of cargo during loading/discharging operations, including sampling where applicable
  - .9 Tank gauging and alarm systems
  - .10 Dangers from electrostatic discharge and its prevention
  - .11 Ballasting and deballasting operations
  - .12 Maintenance requirements, including coating inspections
- .4.2 Additional for chemical tankers
- .1 Polymerization, cargo compatibility, tank coating compatibility and other reactions
  - .2 Functions of inhibitors and catalysts
  - .3 Vapour/gas dispersion
- .4.3 Additional for liquefied gas tankers
- .1 Polymerization, cargo compatibility, tank coating compatibility and other reactions
  - .2 Functions of inhibitors and catalysts
  - .3 Causes of backpressure and pressure surge effects
  - .4 Use of boil-off gas as a fuel
  - .5 Vapour/gas dispersion
  - .6 Purging and cool-down operations
  - .7 Operation and maintenance of re-liquefaction equipment
  - .8 Understanding and use of the custody transfer system
- .4.4 Additional for oil tankers
- .1 Crude oil washing systems
- .5 Tank washing/cleaning**
- .5.1 All tanker types
- .1 Tank cleaning systems and equipment fitted on the tanker
  - .2 Pre-planning of tank washing/cleaning operations
  - .3 Tank washing procedures, including purging and inerting
  - .4 Control of slops/waste product
  - .5 Electro-static hazards
  - .6 Cleanliness requirements
  - .7 Maintenance requirements
- .5.2 Additional for chemical tankers
- .1 Removal of inhibitors and residues
  - .2 Use of absorption, cleaning agents and detergents
- .5.3 Additional for liquefied gas tankers
- .1 Hot-gassing/boil-off of liquid residues and regassification process

**.6 Inert gas systems**

.6.1 All tanker types

- .1 Inerting system(s) and equipment fitted to the tanker
- .2 Hazards associated with inerting of spaces, with particular reference to safe entry into tanks
- .3 Purging, maintaining inert atmosphere and gas-freeing operations
- .4 Maintenance requirements

**.7 Pollution prevention and control**

.7.1 All tanker types

- .1 International, flag State and company regulations, documentation and plans
- .2 Operation of the tanker's pollution-prevention systems and equipment, including discharge monitoring
- .3 Operation of the tanker's pollution-containment equipment

**.8 Gas-detection equipment and instruments**

.8.1 All tanker types

- .1 Use and calibration of personal, portable and fixed gas analysers, with particular reference to oxygen and hydrocarbon monitoring equipment
- .2 Operation, maintenance and limitation of cargo tank level measuring, level alarm and temperature-measuring systems

.8.2 Additional for liquefied gas tankers

- .1 Operation and maintenance of hull temperature measurement

**.9 Publications**

.9.1 All tanker types

- .1 International, flag State and company publications relevant to the operation of the tanker, including SOLAS, MARPOL and applicable guidance manuals
- .2 Operating and maintenance manuals specific to the equipment on board
- .3 Established industrial standards and code of safe working practice (e.g., ICS, OCIMF, SIGTTO)

**Section B-V/1-1**

*Guidance regarding training and qualifications of masters, officers and ratings on oil and chemical tankers*

**OIL TANKER TRAINING**

20 The training required by paragraphs 2.2 and 4.3 of regulation V/1-1 in respect of oil tankers should be set out in a training plan which clearly expresses, for all parties involved, the objectives of the training. Training may be given on board or ashore, where appropriate. 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\*.

21 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**

22 The training required by paragraphs 2.2 and 6.3 of regulation V/1-1 in respect of chemical tankers should be set out in a training plan which clearly expresses, for all parties involved, the objectives of the training. Training may be given on board or ashore, where appropriate. 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\*.

23 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.

**Section B-V/1-2**

*Guidance regarding training and qualifications of masters, officers and ratings on liquefied gas tankers*

24 The training required by paragraphs 2.2 and 4.3 of regulation V/1-2 in respect of liquefied gas tankers should be set out in a training plan which clearly expresses, for all parties involved, the objectives of the training. Training may be given on board or ashore, where appropriate. 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\*.

25 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.

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.



## **Section B-V/2**

*Guidance regarding training of seafarers on passenger ships*

### **ENHANCED FIRE FIGHTING**

1 For officers and crew on passenger ships, additional training should be provided highlighting the difficulties of fighting fires, including access to confined spaces and prevention of the spread of fire to adjoining spaces.

### **DAMAGE CONTROL**

2 In developing standards of competency given in sections A-II/1, A-II/2 and A-III/2 to achieve the necessary level of theoretical knowledge, understanding and proficiency in damage control and watertight integrity, companies and training institutions should take into account the minimum knowledge, understanding and proficiency for damage control and watertight integrity as given below:

#### **Competence**

Minimize the risk of flooding and maintain a state of readiness to respond to emergency situations involving damage to the watertight integrity of the ship.

#### **Knowledge, understanding and proficiency**

Shipboard damage control plans and organization.

*Damage control systems, equipment (lockers) and emergency escape routes*

The key elements in maintaining stability and watertight integrity.

Importance of securing flooding and maintaining watertight boundaries.

*Actions to be taken aboard a ship in the event of an explosion, grounding, collision, or fire*

Damage control techniques consistent with equipment found on board including the ship bilge systems and pumps.

## **Section B-V/a\***

*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.

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\* Note there are no corresponding regulations in the Convention or sections in part A of the Code for sections B-V/a, B-V/b, B-V/c, B-V/d, B-V/e, B-V/f and B-V/g.

- 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 on 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
  - .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 International Codes of Safety for High-Speed Craft (1994 HSC Code and 2000 HSC Code), as appropriate.

#### **Section B-V/b\*\***

*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 14 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 to 9 and the hazards associated with each class; and materials hazardous only in bulk (MHB) outlined in the International Maritime Solid Bulk Cargoes (IMSBC) Code.

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

\*\* Note there are no corresponding regulations in the Convention or sections in part A of the Code for sections B-V/a, B-V/b, B-V/c, B-V/d, B-V/e, B-V/f and B-V/g.

## **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.

6 General use of and familiarization with the International Maritime Solid Bulk Cargoes (IMSBC) 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 – Radioactive material**

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 – Corrosive substances**

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 (IMSBC Code); 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 Response 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 International Maritime Solid Bulk Cargoes (IMSBC) Code, as appropriate, 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/c\***

*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 to 9 and the hazards associated with each class.

**Health hazards**

4 Dangers from skin contact, inhalation, ingestion and radiation.

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\* Note there are no corresponding regulations in the Convention or sections in part A of the Code for sections B-V/a, B-V/b, B-V/c, B-V/d, B-V/e, B-V/f and B-V/g.

## **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 MARPOL 73/78, 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 and 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 six 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, or dissolved under pressure), flammable, non-flammable, non-toxic and toxic**

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 – Radioactive material**

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 – Corrosive substances**

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 Response 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.

**Section B-V/d\***

*Guidance on application of the provisions of the STCW Convention to mobile offshore units (MOUs)*

1 The provisions of the STCW Convention apply to the maritime personnel of self-propelled MOUs proceeding on voyages.

2 The provisions of the STCW Convention do not apply to non-self-propelled MOUs or to MOUs on station.

3 When considering appropriate standards of training and certification when an MOU is on station, the country of registry should take account of relevant IMO recommendations. In particular, all maritime crew members on self-propelled MOUs and, where required, on other units should meet the requirements of the STCW Convention, as amended.

4 Self-propelled MOUs proceeding on international voyages are required to carry safe manning documents.

5 MOUs on station are subject to the national legislation of the coastal State in whose Exclusive Economic Zone (EEZ) they are operating. Such coastal States should also take account of relevant IMO recommendations and should not prescribe higher standards for MOUs registered in other countries than the standards applied to MOUs registered in that coastal State.

6 All special personnel employed on board MOUs (whether or not self-propelled) should be provided with appropriate familiarization and basic training in accordance with relevant IMO recommendations.

**Section B-V/e\***

*Guidance regarding training and qualifications of masters and officers in charge of a navigational watch on board offshore supply vessels*

1 It is important that masters and officers involved in offshore supply operations should have relevant experience or training before assuming their duties on offshore supply vessels. The focus should be on onboard operational experience or a combination of operational experience and simulator training.

2 Masters and officers should understand the unique manoeuvring and handling characteristics common to offshore supply vessels.

3 Prior to performing offshore supply operations, the master and officers should:

- .1 have knowledge of the offshore industry and the terms used in the various operations;
- .2 understand the importance of maintaining a safe working distance at all times when working in an offshore location/installation;
- .3 have knowledge of vessel manoeuvring and station-keeping under various weather conditions;

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\* Note there are no corresponding regulations in the Convention or sections in part A of the Code for sections B-V/a, B-V/b, B-V/c, B-V/d, B-V/e, B-V/f and B-V/g.

- .4 understand the specific design parameters of the vessels; and
  - .5 understand the need to have unrestricted oversight and views of work areas.
- 4 While on board an offshore supply vessel, the master and officers should:
- .1 have knowledge of the handling characteristics and behaviour of vessels fitted with various propulsion arrangements; and
  - .2 be capable of operating the offshore supply vessel in close proximity to an offshore installation and other vessels.
- 5 Masters should understand the need for other personnel on board who are involved in performing offshore supply operations to be familiarized with their duties.

*Offshore supply vessels performing anchor-handling operations*

6 It is important that masters and officers in charge of a navigational watch on board offshore supply vessels involved in anchor-handling operations have relevant experience and training.

7 Prior to performing anchor-handling operations, masters and officers in charge of a navigational watch should:

- .1 be well informed of the ship's handling characteristics in relation to anchor-handling, including, but not limited to:
  - .1.1 navigation and position-holding;
  - .1.2 ship-handling;
  - .1.3 thorough knowledge of the stability of offshore supply vessels, in particular the combination of low  $GZ_{max}$ , low open deck and large external forces. Use of loading calculators and the conflict between a rigid and stiff ship and good work environment on deck. Potential reduction of stability from use of anti-rolling devices; and
  - .1.4 operations in hazardous oil-field areas, including locating any pipelines or other structures on the seabed in the area where anchors or other mooring equipment is likely to be used; and
- .2 be made thoroughly familiar with the use of all instruments and systems fitted in the ship concerned and involved in anchor-handling, including their capabilities and limitations, including, but not limited to:
  - .2.1 use of various thrusters, conventional or azimuth propulsion;
  - .2.2 pickup, handling, heavy lifting, towing out, anchor-handling and laying of anchors for offshore rigs, barges and installations;
  - .2.3 towing of rigs, barges and other vessels;



- .2.4 operation of lifting and towing winches with up to 600 metric tons bollard pull;
- .2.5 detailed thorough knowledge of the basis of operation of towing- and anchor-handling winches; in particular, functions of load-limiting devices and release systems and associated equipment as towing pins and stoppers; and
- .2.6 the significant difference between emergency release of towing hooks and winches.

8 Masters and officers in charge of a navigational watch when in charge of anchor-handling should have sufficient and appropriate training and experience by having been supervised during a number of Rig-moves, as deemed appropriate by the Administration. Training may be supplemented by appropriate simulator training.

### **Section B-V/f\***

#### *Guidance on the training and experience for personnel operating dynamic positioning systems*

1 Dynamic positioning is defined as the system whereby a self-propelled vessel's position and heading is automatically controlled by using its own propulsion units.

2 Personnel engaged in operating a Dynamic Positioning (DP) system should receive relevant training and practical experience. Theoretical elements of this training should enable Dynamic Positioning Operators (DPOs) to understand the operation of the DP system and its components. Knowledge, understanding and experience gained should enable personnel to operate vessels safely in DP, with due regard for safety of life at sea and protection of the marine environment.

3 The content of training and experience should include coverage of the following components of a DP system:

- .1 DP control station;
- .2 power generation and management;
- .3 propulsion units;
- .4 position reference systems;
- .5 heading reference systems;
- .6 environmental reference systems; and
- .7 external force reference systems, such as hawser tension gauges.

4 Training and experience should cover the range of routine DP operations, as well as the handling of DP faults, failures, incidents and emergencies, to ensure that operations are continued or terminated safely. Training should not be limited to DPOs and DP masters only;

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\* Note there are no corresponding regulations in the Convention or sections in part A of the Code for sections B-V/a, B-V/b, B-V/c, B-V/d, B-V/e, B-V/f and B-V/g.

other personnel on board, such as electro-technical and engineer officers, may require additional training and experience to ensure that they are able to carry out their duties on a DP vessel. Consideration should be given to conducting appropriate DP drills as a part of onboard training and experience. DPOs should be knowledgeable of the type and purpose of documentation associated with DP operations, such as operational manuals, Failure Modes and Effects Analysis (FMEAs) and capability plots.

5 All training should be given by properly qualified and suitably experienced personnel.

6 Upon appointment to a vessel operating in DP mode, the master, DPOs and other DP-trained personnel should be familiarized with the specific equipment fitted on and the characteristics of the vessel. Particular consideration should be given to the nature of the work of the vessel and the importance of the DP system to this work.

### **Section B-V/g\***

*Guidance regarding training of masters and officers for ships operating in polar waters\*\**

1 It is important that masters, officers in charge of a navigational watch and officers in charge of an engineering watch on board ships operating in polar waters should have relevant experience and training, as follows:

- .1 Prior to being assigned duties on board such ships:
  - .1.1 For masters and officers in charge of a navigational watch, the training should provide basic knowledge on at least the subjects given in paragraphs 2 to 11 hereunder; and
  - .1.2 For officers in charge of an engineering watch, the training should provide basic knowledge on at least the subjects given in paragraphs 3, 6, 10 and 11 hereunder.
- .2 Masters and Chief Engineer Officers should have sufficient and appropriate experience in operating ships in polar waters.

### **Ice characteristics – ice areas**

2 Interpretation of different ice-charts and awareness of limitations in meteorology and oceanography data, ice physics, formation, growth, ageing and stage of melt; ice types and concentrations; ice pressure; friction from snow-covered ice; implications of spray-icing and icing up; precautions against icing up and mitigation of consequences; ice regimes in different regions and different seasons, including the differences between the Arctic and the Antarctic; recognition of consequences of rapid change in ice and weather conditions; movement of icebergs and pack ice.

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\* Note there are no corresponding regulations in the Convention or sections in part A of the Code for sections B-V/a, B-V/b, B-V/c, B-V/d, B-V/e, B-V/f and B-V/g.

\*\* Refer to IMO Assembly resolution A.1024(26) on Guidelines for ships operating in polar waters.

### **Ship's performance in ice and cold climate**

3 Vessel characteristics; vessel types, hull designs; ice-strengthening requirements; ice-class of different classification societies – polar class and local regulations; limitations of ice-classes; winterization and preparedness of vessel; low-temperature system performance.

### **Voyage and passage planning for a ship in ice\***

4 Development of safe routing and passage planning to avoid ice where possible, including interpreting various forms of ice imagery and data to assist in the preparation of a strategic passage planning; entering ice from open water to avoid icebergs and dangerous ice conditions; navigation, determining when it is safe or not safe to enter areas containing ice or icebergs due to darkness, swell, fog or pressure ice.

### **Operating and handling a ship in ice**

5 Preparations and risk assessment before approaching ice-infested waters; unassisted operation of vessels with different ice-class in different ice-types; safe speed in the presence of ice and icebergs; communications with an icebreaker and other vessels; navigation in various ice concentrations and coverage; awareness of the increase in energy of movement; use of icebergs for shelter and access through packed ice.

6 Use of different type of propulsion system and rudder, including awareness of system strength and capacity limitations; use of heeling and trim systems, engine loads and cooling problems.

### **Regulations and recommendations**

7 Local requirements for entering different regions, including the Antarctic Treaty; international regulations and recommendations.

### **Equipment limitations**

8 Use of and hazards associated with terrestrial navigational aids in polar waters; high-latitude compass errors; discrimination of radar targets and ice-features in ice-clutter; limitations of electronic positioning systems at high latitude; limitations in nautical charts and pilot descriptions; limitations in communication systems.

### **Safety precautions and emergency procedures**

9 Availability of hydrographic data sufficient for safe navigation; precautions when navigating in poorly charted waters; limitations of search and rescue readiness and responsibility, including GMDSS area A4 and its SAR communication facility limitation; awareness of contingency planning; knowledge of towing procedures; value of contact with other ships and local SAR organization; recognizing dangers when crews are exposed to low temperatures; procedures and techniques for abandoning the ship and survival on the ice; crew-fatigue problems due to noise and vibrations; carriage of additional resources such as bunkers, food and extra clothing; awareness of the additional severity of consequences of incidents in polar waters.

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\* Refer to IMO Assembly resolution A.999(25) on Guidelines on voyage planning for passenger ships operating in remote areas.

10 Establishing safe working procedures; awareness of the most common hull and equipment damages and how to avoid them; fire-fighting systems limitations.

**Environmental considerations**

11 Sensitive sea areas regarding discharge; areas where shipping is prohibited or should be avoided; Special Areas in MARPOL; oil-spill equipment limitations; plan for coping with increased volumes of garbage, bilge water, sludge, sewage, etc.; consequences of pollution in a cold climate.

## CHAPTER VI

### Guidance regarding emergency, occupational safety, security, medical care and survival functions

#### Section B-VI/1

*Guidance regarding mandatory requirements for safety familiarization and basic training and instruction for all seafarers*

#### FIRE PREVENTION AND FIRE FIGHTING

1 The 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:
  - .10.1 fixed installations on board and their locations; fire mains, hydrants; international shore connection; smothering installations, carbon dioxide (CO<sub>2</sub>), foam; pressure water spray system in special category spaces, etc.;

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

- 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 lifeline 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; high-, medium- and low-expansion foam; carbon dioxide (CO<sub>2</sub>); 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 lifeline 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; and
- .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 from ship-to-shore, the increasing use of multinational 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 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.

## **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.

3 Parties may also accept onboard training and experience (such as participation in drills) for maintaining the required standard of competence of table A-VI/2-1, in the areas outlined in

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

section A-VI/2, paragraphs 6.1.2, 6.1.3, 6.1.4, 6.2.1, and 12.1.5. Administrations should bear in mind that onboard training in these areas can only be carried out under good weather conditions and port regulations permitting.

### **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*

Training programmes for seafarers designated to undertake the tasks, duties and responsibilities listed in column 1 of table A-VI/4-1 to provide medical first aid on board ship should take into account guidance in the revised International Medical Guide for Ships, as appropriate.

### **Section B-VI/5**

*Guidance regarding training and certification for ship security officers*

1 The training should be relevant to the provisions of the ISPS Code and the SOLAS Convention, as amended\*.

2 On completion of training, a ship security officer should have adequate knowledge of the English language to correctly interpret and communicate messages relevant to ship or port facility security.

3 In circumstances of exceptional necessity, when a person holding a certificate of proficiency as a ship security officer is temporarily unavailable, the Administration may permit a seafarer having specific security duties and responsibilities and an understanding of the ship security plan to serve as ship security officer and to execute all duties and responsibilities of the ship security officer until the next port of call or for a period not exceeding 30 days, whichever is greater. The company should, as soon as possible, inform the competent authorities of the next port(s) of call of the arrangements in place.

### **Section B-VI/6**

*Guidance regarding mandatory minimum requirements for security-related training and instruction for all seafarers*

#### **Familiarization and security-awareness**

1 Seafarers and shipboard personnel are not security experts and it is not the aim of the provisions of the Convention or this Code to convert them into security specialists.

2 Seafarers and shipboard personnel should receive adequate security-related training or instruction and familiarization training so as to acquire the required knowledge and understanding to perform their assigned duties and to collectively contribute to the enhancement of maritime security.

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\* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.



3 Seafarers without designated security duties should complete the security awareness training or instruction set out in section A-VI/6 at least one time in their career. There is no need for refreshment or revalidation of this training if the seafarer or the shipboard personnel concerned meet the security-related familiarization requirements of regulation VI/6 and participate in the drills and exercises required by the ISPS Code.

#### **Seafarers with designated security duties**

4 The expression “with designated security duties” in section A-VI/6 denotes those having specific security duties and responsibilities in accordance with the ship security plan.

5 Seafarers with designated security duties should complete the training as set out in section A-VI/6 at least one time in their career. There is no need for refreshment or revalidation of this training if the seafarer or the shipboard personnel concerned meet the security-related familiarization requirements of regulation VI/6 and participate in the drills and exercises required by the ISPS Code.

6 Those providing “security-related familiarization training” in accordance with section A-VI/6 should not be required to meet the requirements of either regulation I/6 or of section A-I/6.

7 In circumstances of exceptional necessity, when the shipboard security-related duties are required to be undertaken by a person qualified to perform designated security-related duties and such a person is temporarily unavailable, the Administration may permit a seafarer without designated security duties to perform such duties provided such a person has an understanding of the ship security plan, until the next port of call or for a period not exceeding 30 days, whichever is greater.

**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 special integrated deck and engine training programmes*

- 1 Each Party should ensure that any special integrated deck and engine training programme:
  - .1 is provided by means of an approved training programme;
  - .2 takes place ashore within maritime training institutions and/or on board approved training ships; and
  - .3 is documented in an approved training record book.

**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, security 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;
- .2 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; and
- .3 the provisions may be varied for ships on short sea voyages, provided special safety arrangements are put in place.

4 Exceptions provided for in section A-VIII/1, paragraph 9, should be construed to mean the exceptions laid down by the ILO Convention on Seafarers’ Hours of Work and the Manning of Ships, 1996 (No.180) or the Maritime Labour Convention, 2006, when it enters into force. The circumstances under which such exceptions are applied should be defined by the Parties.

5 Based on information received as a result of investigating maritime casualties, Administrations should keep their provisions on prevention of fatigue under review.

#### Prevention of drug and alcohol abuse

6 Drug and alcohol abuse directly affect the fitness and ability of a seafarer to perform watchkeeping duties or duties that involve designated safety, prevention of pollution and security duties. Seafarers found to be under the influence of drugs or alcohol should not be permitted to perform watchkeeping duties or duties that involve designated safety, prevention of pollution and security duties, until they are no longer impaired in their ability to perform those duties.

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\* See the annex to IMO Assembly resolution A.772(18) on Fatigue factor in manning and safety, paragraphs 2 to 4.4.1 and MSC/Circ.1014. on Guidance on fatigue mitigation and management.

7 Administrations should ensure that adequate measures are taken to prevent alcohol and drugs from impairing the ability of watchkeeping personnel and those whose duties involve designated safety, prevention of pollution and security duties, 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.

8 Companies should consider the implementation of a clearly written policy of drug and alcohol abuse prevention, including prohibition to consume alcohol within four hours prior to serving as a member of a watch either by inclusion in the company's quality-management system or by means of providing adequate information and education to the seafarers.

9 Those involved in establishing drug and alcohol abuse prevention programmes should take into account the guidance contained in the ILO publication *Drug and Alcohol Prevention Programmes in the Maritime Industry (A Manual for Planners)*<sup>\*</sup>, as may be amended.

## **Section B-VIII/2**

### *Guidance regarding watchkeeping arrangements and principles to be observed*

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 – WATCHKEEPING PRINCIPLES IN GENERAL**

(No provisions)

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Annex III of this manual includes “Guiding Principles on Drug and Alcohol Testing procedures for Worldwide Application in the Maritime Industry”. These guiding principles were adopted by the Joint ILO/WHO Committee on the Health of Seafarers (May 1993).

## **PART 4 – GUIDANCE ON WATCHKEEPING AT SEA**

### ***Part 4-1 – 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, security and property at sea and of preventing pollution of the marine environment.

#### **Anchor watch**

4 The master of every ship at an unsheltered anchorage, at an open roadstead or any other virtually “at sea” conditions in accordance with chapter VIII, section A-VIII/2, part 4-1, paragraph 51 of the STCW Code, should ensure that watchkeeping arrangements are adequate for maintaining a safe watch at all times. A deck officer should at all times maintain responsibility for a safe anchor watch.

5 In determining the watchkeeping arrangements, and commensurate with maintaining the ship’s safety and security and the protection of the marine environment, the master should take into account all pertinent circumstances and conditions such as:

- .1 maintaining a continuous state of vigilance by sight and hearing as well as by all other available means;
- .2 ship-to-ship and ship-to-shore communication requirements;
- .3 the prevailing weather, sea, ice and current conditions;
- .4 the need to continuously monitor the ship’s position;
- .5 the nature, size and characteristics of anchorage;
- .6 traffic conditions;
- .7 situations which might affect the security of the ship;
- .8 loading and discharging operations;
- .9 the designation of stand-by crew members; and
- .10 the procedure to alert the master and maintain engine readiness.

***Part 4-2 – 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 4-3 – 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 1.5. This should be recorded in the deck or radio log-book.

**Watchkeeping**

11 In addition to the requirements concerning radio watchkeeping, 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, 1974 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 Protocol additional to the Geneva Conventions of 12 August 1949, and relating to the protection of victims of international armed conflicts (Protocol I), 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 5 – GUIDANCE ON WATCHKEEPING IN PORT**

(No provisions)”

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