



MARINE DEPARTMENT  
GOVERNMENT OF THE HONG KONG  
SPECIAL ADMINISTRATIVE REGION

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**Certificates of Proficiency or Endorsements for  
Oil, Chemical and Liquefied Gas Tanker  
Cargo Operations  
Determinations**

**(2022 Edition)**

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Made under Section 7(3) of the  
Merchant Shipping (Seafarers) (Tankers) Regulation (Cap.478AG)

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**(Rev.2/2022)**

MERCHANT SHIPPING (SEAFARERS) ORDINANCE  
(CHAPTER 478)

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**Marine Department  
The Hong Kong Special Administrative Region**

First Edition 2016  
Second Edition 2022

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## SECTION 1

### COMMENCEMENT, INTERPRETATION & GENERAL REQUIREMENTS

#### **1.1 Commencement**

- 1.1.1 The Certificates of Proficiency or Endorsements for Oil, Chemical and Liquefied Gas Tanker Cargo Operations Determinations (the Determinations) are made by the Seafarers' Authority (hereafter referred to as “the Authority”) under powers granted by the Merchant Shipping (Seafarers) (Tanker) Regulation (Cap.478AG) and are the second edition that shall be effected on 28 February 2022.

#### **1.2 Interpretation**

- 1.2.1 In the Determinations, unless the context otherwise requires:

“**approved**” means approved or recognized by the Director of Marine;

“**Authority**” means the Seafarers’ Authority established by section 4(1) of the Merchant Shipping (Seafarers) Ordinance, Cap.478. For the purpose of the Determinations, Director of Marine is the Authority;

“**chemical tanker**” means a ship constructed or adopted and used for carriage in bulk of any liquid chemical;

“**Convention**” means the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as from time to time revised or amended by any revision or amendment to any provision of such Convention that applies to Hong Kong;

“**Director**” means the Director of Marine;

“**endorsement**”, in relation to a certificate of competency or of service or a licence, means an endorsement in respect of a trading area, type of ship or dangerous cargo;

“**IGC Code**” means the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk published by the International Maritime Organization, as from time to time revised or amended by the International Maritime Organization;

“**liquefied gas tanker**” means a ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other product listed in Chapter 19 of the IGC Code;

“**oil tanker**” means a ship constructed and used for the carriage of petroleum and petroleum products in bulk;

“**STCW Code**” means the Seafarers’ Training, Certification and Watchkeeping Code published by the International Maritime Organization, as from time to time revised or amended by any revision or amendment to any provision of such Code that applies to Hong Kong.

### **1.3 General Requirements**

- 1.3.1 The subsequent sections of the Determinations set out the training and qualification requirements for oil, chemical and liquefied gas tanker cargo operations and the conditions to be satisfied by any person to qualify for a certificate of proficiency or an endorsement, the manner in which the attainment of such standards or the satisfaction of such conditions is to be established, the procedure for the application and issue of a certificate of proficiency or an endorsement.
- 1.3.2 Any person who feels aggrieved by any decision of the Authority to refuse to issue a certificate of proficiency or an endorsement, may appeal against the decision to the Administrative Appeals Board within thirty (30) days of being informed of such decision.
- 1.3.3 The Director may, at his discretion, permit exemption from any or all of the provisions of the Determinations.

### **1.4 Transitional Provisions**

- 1.4.1 During the transitional period, a contravention of section 4 does not constitute an offence under section 14 of the Merchant Shipping (Seafarers) (Tankers) Regulation (Cap.478AG).
- 1.4.2 In this section –  
**transitional period** means the period beginning on 1 December 2016 and ending on 31 December 2016.

## SECTION 2

### CERTIFICATES OF PROFICIENCY OR ENDORSEMENTS

#### GENERAL PROVISIONS

#### **2.1 Certificates of Proficiency or Endorsements for Oil, Chemical and Liquefied Gas Tanker Cargo Operations**

2.1.1 Certificate of Proficiency or Endorsement means any of the following certificates or endorsements issued under the Merchant Shipping (Seafarers) (Tankers) Regulation (Cap.478AG) –

- (a) Certificate of Proficiency or Endorsement in Basic Training for Oil and Chemical Tanker Cargo Operations;
- (b) Certificate of Proficiency or Endorsement in Advanced Training for Oil Tanker Cargo Operations;
- (c) Certificate of Proficiency or Endorsement in Advanced Training for Chemical Tanker Cargo Operations;
- (d) Certificate of Proficiency or Endorsement in Basic Training for Liquefied Gas Tanker Cargo Operations; and
- (e) Certificate of Proficiency or Endorsement in Advanced Training for Liquefied Gas Tanker Cargo Operations.

#### **2.2 Application**

2.2.1 The applicant for a Certificate of Proficiency or an Endorsement for Oil, Chemical and Liquefied Gas Tanker Cargo Operations must complete an application form which may be obtained from the Marine Department, Seagoing Examination and Mercantile Marine Office, or by post from:

Marine Department  
Seagoing Examination and Mercantile Marine Office  
3/F Harbour Building  
38 Pier Road  
Central  
Hong Kong

The application form could also be downloaded from the Marine Department's website (<https://www.mardep.gov.hk/en/forms/home.html#seagoing>).

2.2.2 Applicants should return the completed application form to the Seagoing Examination and Mercantile Marine Office together with the documents as stated in the application form.

2.2.3 The application must be accompanied by any evidence as may be necessary to establish that the requirements for the issue of the certificate or endorsement being applied for, or the conditions for renewal of the endorsement, have been satisfied.

- 2.2.4 It is important that the correct procedure for application is followed as discharges may have to be forwarded for verification which can take time, and in the absence of such verification the application cannot be processed.

## **2.3 Enquiries**

- 2.3.1 Applicants may make enquiries about their application and when doing so, should ensure that the point on which information is sought is clearly stated. Enquiries should be addressed to:

Seagoing Examination and Mercantile Marine Office  
Marine Department  
3/F Harbour Building  
38 Pier Road  
Central  
Hong Kong

Tel. No. : (852) 2852 4383  
Fax No. : (852) 2541 6754  
E-mail : [sssem@mardep.gov.hk](mailto:sssem@mardep.gov.hk)

## **2.4 Particulars of Sea Service**

- 2.4.1 An applicant's eligibility for a certificate of proficiency or an endorsement will depend, amongst other factors, on the amount of sea service performed and upon the seagoing ranks in which the applicant has served. It is, therefore, imperative that the particulars which applicants enter on the application form are accurately stated.

- 2.4.2 The amount of sea service set down in the Determinations for the Certificate of Proficiency for or Endorsement for Oil, Chemical and Liquefied Gas Tanker Cargo Operations is the **absolute minimum** that can be accepted. Unless applicants can prove the full amount they will not be issued with a certificate or an endorsement.

## **2.5 Use of Information**

- 2.5.1 Information required by the application form will be used by Marine Department for the process of application for and issue of certificate or endorsement. This information may be divulged to other departments and agencies authorised to process the information for the mentioned purposes. Limited personal data of successful applicant may be used via the Marine Department's website for verification of the issued certificate of proficiency or endorsement by any third parties.

- 2.5.2 Supply of information is obligatory. An applicant should ensure that all the information filled in the application form is accurate. Failure to do so may, besides subject to paragraph 2.6, result in an unsuccessful application.

- 2.5.3 For making correction and access to personal data after submission of application form, an applicant may contact the following officer:

Officer-in-charge



Marine Department  
Seagoing Examination and Mercantile Marine Office  
3/F Harbour Building  
38 Pier Road  
Central  
Hong Kong

## **2.6 Fraud or Misrepresentation**

2.6.1 Applicants are reminded that the Merchant Shipping (Seafarers) (Tankers) Regulation (Cap.478AG) provides that any person who, in connection with an application for the issue of a certificate of proficiency or an endorsement:

- (a) makes a false pretence; or
- (b) supplies false information,

knowing it to be false, or not believing it to be true, commits an offence and is liable, amongst other things, to a fine and to imprisonment.

## **2.7 Attempted Bribery**

2.7.1 Any applicant who offers an advantage to any officer of the Marine Department shall be guilty of an offence under the Prevention of Bribery Ordinance and shall be liable on summary conviction to a fine and to imprisonment. Such an applicant will not be issued with a certificate of proficiency for such a period as may be decided by the Director.

## **2.8 Quality Standards**

2.8.1 The education and training courses which an applicant attended to satisfy the training requirements for the issue of a certificate of proficiency or an endorsement shall generally follow a quality standards system or an alternative system acceptable to the Director. A list of the approved training courses can be found at the Marine Department's website ([https://www.mardep.gov.hk/filemanager/en/share/pub-services/pdf/crt\\_course.pdf](https://www.mardep.gov.hk/filemanager/en/share/pub-services/pdf/crt_course.pdf)).

## **2.9 Issue of Certificates or Endorsements**

2.9.1 Applicants who are successful in meeting all the requirements for the issue of a certificate of proficiency or an endorsement being applied for, will be issued with a certificate of proficiency or an endorsement. When the certificate or endorsement is ready, it will be forwarded by post to the applicant's address as given on the application form, unless the applicant wishes to make other arrangements.

2.9.2 To avoid unnecessary delays in the issue of certificate or endorsements, it is important that applicants should inform the Marine Department promptly of any change to the address given on the application form.

## **2.10 Fees**

- 2.10.1 Applicants for the certificate of proficiency or endorsement will be required to pay the prescribe fee (presently the fee is NIL) before any steps are taken to verify their eligibility for the issue of the certificate or endorsement.

## **2.11 Issue of Replacement Certificate**

- 2.11.1 If a Certificate of Proficiency for Oil, Chemical and Liquefied Gas Tanker Cargo Operations is lost, destroyed, damaged or defaced, the holder may apply to the Seagoing Examination and Mercantile Marine Office for a replacement certificate. A fee will be charged (presently the fee is HK\$ 155) for the replacement certificate unless the holder can show that the certificate was lost as a result of shipwreck or fire on board ship. An applicant for a replacement certificate will be required to make a declaration to the Officer-in-charge of the Seagoing Examination and Mercantile Marine Office regarding the circumstances in which the certificate was lost. Upon the issue of a copy certificate, the certificate that was lost, destroyed, damaged or defaced ceases to be valid.

## SECTION 3

### SEA SERVICE

#### **3.1 General**

- 3.1.1 This section specifies provisions relating to qualifying sea service.
- 3.1.2 Except where otherwise specified, the qualifying sea service required for a Certificate of Proficiency or Endorsement for Oil, Chemical and Liquefies Gas Tanker Cargo Operations is the service performed in ships which proceed to sea and which are actively engaged in commercial trading.
- 3.1.3 Qualifying sea service means time spent on board ship reckoned from the date of engagement to the date of discharge. Subject to verification, as and when necessary, certificates of discharge will be accepted as proof of sea service.
- 3.1.4 Proof of sea service for applicants serving on Hong Kong registered ships can be verified by the Mercantile Marine Office of Marine Department. Sea service on other ships must be confirmed by the Master(s) of the ship(s) concerned, or by the Consul or other recognized authority of the flag State. However, such confirmation will not necessarily be deemed sufficient (sample of report of shipboard service is shown in the Appendix II).
- 3.1.5 Calculations of voyage length for the purpose of establishing sea service should be made in calendar months and days. When it happens that an applicant has signed off and signed on again on the same day, that day may only be counted once. To calculate total sea service, the length of each voyage should be added together in months and days. The total of days should then be divided by 30 to give months, and residual days. The months should then be added as the total months.

## SECTION 4

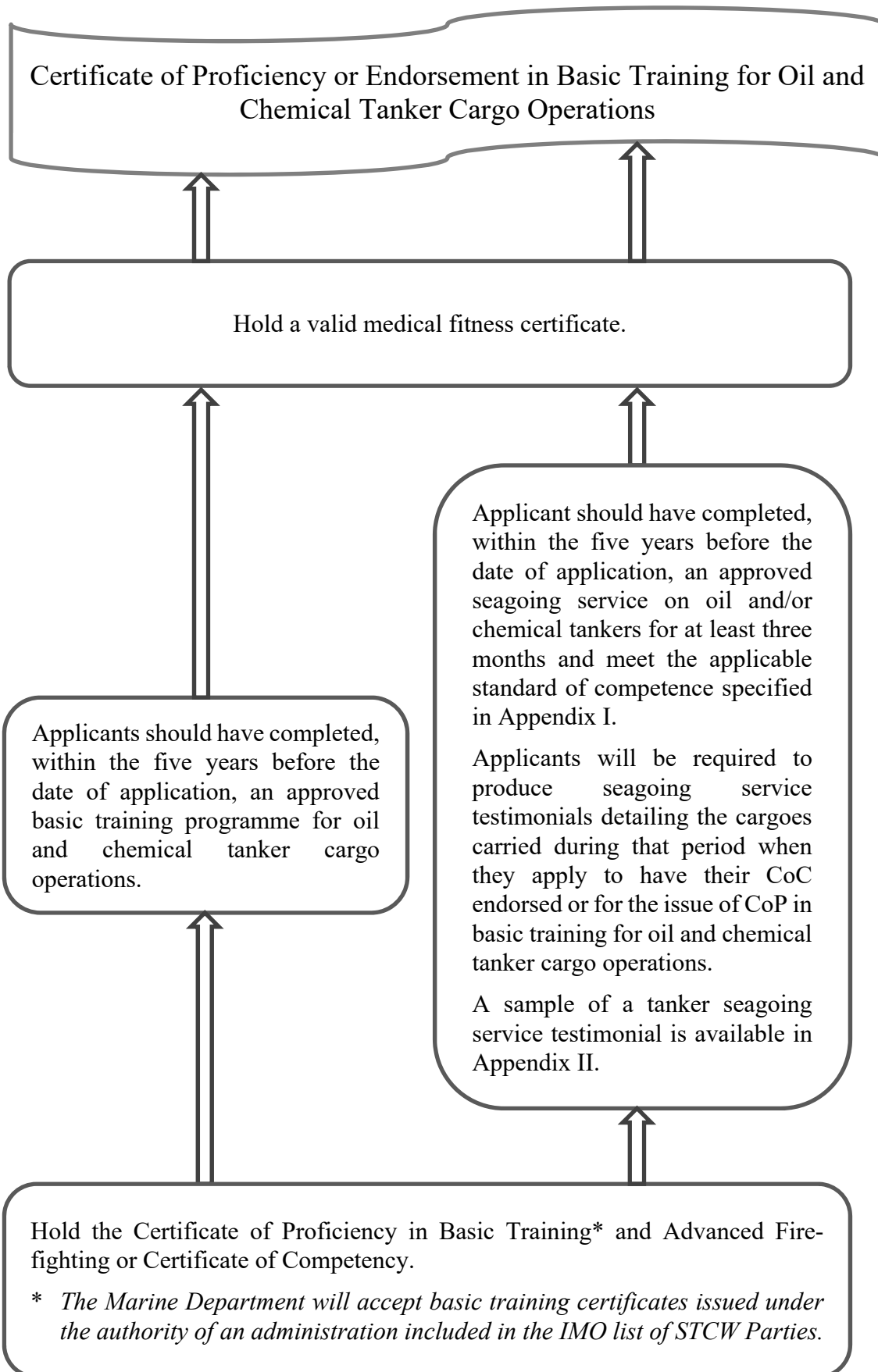
### QUALIFYING REQUIREMENTS

#### **4.1 Certification Requirements for Tankers**

- 4.1.1 There are two levels of training for tanker cargo operation: 'basic' and 'advanced'. The basic level is divided into two training programmes; 'Oil and Chemical', and 'Liquefied Gas'. The advanced level is divided into 3 separate training programmes; Oil, Chemical and Liquefied Gas.
- 4.1.2 Seafarer other than officers assigned specific duties or responsibilities related to cargo or cargo equipment on tankers, he/she is required to have a Certificate of Proficiency in Basic Training for appropriate type of tanker before taking up such duties. If he/she with immediate responsibility for loading, discharging, care in transit, handling of cargo, tank cleaning or other cargo-related operation on tankers must hold a Certificate of Proficiency in Advanced Training for appropriate type of tanker.
- 4.1.3 Officer assigned specific duties or responsibilities related to cargo or cargo equipment on tankers, he/she is required to hold Certificate of Competency or Licence that carry Basic Training Endorsement appropriate to the type of tanker he/she is working on. Master, chief engineer officers, chief mates, second engineer officers and any officer with immediate responsibility for loading, discharging, care in transit, handling of cargo, tank cleaning or other cargo-related operation on tankers are required to hold Certificate of Competency or Licence that carry Advanced Training Endorsement appropriate to the type of tanker he/she is working on.
- 4.1.4 All applicants of Certificate of Proficiency or Endorsement for Oil, Chemical and Liquefies Gas Tanker Cargo Operations shall hold a Certificate of Proficiency in Advanced Fire Fighting in accordance with provisions of section A-VI/3 of the STCW Code.
- 4.1.5 All of the requirements for a tanker endorsement must be met within the fiver (5) year period immediately prior to the application.

#### **4.2 Certificate of Proficiency or Endorsement in Basic Training for Oil and Chemical Tanker Cargo Operations**

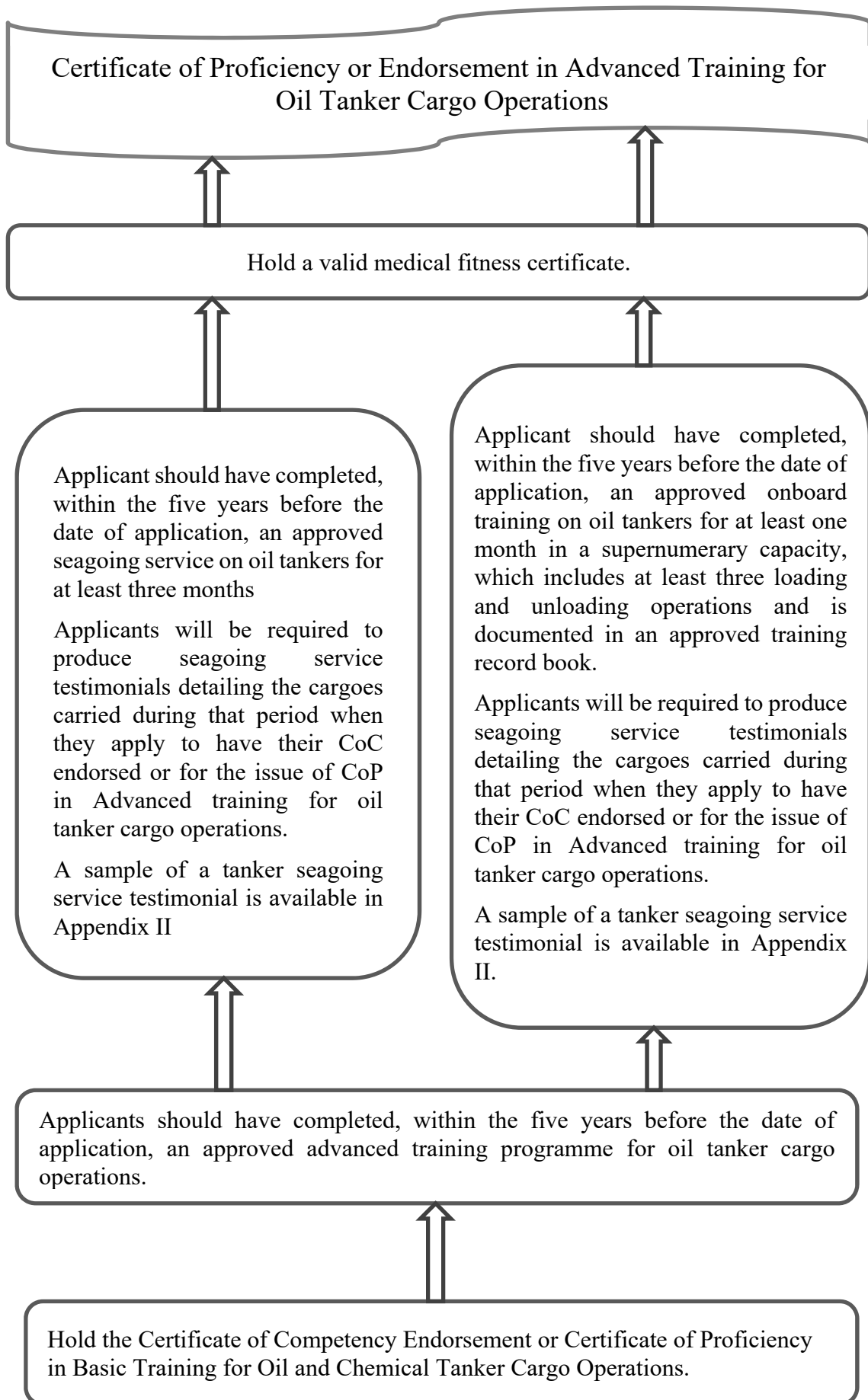
- 4.2.1 To qualify for the issue of a Certificate of Proficiency or Endorsement in Basic Training for Oil and Chemical Tanker Cargo Operations in Hong Kong, an applicant must have completed basic training in accordance with provisions of section A-VI/1 of the STCW Code and must have completed:
- (a) at least three months of approved seagoing service on oil or chemical tankers and have met the standard of competence specified in section A-V/1-1, paragraph 1 of the STCW Code (standard of competence is shown in the Appendix I), or
  - (b) an approved basic training for oil and chemical tanker cargo operations and have met the standard of competence specified in section A-V/1-1, paragraph 1 of the STCW Code (standard of competence is shown in the Appendix I).



### **4.3 Certificate of Proficiency or Endorsement in Advanced Training for Oil Tanker Cargo Operations**

4.3.1 To qualify for the issue of a Certificate of Proficiency or Endorsement in Advanced Training for Oil Tanker Cargo Operations in Hong Kong, an applicant must:

- (a) have met the requirements for certification in basic training for oil and chemical tanker cargo operations; and
- (b) while qualified for certification in basic training for oil and chemical tanker cargo operations, have:
  - (i) at least three months of approved seagoing service on oil tankers, or
  - (ii) at least one month of approved onboard training on oil tankers, in a supernumerary capacity, which includes at least three loading and three unloading operations and is documented in an approved training record book taking into account guidance in section B-V/1; and
- (c) have completed approved advanced training for oil tanker cargo operations and have met the standard of competence specified in section A-V/1-1, paragraph 2 of the STCW Code (standard of competence is shown in the Appendix I).

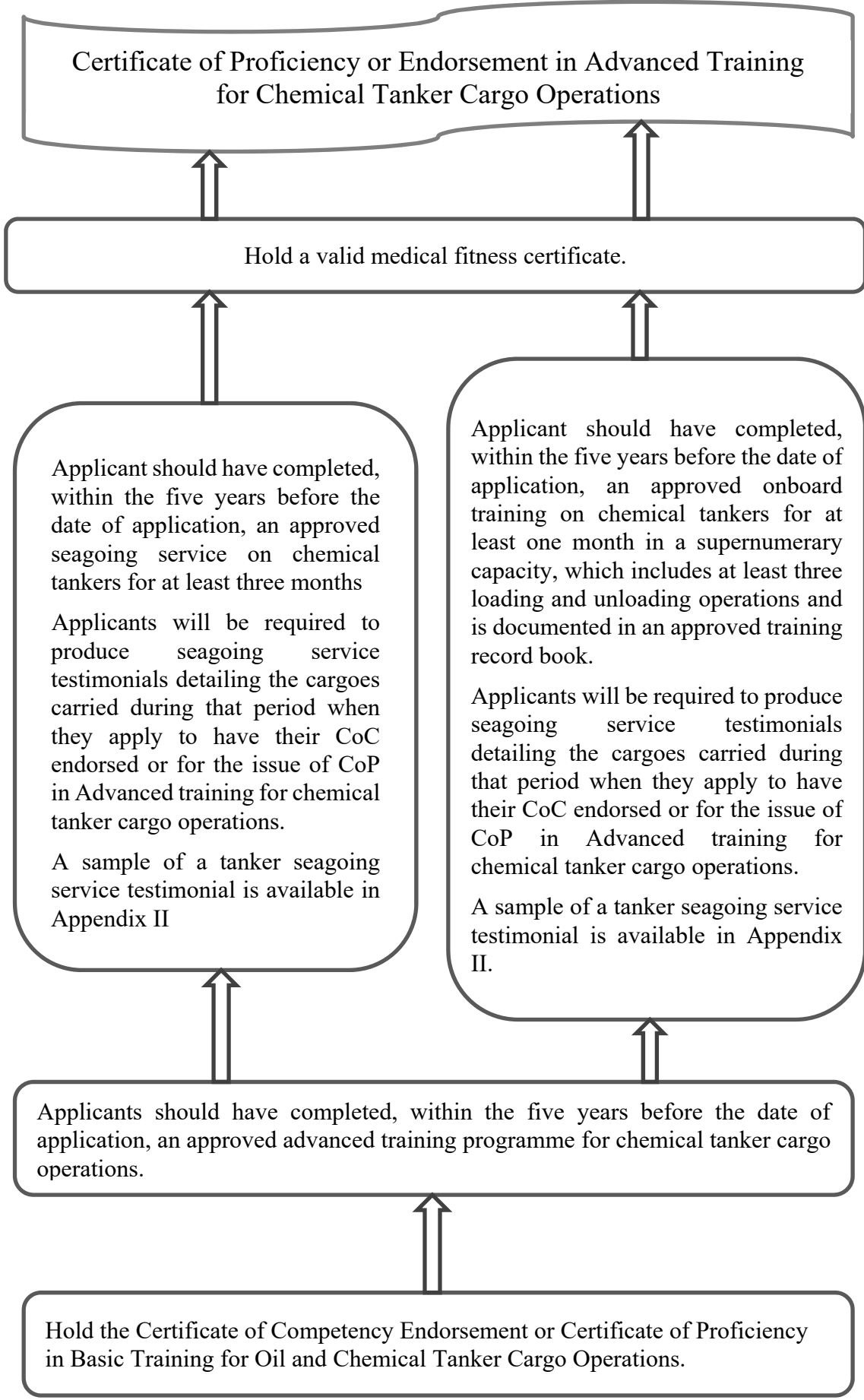


#### **4.4 Certificate of Proficiency or Endorsement in Advanced Training for Chemical Tanker Cargo Operations**

4.4.1 To qualify for the issue of a Certificate of Proficiency or an Endorsement in Advanced Training for Chemical Tanker Cargo Operations in Hong Kong, an applicant must:

- (a) have met the requirements for certification in basic training for oil and chemical tanker cargo operations; and
- (b) while qualified for certification in basic training for oil and chemical tanker cargo operations, have:
  - (i) at least three months of approved seagoing service on chemical tankers, or
  - (ii) at least one month of approved onboard training on chemical tankers, in a supernumerary capacity, which includes at least three loading and three unloading operations and is documented in an approved training record book taking into account guidance in section B-V/1; and
- (c) have completed approved advanced training for chemical tanker cargo operations and have met the standard of competence specified in section AV/1-1, paragraph 3 of the STCW Code (standard of competence is shown in the Appendix I).

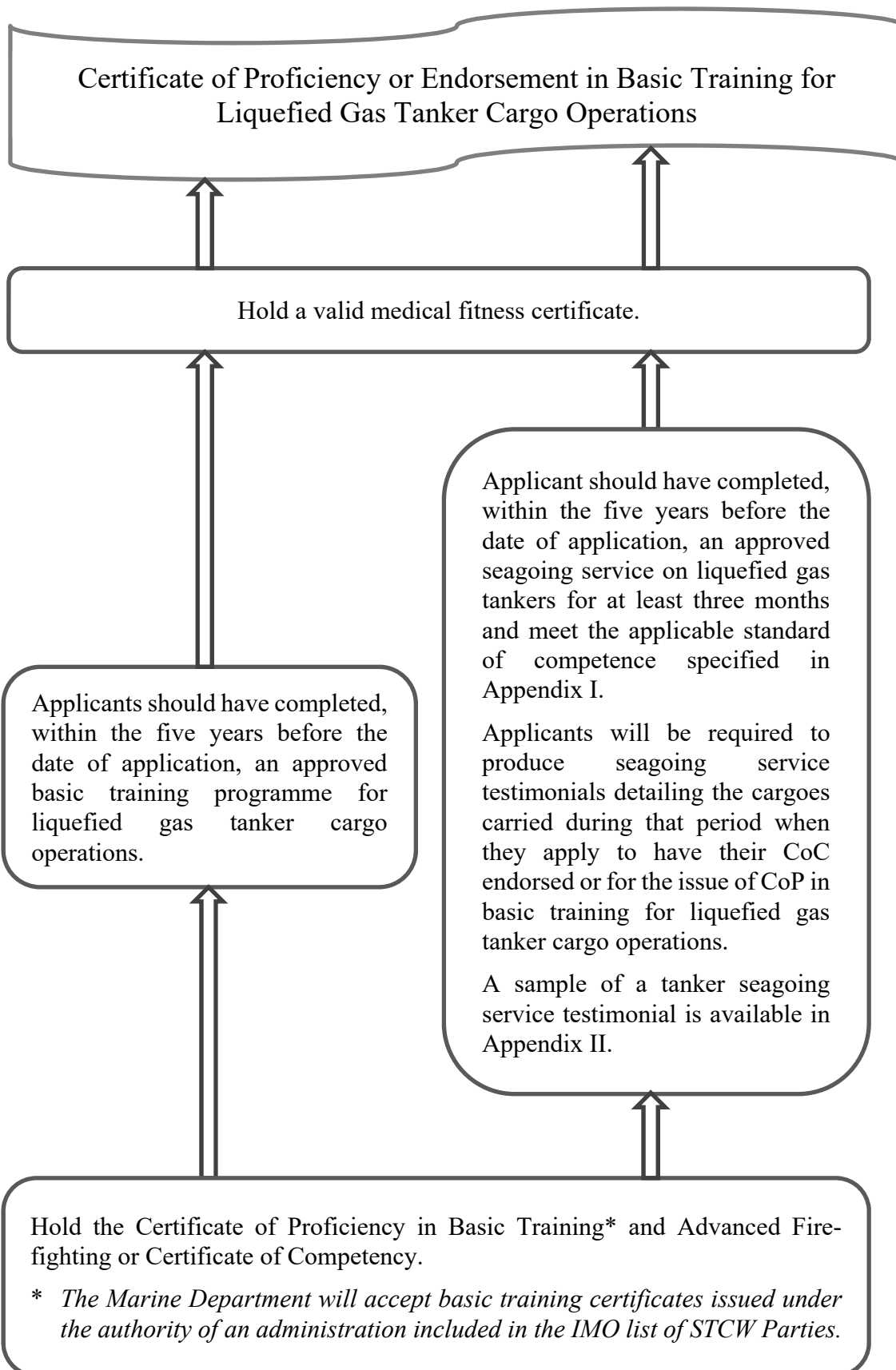




**4.5 Certificate of Proficiency or Endorsement in Basic Training for Liquefied Gas Tanker Cargo Operations**

4.5.1 To qualify for the issue of a Certificate of Proficiency or an Endorsement in Basic Training for Liquefied Gas Tanker Cargo Operations in Hong Kong, an applicant must have completed basic training in accordance with provisions of section A-VI/1 of the STCW Code and must have completed:

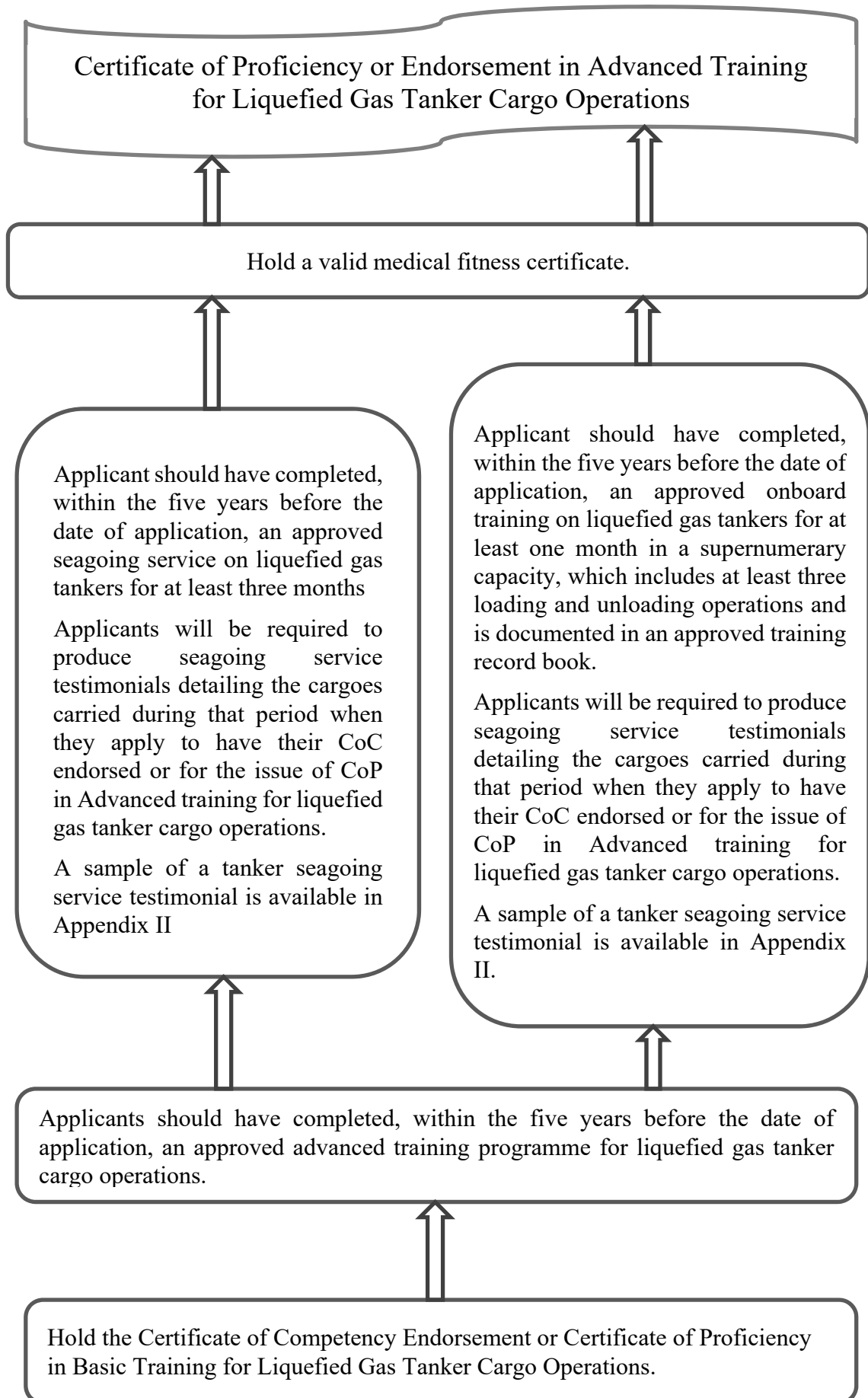
- (a) at least three months of approved seagoing service on liquefied gas tankers and have met the standard of competence specified in section A-V/1-2, paragraph 1 of the STCW Code; or
- (b) an approved basic training for liquefied gas tanker cargo operations and have met the standard of competence specified in section A-V/1-2, paragraph 1 of the STCW Code (standard of competence is shown in the Appendix I).



#### **4.6 Certificate of Proficiency or Endorsement in Advanced Training for Liquefied Gas Tanker Cargo Operations**

4.6.1 To qualify for the issue of a Certificate of Proficiency or an Endorsement in Advanced Training for Liquefied Gas Tanker Cargo Operations in Hong Kong, an applicant must:

- (a) have met the requirements for certification in basic training for liquefied gas tanker cargo operations; and
- (b) while qualified for certification in basic training for liquefied gas tanker cargo operations, have:
  - (i) at least three months of approved seagoing service on liquefied gas tankers, or
  - (ii) at least one month of approved onboard training on liquefied gas tankers, in a supernumerary capacity, which includes at least three loading and three unloading operations and is documented in an approved training record book taking into account guidance in section B-V/1; and
- (c) have completed approved advanced training for liquefied gas tanker cargo operations and have met the standard of competence specified in section AV/1-2, paragraph 2 of the STCW Code (standard of competence is shown in the Appendix I).



#### **4.7 Medical Fitness Certificate**

- 4.7.1 Proof of medical fitness is an essential requirement for the issue of any certificate of proficiency or Endorsement. Medical fitness may be proven by the production of a certificate of medical fitness issued not more than two years beforehand by an approved medical practitioner.
- 4.7.2 Applicants in Hong Kong may obtain from the Mercantile Marine Office a list of medical practitioners who are approved by the Director to issue medical fitness certificates. The list could also be downloaded from the Marine Department's website (<https://www.mardep.gov.hk/filemanager/en/share/pub-services/pdf/regmp.pdf>).

## **SECTION 5**

### **REVALIDATION OF CERTIFICATES OF PROFICIENCY OR ENDORSEMENTS**

#### **5.1 Revalidation of Tanker Endorsements**

- 5.1.1 An endorsement for tanker cargo operations is valid for the period of not more than five (5) years from the date issued.
- 5.1.2 Any person who wishes to revalidate his/her tanker endorsement on his/her Certificate of Competency must
- (a) produce evidence of at least three (3) months' seagoing service within the last five (5) years on each type of tanker for which he/she hold an endorsement, or successfully completed an approved relevant training course; and
  - (b) hold an approved and valid medical fitness certificate.

#### **5.2 Revalidation of Certificates of Proficiency**

- 5.2.1 Certificates of Proficiency issued to ratings are not required to be revalidated and therefore do not carry an expiry date.

## SECTION 6

### ON BOARD TRAINING

#### **6.1 On Board Training Record Book**

- 6.1.1 Conditions stated in paragraph 4.3.1(b)(ii), 4.4.1(b)(ii) and 4.6.1(b)(ii) requires applicant to complete an on board training and is documented in an approved training record book. On board training programme including all the elements listed in paragraph 6.1.3, and the record of the training conducted in accordance with such programme are acceptable to the Director as the approved ones. 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. Such training record book can be one prepared by seafarer's companies or training institutes as well as one published by maritime organizations.
- 6.1.2 An applicant with his/her on board training falls short of the required training elements will be required to compensate by additional seagoing service, training courses or assessment as determined by the Director.
- 6.1.3 With respect to the paragraph 4.3 & 6.3 of Regulation V/1-1 and paragraph 4.3 of Regulation V/1-2 of the STCW Convention, the supervised on board training should at least cover the following elements:
- (a) Safety
    - (i) Ship's safety-management system
    - (ii) Cargo-specific fire-fighting equipment and procedures
    - (iii) Cargo-specific first-aid procedures, including the Medical First Aid Guide for Use in Accidents involving Dangerous Goods (MFAG)
    - (iv) Ship-/cargo-specific hazards, including smoking regulations, oxygen-depleted atmospheres, cargo hydrocarbon narcosis and toxicity
    - (v) Risk assessment systems
    - (vi) Permit to work, including hot work and enclosed spaces entry procedures
    - (vii) Use of personal protective equipment
    - (viii) Dangers and precautions related to handling and storage of cargoes at cryogenic temperatures (*for liquefied gas tankers only*)
  - (b) Construction, cargo, cargo tanks and pipelines
    - (i) Hull/tank construction and limitations
    - (ii) Cargo connections
    - (iii) Properties and hazards associated with the types of cargo being carried, including use of Material Safety Data Sheets (MSDS)
    - (iv) 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
    - (v) Configuration of cargo and ballast system
    - (vi) Pumps and associated equipment
    - (vii) Specialist equipment associated with the cargo operations
    - (viii) Particulars of the tanker's construction and how this affects the cargo operations
    - (ix) Use of segregation, separation and airlocks to maintain gas-safe areas (*for liquefied gas tankers only*)



- (x) Cargo tank, inter-barrier, insulation spaces, and pipeline relief valves and vapour venting systems (*for liquefied gas tankers only*)
  - (xi) Cargo vapour compressors and associated equipment (*for liquefied gas tankers only*)
- (c) Trim and stability
- (i) Tanker's stability information and calculating equipment
  - (ii) Importance of maintaining stress levels within acceptable limits
  - (iii) Dangers of free surface effect and "sloshing" effect
- (d) Cargo operations
- (i) Pre-planning of loading/in-transit care, discharge/ballast operations
  - (ii) Record keeping
  - (iii) Start-up/stopping procedures, including emergency shutdown
  - (iv) Attention required for mooring arrangements during cargo operations
  - (v) Purging and inerting requirements and associated hazards
  - (vi) Loading cargo, including topping-off operations
  - (vii) Discharging cargo, including draining and stripping operations
  - (viii) Monitoring of cargo during loading/discharging operations, including sampling where applicable
  - (ix) Tank gauging and alarm systems
  - (x) Dangers from electrostatic discharge and its prevention
  - (xi) Ballasting and deballasting operations
  - (xii) Maintenance requirements, including coating inspections
  - (xiii) Polymerization, cargo compatibility, tank coating compatibility and other reactions (*for chemical tankers and liquefied gas tankers only*)
  - (xiv) Functions of inhibitors and catalysts (*for chemical tankers and liquefied gas tankers only*)
  - (xv) Vapour/gas dispersion (*for chemical tankers and liquefied gas tankers only*)
  - (xvi) Causes of backpressure and pressure surge effects (*for liquefied gas tankers only*)
  - (xvii) Use of boil-off gas as a fuel (*for liquefied gas tankers only*)
  - (xviii) Purging and cool-down operations (*for liquefied gas tankers only*)
  - (xix) Operation and maintenance of re-liquefaction equipment (*for liquefied gas tankers only*)
  - (xx) Understanding and use of the custody transfer system (*for liquefied gas tankers only*)
  - (xxi) Crude oil washing systems (*for oil tankers only*)
- (e) Tank washing/cleaning
- (i) Tank cleaning systems and equipment fitted on the tanker
  - (ii) Pre-planning of tank washing/cleaning operations
  - (iii) Tank washing procedures, including purging and inerting
  - (iv) Control of slops/waste product
  - (v) Electro-static hazards
  - (vi) Cleanliness requirements
  - (vii) Maintenance requirements
  - (viii) Removal of inhibitors and residues (*for chemical tankers only*)
  - (ix) Use of absorption, cleaning agents and detergents (*for chemical tankers only*)
  - (x) Hot-gassing/boil-off of liquid residues and regasification process (*for liquefied gas tankers only*)
- (f) Inert gas systems
- (i) Inerting system(s) and equipment fitted to the tanker

- (ii) Hazards associated with inerting of spaces, with particular reference to safe entry into tanks
- (iii) Purging, maintaining inert atmosphere and gas-freeing operations
- (iv) Maintenance requirements
- (g) Pollution prevention and control
  - (i) International, flag State and company regulations, documentation and plans
  - (ii) Operation of the tanker's pollution-prevention systems and equipment, including discharge monitoring
  - (iii) Operation of the tanker's pollution-containment equipment
- (h) Gas-detection equipment and instruments
  - (i) Use and calibration of personal, portable and fixed gas analysers, with particular reference to oxygen and hydrocarbon monitoring equipment
  - (ii) Operation, maintenance and limitation of cargo tank level measuring, level alarm and temperature-measuring systems
  - (iii) Operation and maintenance of hull temperature measurement (for liquefied gas tankers only)
- (i) Publications
  - (i) International, flag State and company publications relevant to the operation of the tanker, including SOLAS, MARPOL and applicable guidance manuals
  - (ii) Operating and maintenance manuals specific to the equipment on board
  - (iii) Established industrial standards and code of safe working practice (e.g., ICS, OCIMF, SIGTTO)

6.1.4 The training record book should also contain the following information:

- (a) Personal information of the candidate for certification, such as name, date of birth, residential address, seaman discharge book no. etc.
- (b) Company(ies) information which the candidate has been served such as company name, company address, service period for the particular training programme etc.
- (c) Ship(s) information which the candidate has been served such as ship's name, IMO Number, ship's type, ship's major particulars, engine particulars, lifesaving and fire-fighting equipment, cargo gears, navigational equipment etc.

## APPENDIX I

### STANDARDS OF COMPETENCE

(1): Basic Training for Oil and Chemical Tanker Cargo Operations

Competence (i): Contribute to the safe cargo operation of oil and chemical tankers

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
Basic knowledge of tankers: .1 types of oil and chemical tankers .2 general arrangement and construction Basic knowledge of cargo operations: .1 piping systems and valves .2 cargo pumps .3 loading and unloading .4 tank cleaning, purging, gas-freeing and inerting Basic knowledge of the physical properties of oil and chemicals: .1 pressure and temperature, including vapour pressure/temperature relationship .2 types of electrostatic charge generation .3 chemical symbols Knowledge and understanding of tanker safety culture and safety management	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

Competence (ii): Take precautions to prevent hazards

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
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	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

<p>.6 sources of ignition, including electrostatic hazards</p> <p>.7 toxicity hazards</p> <p>.8 vapour leaks and clouds</p> <p>Basic knowledge of hazard controls:</p> <p>.1 inerting, water padding, drying agents and monitoring techniques</p> <p>.2 anti-static measures</p> <p>.3 ventilation</p> <p>.4 segregation</p> <p>.5 cargo inhibition</p> <p>.6 importance of cargo compatibility</p> <p>.7 atmospheric control</p> <p>.8 gas testing</p> <p>Understanding of information on a Material Safety Data Sheet (MSDS)</p>	
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Competence (iii): Apply occupational health and safety precautions and measures

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
<p>Function and proper use of gas-measuring instruments and similar equipment</p> <p>Proper use of safety equipment and protective devices, including:</p> <p>.1 breathing apparatus and tank-evacuating equipment</p> <p>.2 protective clothing and equipment</p> <p>.3 resuscitators</p> <p>.4 rescue and escape equipment</p> <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> <p>.1 precautions to be taken when entering</p>	<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>

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	
Basic knowledge of first aid with reference to a Material Safety Data Sheet (MSDS)	First aid do's and don'ts

Competence (iv): Carry out fire-fighting operations

Content of Assessment	Criteria for Satisfactory Assessment
Tanker fire response organization and action to be taken	Initial actions and follow-up actions on becoming aware of fire on board conform with established practices and procedures
Fire hazards associated with cargo handling and transportation of hazardous and noxious liquids in bulk	Action taken on identifying muster signal is appropriate to the indicated emergency and complies with established procedures
Fire-fighting agents used to extinguish oil and chemical fires	Clothing and equipment are appropriate to the nature of the firefighting operations
Fixed fire-fighting foam system operations	The timing and sequence of individual actions are appropriate to the prevailing circumstances and conditions
Portable fire-fighting foam operations	Extinguishment of fire is achieved using appropriate procedures, techniques and fire-fighting agents
Fixed dry chemical system operations	
Spill containment in relation to fire-fighting operations	

Competence (v): Respond to emergencies

Content of Assessment	Criteria for Satisfactory Assessment
Basic knowledge of emergency procedures, including emergency shutdown	The type and impact of the emergency is promptly identified and the response actions conform to the emergency procedures and contingency plans

Competence (vi): Take precautions to prevent pollution of the environment from the release of oil or chemicals

Content of Assessment	Criteria for Satisfactory Assessment
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<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> <p>.1 report relevant information to the responsible persons</p> <p>.2 assist in implementing shipboard spill-containment procedures</p>	<p>Procedures designed to safeguard the environment are observed at all times</p>
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(2): Advanced Training for Oil Tanker Cargo Operations

Competence (i): Ability to safely perform and monitor all cargo operations

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
<p><i>Design and characteristics of an oil tanker</i></p> <p>Knowledge of oil tanker design, systems and equipment, including:</p> <p>.1 general arrangement and construction</p> <p>.2 pumping arrangement and equipment</p> <p>.3 tank arrangement, pipeline system and tank venting arrangement</p> <p>.4 gauging systems and alarms</p> <p>.5 cargo heating systems</p> <p>.6 tank cleaning, gas-freeing and inerting systems</p> <p>.7 ballast system</p> <p>.8 cargo area venting and accommodation ventilation</p> <p>.9 slop arrangements</p> <p>.10 vapour recovery systems</p> <p>.11 cargo-related electrical and electronic control system</p>	<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 noncompliance 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> <p>Procedures for monitoring safety systems to ensure that all alarms are detected promptly and acted upon in</p>

<p>.12 environmental protection equipment, including Oil Discharge Monitoring Equipment (ODME)</p> <p>.13 tank coating</p> <p>.14 tank temperature and pressure control systems</p> <p>.15 firefighting 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>.6 `ship-to-ship transfers</p> <p>.7 load on top</p> <p>.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>accordance with established emergency procedures</p>
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Ability to manage and supervise personnel with cargo-related responsibilities	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
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Competence (ii): Familiarity with physical and chemical properties of oil cargoes

Content of Assessment	Criteria for Satisfactory Assessment
<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>	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

Competence (iii): Take precautions to prevent hazards

Content of Assessment	Criteria for Satisfactory Assessment
<p>Knowledge and understanding of the hazards and control measures associated with oil tanker cargo operations, including:</p> <p>.1 toxicity</p> <p>.2 flammability and explosion</p> <p>.3 health hazards</p> <p>.4 inert gas composition</p> <p>.5 electrostatic hazards</p> <p>Knowledge and understanding of dangers of noncompliance with relevant rules/regulations</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

Competence (iv): Apply occupational health and safety precautions

Content of Assessment	Criteria for Satisfactory Assessment
<p>Knowledge and understanding of safe working practices, including risk assessment and personal shipboard safety relevant to oil tankers:</p> <p>.1 precautions to be taken when entering enclosed spaces, including correct use of different types of breathing apparatus</p> <p>.2 precautions to be taken before and during repair and maintenance work</p> <p>.3 precautions for hot and cold work</p>	<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>



.4 precautions for electrical safety	Correct use of breathing apparatus
.5 use of appropriate Personal Protective Equipment (PPE)	Procedures for entry into enclosed spaces are observed

Competence (v): Respond to emergencies

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
Knowledge and understanding of oil tanker emergency procedures, including: <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 firefighting on oil tankers</li> <li>.5 enclosed space rescue</li> <li>.6 use of a Material Safety Data Sheet (MSDS)</li> </ul> Actions to be taken following collision, grounding, or spillage  Knowledge of medical first aid procedures on board oil tankers	The type and impact of the emergency is promptly identified and the response actions conform with established emergency procedures and contingency plans  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  Evacuation, emergency shutdown and isolation procedures are appropriate to the nature of the emergency and are implemented promptly  The identification of and actions taken in a medical emergency conform to current recognized first aid practice and international guidelines

Competence (vi): Take precautions to prevent pollution of the environment

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
Understanding of procedures to prevent pollution of the atmosphere and the environment	Operations are conducted in accordance with accepted principles and procedures to prevent pollution of the environment

Competence (vii): Monitor and control compliance with legislative requirements

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
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	The handling of cargoes complies with relevant IMO instruments and established industrial standards and codes of safe working practice

(3): Advanced Training for Chemical Tanker Cargo Operations

Competence (i): Ability to safely perform and monitor all cargo operations



<p>Ability to perform cargo measurements and calculations</p>	<p>stress conditions remain within safe limits at all times</p>
<p>Knowledge of the effect of bulk liquid cargoes on trim and stability and structural integrity</p>	<p>Potential non-compliance with cargo-related procedures is promptly identified and rectified</p>
<p>Knowledge and understanding of chemical cargo-related operations, including:</p> <ol style="list-style-type: none"> <li>.1 loading and unloading plans</li> <li>.2 ballasting and deballasting</li> <li>.3 tank cleaning operations</li> <li>.4 tank atmosphere control</li> <li>.5 inerting</li> <li>.6 gas-freeing</li> <li>.7 ship-to-ship transfers</li> <li>.8 inhibition and stabilization requirements</li> <li>.9 heating and cooling requirements and consequences to adjacent cargoes</li> <li>.10 cargo compatibility and segregation</li> <li>.11 high-viscosity cargoes</li> <li>.12 cargo residue operations</li> <li>.13 operational tank entry</li> </ol>	<p>Actions taken and procedures followed are correctly identified and appropriate shipboard cargo-related equipment is properly used</p>
<p>Development and application of cargo-related operation plans, procedures and checklists</p>	<p>Calibration and use of monitoring and gas-detection equipment are consistent with safe operational practices and procedures</p>
<p>Ability to calibrate and use monitoring and gas-detection systems, instruments and equipment</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>Ability to manage and supervise personnel with cargo-related responsibilities</p>	

Competence (ii): Familiarity with physical and chemical properties of chemical cargoes

Content of Assessment	Criteria for Satisfactory Assessment
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<p>Knowledge and understanding of the chemical and the physical properties of noxious liquid substances, including:</p> <ol 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> </ol> <p>Understanding the information contained in a Material Safety Data Sheet (MSDS)</p>	<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>
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Competence (iii): Take precautions to prevent hazards

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
<p>Knowledge and understanding of the hazards and control measures associated with chemical tanker cargo operations, including:</p> <ol 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> </ol> <p>Knowledge and understanding of dangers of non-compliance with relevant rules/regulations</p>	<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>

Competence (iv): Apply occupational health and safety precautions

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
<p>Knowledge and understanding of safe working practices, including risk assessment and personal shipboard safety relevant to chemical tankers:</p>	<p>Procedures designed to safeguard personnel and the ship are observed at all times</p>

.1 precautions to be taken when entering enclosed spaces, including correct use of different types of breathing apparatus	Safe working practices are observed and appropriate safety and protective equipment is correctly used
.2 precautions to be taken before and during repair and maintenance work	Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns
.3 precautions for hot and cold work	Correct use of breathing apparatus
.4 precautions for electrical safety	Procedures for entry into enclosed spaces are observed
.5 use of appropriate Personal Protective Equipment (PPE)	

Competence (v): Respond to emergencies

Content of Assessment	Criteria for Satisfactory Assessment
<p>Knowledge and understanding of chemical tanker emergency procedures, including:</p> <p>.1 ship emergency response plans</p> <p>.2 cargo operations emergency shutdown</p> <p>.3 actions to be taken in the event of failure of systems or services essential to cargo</p> <p>.4 fire-fighting on chemical tankers</p> <p>.5 enclosed space rescue</p> <p>.6 cargo reactivity</p> <p>.7 jettisoning cargo</p> <p>.8 use of a Material Safety Data Sheet (MSDS)</p> <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>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 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 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>

Competence (vi): Take precautions to prevent pollution of the environment

Content of Assessment	Criteria for Satisfactory Assessment
Understanding of procedures to prevent pollution of the atmosphere and the environment	Operations are conducted in accordance with accepted principles and procedures to prevent pollution of the environment

Competence (vii): Monitor and control compliance with legislative requirements

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
<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 Code and related documents</p>	<p>The handling of cargoes complies with relevant IMO instruments and established industrial standards and codes of safe working practice</p>

(4): Basic Training for Liquefied Gas Tanker Cargo Operations

Competence (i): Contribute to the safe operation of a liquefied gas tanker

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
<p><i>Design and operational characteristics of liquefied gas tankers</i></p> <p>Basic knowledge of liquefied gas tankers</p> <p>.1 types of liquefied gas tankers</p> <p>.2 general arrangement and construction</p> <p>Basic knowledge of cargo operations:</p> <p>.1 piping systems and valves</p> <p>.2 cargo handling equipment</p> <p>.3 loading, unloading and care in transit</p> <p>.4 emergency shutdown (ESD) system</p> <p>.5 tank cleaning, purging, gas-freeing and inerting</p> <p>Basic knowledge of the physical properties of liquefied gases, including:</p> <p>.1 properties and characteristics</p> <p>.2 pressure and temperature, including vapour pressure/temperature relationship</p> <p>.3 types of electrostatic charge generation</p> <p>.4 chemical symbols</p> <p>Knowledge and understanding of tanker safety culture and safety management</p>	<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>

Competence (ii): Take precautions to prevent hazards

Content of Assessment	Criteria for Satisfactory Assessment
<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</li> <li>.7 electrostatic hazards</li> <li>.8 toxicity hazards</li> <li>.9 vapour leaks and clouds</li> <li>.10 extremely low temperatures</li> <li>.11 pressure hazards</li> </ul> <p>Basic knowledge of hazard controls:</p> <ul style="list-style-type: none"> <li>.1 inerting, drying 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>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>

Competence (iii): Apply occupational health and safety precautions and measures

Content of Assessment	Criteria for Satisfactory Assessment
<p>Function and proper use of gas-measuring instruments and similar equipment</p>	

<p>Proper use of safety equipment and protective devices, including:</p> <ol 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> </ol> <p>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:</p> <ol 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> </ol> <p>Basic knowledge of first aid with reference to a Material Safety Data Sheet (MSDS)</p>	<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>
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Competence (iv): Carry out fire-fighting operations

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
<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>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>



Competence (v): Respond to emergencies

Content of Assessment	Criteria for Satisfactory Assessment
Basic knowledge of emergency procedures, including emergency shutdown	The type and impact of the emergency is promptly identified and the response actions conform to the emergency procedures and contingency plans

Competence (vi): Take precautions to prevent pollution of the environment from the release of liquefied gases

Content of Assessment	Criteria for Satisfactory Assessment
<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> <p>.1 report relevant information to the responsible persons</p> <p>.2 assist in implementing shipboard spill-containment procedures</p> <p>.3 prevent brittle fracture</p>	Procedures designed to safeguard the environment are observed at all times

(5): Advanced Training for Liquefied Gas Tanker Cargo Operations

Competence (i): Ability to safely perform and monitor all cargo operations

Content of Assessment	Criteria for Satisfactory Assessment
<p><i>Design and characteristics of a liquefied gas tanker</i></p> <p>Knowledge of liquefied gas tanker design, systems, and equipment, including:</p> <p>.1 types of liquefied gas tankers and cargo tanks construction</p> <p>.2 general arrangement and construction</p> <p>.3 cargo containment systems, including materials of construction and insulation</p> <p>.4 cargo-handling equipment and instrumentation, including:</p> <p>4.1 cargo pumps and pumping arrangements</p>	<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>

<p>4.2 cargo pipelines and valves</p> <p>4.3 expansion devices</p> <p>4.4 flame screens</p> <p>4.5 temperature monitoring systems</p> <p>4.6 cargo tank level-gauging systems</p> <p>4.7 tank pressure monitoring and control systems</p> <p>.5 cargo temperature maintenance system</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>Proficiency to apply safe preparations, procedures and checklists for all cargo operations, including:</p> <p>.1 post docking and loading:</p> <p>1.1 tank inspection</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 noncompliance 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> <p>Calibration and use of monitoring and gas-detection equipment is consistent with safe operational practices and procedures</p>
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- 1.2 inerting (Oxygen reduction, dewpoint reduction)
- 1.3 gassing-up
- 1.4 cooling down
- 1.5 loading
- 1.6 deballasting
- 1.7 sampling, including closed-loop sampling
- .2 sea passage:
  - 2.1 cooling down
  - 2.2 pressure maintenance
  - 2.3 boil-off
  - 2.4 inhibiting
- .3 unloading:
  - .3.1 unloading
  - .3.2 ballasting
  - .3.3 stripping and cleaning systems
  - .3.4 systems to make the tank liquid-free
- .4 pre-docking preparation:
  - .4.1 warm-up
  - .4.2 inerting
  - .4.3 gas-freeing
- .5 ship-to-ship transfer

Procedures for monitoring and safety systems ensure that all alarms are detected promptly and acted upon in accordance with established procedures

Proficiency to perform cargo measurements and calculations, including:

- .1 liquid phase
- .2 gas phase
- .3 On Board Quantity (OBQ)
- .4 Remain On Board (ROB)
- .5 boil-off cargo calculations

Proficiency to manage and supervise personnel with cargo-related responsibilities	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
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Competence (ii): Familiarity with physical and chemical properties of liquefied gas cargoes

Content of Assessment	Criteria for Satisfactory Assessment
<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> <ol 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: <ol style="list-style-type: none"> <li>2.1 simple gas laws</li> <li>2.2 states of matter</li> <li>2.3 liquid and vapour densities</li> <li>2.4 diffusion and mixing of gases</li> <li>2.5 compression of gases</li> <li>2.6 reliquefaction and refrigeration of gases</li> <li>2.7 critical temperature of gases and pressure</li> <li>2.8 flashpoint, upper and lower explosive limits, auto-ignition temperature</li> <li>2.9 compatibility, reactivity and positive segregation of gases</li> <li>2.10 polymerization</li> <li>2.11 saturated vapour pressure/reference temperature</li> <li>2.12 dewpoint and bubble point</li> <li>2.13 lubrication of compressors</li> <li>2.14 hydrate formation</li> </ol> </li> <li>.3 the properties of single liquids</li> </ol>	<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>

<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>	
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Competence (iii): Take precautions to prevent hazards

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
<p>Knowledge and understanding of the hazards and control measures associated with liquefied gas tanker cargo operations, including:</p> <p>.1 flammability</p> <p>.2 explosion</p> <p>.3 toxicity</p> <p>.4 reactivity</p> <p>.5 corrosivity</p> <p>.6 health hazards</p> <p>.7 inert gas composition</p> <p>.8 electrostatic hazards</p> <p>.9 polymerizing cargoes</p> <p>Proficiency to calibrate and use monitoring and gas-detection systems, instruments and equipment</p> <p>Knowledge and understanding of dangers of noncompliance with relevant rules/regulations</p>	<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>

Competence (iv): Apply occupational health and safety precautions

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
<p>Knowledge and understanding of safe working practices, including risk assessment and personal shipboard safety relevant to liquefied gas tankers, including:</p> <p>.1 precautions to be taken when entering enclosed spaces (such as compressor</p>	<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>

rooms), including the correct use of different types of breathing apparatus	Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns  Correct use of breathing apparatus
.2 precautions to be taken before and during repair and maintenance work, including work affecting pumping, piping, electrical and control systems	
.3 precautions for hot and cold work	
.4 precautions for electrical safety	
.5 use of appropriate Personal Protective Equipment (PPE)	
.6 precautions for cold burn and frostbite	
.7 proper use of personal toxicity monitoring equipment	

Competence (v): Respond to emergencies

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
<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 cargo operations</p> <p>.5 firefighting on liquefied gas tankers</p> <p>.6 jettisoning of cargo</p> <p>.7 enclosed space rescue</p> <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>	<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> <p>The identification of and actions taken in a medical emergency conform to current recognized first aid practice and international guidelines</p>

Competence (vi): Take precautions to prevent pollution of the environment

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
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Understanding of procedures to prevent pollution of the environment	Operations are conducted in accordance with accepted principles and procedures to prevent pollution of the environment
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Competence (vii): Monitor and control compliance with legislative requirements

<b>Content of Assessment</b>	<b>Criteria for Satisfactory Assessment</b>
<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>The handling of liquefied gas cargoes complies with relevant IMO instruments and established industrial standards and codes of safe working practices</p>

**APPENDIX II**

**SPECIMEN REPORT OF SHIPBOARD SERVICE OR TRAINING FOR  
THE ISSUE OF A TANKER ENDORSEMENT OR CERTIFICATE OF PROFICIENCY**

**Report of Tanker Seagoing Service**

This is to certify that ..... (FULL NAME OF THE OFFICER) ..... has served as  
..... (RANK) ..... in M.V. / S.S. .... between  
the following dates ..... and ..... . During this time, the ship carried  
the following type(s) of cargo(es)<sup>†</sup>:

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I consider ..... (FULL NAME OF THE OFFICER) ..... to be competent to carry out cargo  
handling duties safely in an \*oil tanker / \*chemical tanker / \*liquefied gas tanker.

Signature: \_\_\_\_\_

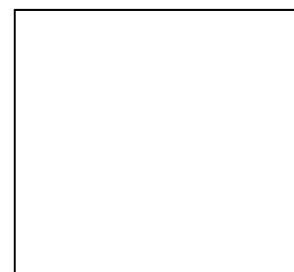
Name of Chief Engineer: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Name of Master: \_\_\_\_\_

Date: \_\_\_\_\_



Ship Stamp

<sup>†</sup> The description of the type of cargo(es) carried during the period should be described in terms identifiable in terms within the IBC Code or IGC Code.

\* Delete as appropriate



## Report of Ship-board Training as a Supernumerary

This is to certify that ..... (FULL NAME OF THE OFFICER) ..... has served as in a supernumerary capacity in M.V. / S.S. .... between the following dates ..... and ....., and during this time, has undergone a programme of at least one month ship-board training in cargo operations. There are ..... loading and ..... unloading cargo operations during the training period (at least 3 loading and 3 unloading operations). The ship was carrying the following type(s) of cargo(es)<sup>†</sup>, or was on ballast voyages between carrying such cargo(es):

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I consider ..... (FULL NAME OF THE OFFICER) ..... now has an overall appreciation of \*oil tanker / \*chemical tanker / \*liquefied gas cargo operations.

Signature: \_\_\_\_\_

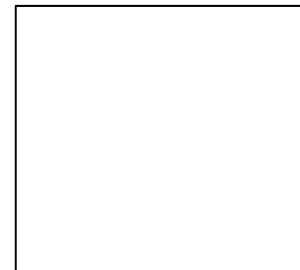
Name of Chief Engineer: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Name of Master: \_\_\_\_\_

Date: \_\_\_\_\_



Ship Stamp

<sup>†</sup> The description of the type of cargo(es) carried during the period should be described in terms identifiable in terms within the IBC Code or IGC Code.

\* Delete as appropriate