MARINE DEPARTMENT
GOVERNMENT OF THE HONG KONG
SPECIAL ADMINISTRATIVE REGION

River Trade Certificates of Competency and Type Rating Certificates for Marine Engineer Officers' Determinations

(2024 Edition)

Made under Regulation 8 of the
Merchant Shipping (Seafarers)(Certification of Officers) Regulation

MD. 715 (Rev.09/2024)

MERCHANT SHIPPING (SEAFARERS) ORDINANCE
(CHAPTER 478)

River Trade Certificates of Competency and Type Rating Certificates for Marine Engineer Officers' Determinations

(2024 Edition)

Made under regulation 8 of the
Merchant Shipping (Seafarers)(Certification of Officers) Regulation (Cap.478J)

Marine Department
The Hong Kong Special Administrative Region

First Edition 2024

[Previous : Certificates of Competency and Licence for Marine Engineer Officers and Electro-technical Officers Determinations (2012 Edition)]

TABLE OF CONTENTS

		Page
Chapter 1 -	Commencement, Interpretation and General Requirements	1
Chapter 2 -	General Provisions	4
Chapter 3 -	River Trade Certificates of Competency	
Part I	Classes of Certificates	11
Part II	General Requirements	14
Part III	Examinations and Exemptions	16
Part IV	Revalidation of Certificates	18
Chapter 4 -	Examination Syllabuses	
Part I	Class 3 Marine Engineer Officer Certificate (River Trade)	21
Part II	Class 2 Marine Engineer Officer Certificate (River Trade)	25
Part III	Class 1 Marine Engineer Officer Certificate (River Trade)	34
Chapter 5 -	Type Rating Certificate (TRC) for Dynamically Supported Craft (DSC) or High-Speed Craft (HSC)	46
APPENDIX		
Appendix I	Standard Form of Documents	
	Form 1 Sea Service Testimonial	49

CHAPTER 1

COMMENCEMENT, INTERPRETATION AND GENERAL REQUIREMENTS

1.1 Commencement

1.1.1 The River Trade Certificates of Competency and Type Rating Certificates for Marine Engineer Officers' Determinations (the Determinations) are made by the Seafarers' Authority under powers granted by the Merchant Shipping (Seafarers) (Certification of Officers) Regulation and shall be effect on xx September 2024.

1.1.2 The Determinations supersede all previously published Determinations regarding certification and licensing of marine engineer officers for coastal-going ships.

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 purposes of the Determinations, Director of Marine is the Authority;

"river trade certificate of competency" means a river trade certificate of competency issued by the Director under the sections 4(4) and 6(4) Merchant Shipping (Seafarers) (Certification of Officers) Regulation;

"certificate of proficiency" means a certificate, other than a certificate of competency or a Licence, issued to a seafarer, stating that the relevant requirements of training, competencies or seagoing service under the STCW Convention have been met;

"chief engineer officer" means the senior engineer officer responsible for the mechanical propulsion and the operation and maintenance of the mechanical and electrical installations of the ship;

"Director" means the Director of Marine;

"dynamically supported ship or craft (DSC)" means any vessel as defined in the International Maritime Organization's Assembly Resolution A.373(X) "Code of Safety for Dynamically supported Craft";

"examiner" means a person appointed by the Director to be an Examiner of Marine Engineers;

"fishing vessel" means a vessel for the time being employed in sea fishing or a fishery research vessel, but does not include a vessel used otherwise than for commercial purposes;

"high-speed craft (HSC)" means high-speed craft as defined in the HSC Code;

"licence" means a licence issue under Part V of the Merchant Shipping (Seafarers) (Certification of Officers) Regulation;

"master" means the person having command of a ship;

"**month"** means a calendar month or 30 days made up of periods of less than one month;

"propulsion power" means the total maximum continuous rated output power, in kilowatts, of all the ship's main propulsion machinery which appears on the ship's certificate of registry or other official document;

"pleasure vessel" means any launch, yacht, inflatable vessel, junk, lorcha or other vessel howsoever propelled that –
(a) is possessed or used exclusively for pleasure purposes; and
(b) is not let for hire or reward other than under the terms of a charter agreement or hire-purchase agreement, but does not include any launch, yacht, inflatable vessel, junk, lorcha or other vessel that has never been launched;

"river trade" means navigation and the carrying out of marine operations within river trade limits as defined in the Merchant Shipping (Seafarers) Ordinance (Cap.478);

"river trade service" means service on board coastal-going ships operating within river trade limits as a seafarer of relevant discipline, relevant to the issue or revalidation of a river trade certificate of competency or other qualification;

"seagoing" means beyond the limit of the river trade area as defined in the Merchant Shipping (Seafarers) Ordinance (Cap.478);

"seagoing service" means service on board a seagoing ship relevant to the issue or revalidation of seagoing certificate of competency or other qualification under STCW;

"sea service" means the river trade service and seagoing service;

"second engineer officer" means the engineer officer next in rank to the chief engineer officer and upon whom the responsibility for the mechanical propulsion and the operation and maintenance of the mechanical and electrical installations of the ship will fall in the event of the incapacity of the chief engineer officer;

"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 that applies to Hong Kong;

"STCW 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 the Convention that applies to Hong Kong;

"STCW Regulation" means a Regulation contained in Attachment 1 to the Final Act of the 2010 Manila Conference of Parties to the STCW Convention.

"Type Rating Certificate (TRC)" means a Certificate to man a specific station on a particular type and model of dynamically supported craft or high-speed craft. TRC is to be issued by the Director under section 4(6), section 6(6) of the Merchant Shipping (Seafarers) (Certification of Officers) Regulation.

1.3 General Requirements

1.3.1 The subsequent chapters of these Determinations set out the training and qualification requirements for marine engineer officers and the conditions to be satisfied by any person to qualify for a certificate of competency (marine engineer officer) (river trade) as a marine engineer officer or an extension of the validity of such a certificate, or an endorsement to such a certificate, the manner in which the attainment of such standards or the satisfaction of such conditions is to be established, the procedure for the conduct of examinations, and the subjects and syllabuses for those examinations.

1.3.2 The officers manning the station of Chief Engineer or Second Engineer of any river trade passenger DSC/HSC or any river trade cargo DSC/HSC of 500 gross tonnage or above shall, in addition to hold the appropriate certificate of competency (marine engineer officer) (river trade), be required to hold a valid Type Rating Certificate (TRC) for the type and model of craft in which he intends to serve. The conditions to qualify or revalidate a TRC, and the procedure for the examinations and the syllabus of the examination are set out in Chapter 4 of these Determinations.

1.3.3 Any candidate who feels aggrieved by any decision of the examiner may appeal to the Director within thirty (30) days of being informed of such decision.

1.3.4 The Director may, at his discretion, permit exemption from all or any provision of these Determinations.

CHAPTER 2

GENERAL PROVISIONS

2.1 Classes of Certificates and their Validity

2.1.1 The classes of river trade certificates of competency as follows:

River Trade

Certificate of Competency (Marine Engineer Officer) (River Trade) Class 1
Certificate of Competency (Marine Engineer Officer) (River Trade) Class 2
Certificate of Competency (Marine Engineer Officer) (River Trade) Class 3

2.1.2 River trade certificates of competency are only valid for service on coastal-going ships trading within river trade limits.

2.1.3 All river trade certificates of competency are valid for a period of not more than five (5) years and fall due for revalidation on the expiry date shown on the certificate.

2.1.4 In order to revalidate a river trade certificate of competency, the holder must show evidence of meeting the conditions for revalidation which are set out in Part IV of Chapter 3.

2.2 Proof of Nationality

2.2.1 All candidates for examination for a certificate of competency will be required to produce proof of name, nationality and date of birth.

2.3 Medical Fitness Certificate

2.3.1 All candidates for any river trade certificate of competency will be required to produce a valid medical fitness certificate issued under the standard of Merchant Shipping (Seafarers) (Medical Examination) Regulation by an approved medical practitioner or equivalent. A medical fitness certificate is not to be valid for more than two years from the date of issue.

2.4 Date and Place of Examination

2.4.1 The dates upon which written examinations are to be held in the following year will be published annually in a Gazette Notice issued by the Director. It is also published in MD website: https://www.mardep.gov.hk/en/public-services/exam-for-seafarers/index.html.

2.4.2 Candidates for examination will be informed, at the time of making application, of the place at which the examination will be held.

2.4.3 Candidates who are making application for any examination should follow the procedure set out under paragraph 2.5, ensuring that their application is lodged at least thirty (30) days prior to the commencement date of the examination upon which they wish to be examined. The time and date of the examination will then be advised. Application less than thirty (30) days prior the examination day is only accepted case by case upon the examiner's consideration and seat available.

2.5 Application

2.5.1 Candidates for either a part, or for the whole, of any river trade certificate of competency examination must complete an application form (MD 695) which may be obtained from the Marine Department, River Trade and Local Examination Section, or by post from:

Marine Department,
River Trade and Local Examination Section,
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/index.html).

2.5.2 Applicants should return the completed form to the River Trade and Local Examination Section at least thirty (30) days prior to the commencement date of the examination upon which the applicants intend to sit for the examination, together with:

(a) the examination fee;

(b) passport type photographs (50mm x 40mm);

(c) sea service testimonials;

(d) Seafarers' Employment Registration Book or Certificates of Discharge;

(e) proof of nationality, name and date of birth;

(f) medical fitness certificate;

(g) where appropriate

  (i) existing certificate of competency;

  (ii) documentary evidence on technical education and practical training;

  (iii) subsidiary course certificates.

Submission of application could be sent via email, post, or Public Form Submission Services (PFSS) in EBS of MD website. The original document should not be sent through post, but should be presented to the examiner prior to the examination if required.

2.5.3 Candidates who have made a previous attempt when making application for re-examination must also submit their copy of the record of results issued by the examiner following their previous attempt.

2.5.4 It is important that the correct procedure for application is followed as Seafarers' Employment Registration Book and sea service testimonials should be submitted for verification which can take time. In the absence of such verification the candidate cannot be accepted for examination.

2.5.5 Candidates who fail in all, or in a part, of an examination, or whose examination result being expired, may attend for the next scheduled examination for the relevant certificate provided that accommodation is available in the examination hall, even if this means that they are unable to give the full one month notice as required by paragraph 2.5.2. In order to utilize this facility candidates must submit written application to resit the examination, or part of examination, together with the appropriate fee, immediately upon receiving notification of the examination results.

2.6 Enquiries

2.6.1 Candidates may make enquiries about examinations and when doing so, should ensure that the point on which information is sought is clearly stated. Enquiries should be addressed to:

The Examiner of Engineers,
Marine Department,
3/F Harbour Building,
38 Pier Road,
Central,
Hong Kong.

Tel: (852) 2852 4364
Fax: (852) 2541 6754
E-mail: seexam@mardep.gov.hk

2.6.2 Candidates writing to request a provisional estimate of their sea service should include a detailed summary of their sea service with the enquiry but should not include original documents.

2.7 Particulars of Sea Service

2.7.1 A candidate's eligibility for examination will depend, amongst other factors, on the amount of seagoing/river trade service performed and upon the ranks in which the candidate has served. It is therefore imperative that the particulars which candidates record on the application form are accurately stated.

2.7.2 The amount of sea service set down in these Determinations for each class of river trade certificate of competency is the absolute minimum that can be accepted. Unless candidates can prove the required amount they will not be issued a river trade certificate of competency after the passing of examinations.

2.7.3 Notwithstanding the sea services requirements stipulated in paragraphs 2.16.2, 3.3.1(c), 3.4.1(b) and 3.5.1(a), the applicant can sit for the examination upon completing two third required sea service set down in this Determination for each class of river trade certificate of competency. However, in order to attain the certificate of

competency (marine engineer officer) (river trade), he ought to have fulfilled sea service requirement.

2.8 Testimonials

2.8.1 Candidates for river trade certificates of competency must produce testimonials in respect of all sea service performed. These testimonials, which should state the seniority on watch, the type of main propelling machinery and the nature of duties performed, are to be signed by the Chief Engineer Officer and endorsed by the Master or the Technical/Engineering/Marine Manager. In the case of service as Chief Engineer Officer, the testimonials should be signed by the Technical/Engineering/Marine Manager or some other responsible representative of the employer. A specimen copy of the form of testimonial recommended for this purpose is shown in the Appendix I. Testimonials will be returned to candidates when the examination is completed.

2.8.2 Testimonials or certificates of sea service should include reports as to the candidate's character, sobriety, experience and ability for the full period of service covered by the application for examination.

2.9 Use of Information

2.9.1 Information required by the application form will be used by Marine Department for process of application for examination and issue of certificate. 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 river trade certificate of competency by any third parties.

2.9.2 The supply of information is obligatory. A candidate should ensure that all the information filled in the application form is accurate. Failure to do so may, besides subject to paragraph 2.10, result in an unsuccessful application.

2.9.3 For making correction and access to personal data after submission of application form, a candidate may contact the following officer:

Officer-in-charge
Marine Department,
River Trade and Local Examination Section,
3/F Harbour Building,
38 Pier Road,
Central,
Hong Kong.

Tel: (852) 2852 4364
Fax: (852) 2541 6754
E-mail: seexam@mardep.gov.hk, ssrtl@mardep.gov.hk

2.10 Fraud or Misrepresentation

2.10.1 Candidates are reminded that the Merchant Shipping (Seafarers) (Certification of Officers) Regulation provides that any person who, in connection with an application for the issue of a river trade certificate of competency, or in connection with the endorsement to, or extension of validity of, a river trade certificate of competency:

(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 to a fine and to imprisonment.

2.11 Attempted Bribery

2.11.1 Any candidate 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 a candidate will not be re-examined for such a period as may be decided by the Director.

2.12 Unsatisfactory Conduct

2.12.1 Candidates, who have neglected to join their vessels after signing crew agreements, or who have left their vessels after joining, other than upon discharge, or who have been under the influence of alcohol/drugs while performing designated duties, or who have committed misconduct on board, will be required to produce satisfactory proof of two years subsequent service at sea with good conduct unless the Director, after investigation, should see fit to reduce this period.

2.13 Deafness and other Physical or Mental Handicaps

2.13.1 If, in the course of any examination, the examiner finds that a candidate is afflicted with deafness, an impediment in speech, or with some other physical or mental handicap which he considers sufficient to render the candidate incapable of discharging adequately the ordinary coastal-going ship duties of the holder of a river trade certificate of competency, he will not allow the candidate to complete the examination and the candidate will be refunded of the examination fee.

2.13.2 If such a candidate subsequently produces a medical certificate to the effect that the particular handicap has been overcome or has improved or that the candidate's condition is now normal, the Director will consider the candidate for re-examination.

2.14 Knowledge of English and Languages for Conduct of Examination

2.14.1 All candidates applying examination for river trade certificates of competency must demonstrate to the satisfaction of the examiner that they can speak and write English sufficiently well to perform the duties required on a coastal-going ships operating in river trade limits.

2.14.2 Candidates applying examination for river trade certificates of competency may choose to have the examination conducted in English or Chinese. Candidates must specify

their language of choice at the time of making the application. Candidates who choose to have the examination conducted in English may have all the written and oral examinations conducted in English. But candidates who choose to have the examination conducted in Chinese shall be required to have at least one professional subject in the written examinations to be examined in English and also part of the oral examination to be conducted in English.

2.14.3 Candidates for written examinations which are conducted in English will be expected to demonstrate a reasonable standard of grammar, spelling and composition in their answers.

2.14.4 Candidates for written examinations which are conducted in Chinese will be expected to demonstrate a reasonable standard of grammar, fluency, accuracy and the comprehensive ability in the use of Chinese language.

2.15 Issue of Certificates

2.15.1 Candidates who are successful in all parts of an examination, and who meet all the requirements for the issue of a certificate of competency (marine engineer officer) (river trade) of the class applied for, will be issued with a certificate of competency (marine engineer officer) (river trade). The river trade certificate of competency will issue in electronic format PDF document (e-Certificate). When the e-Certificate is ready, candidates will be notified by email, or mobile phone short message to the candidates' email address or mobile phone as given on the application form. The candidate can download the e-Certificate from the portal of MD website https://www.mardep.gov.hk/download/index.html.

2.15.2 A candidate who has passed all parts of the examination but who has not yet obtained the subsidiary qualifications necessary to become eligible for the issue of a certificate of competency (marine engineer officer) (river trade) will be issued with a record of results. Upon production of this form and proof that the requisite subsidiary qualifications have been obtained the candidate will be issued with a certificate of competency (marine engineer officer) (river trade) in the normal manner in paragraph 2.15.1. The period from the date of last examination shall not exceed 5 years. If it exceeds 5 years and less than 10 years, additional approved oral examination may be necessary prior to the issue of certificate of competency (marine engineer officer) (river trade). If it exceeds 10 years, full examination shall be required.

2.15.3 All other candidates for the examination will receive a record of results which should be retained and produced at any subsequent examinations.

2.15.4 To avoid unnecessary delays in the issue of certificates, it is important that candidates should inform the examiner promptly of any change of information (e.g. email and mobile phone number) given on the application form.

2.16 Insufficient Service

2.16.1 If after a candidate has passed the examination, it is discovered that his sea service is insufficient to entitle him to receive a certificate of competency (marine engineer officer) (river trade) of the class for which he has been examined, he will not be issued with such a certificate of competency (marine engineer officer) (river trade). If,

however, the Director is satisfied that the error in the calculation of sea service did not occur through any fault or misrepresentation on the part of the candidate, the appropriate certificate will be granted when he has made up the deficiency in sea service.

2.16.2 In case of a candidate has passed the examination under the arrangement in paragraph 2.7.3 (i.e. permission to sit the examination after obtained two third (2/3) sea service), the examination result will be recorded in MD, the certificate of competency (marine engineer officer) (river trade) will be issued upon the sufficient sea service being obtained.

2.17 Fees

2.17.1 Applicants for examination will be required to pay the appropriate examination fees before any steps are taken to verify their eligibility for examination. Candidates who are found to be ineligible will have their fees returned.

2.17.2 The fee paid for examination for a certificate of competency (marine engineer officer) (river trade) is not refundable in the event of a candidate's failure to pass.

2.17.3 A candidate who fails to appear in any part of any examination at the appointed time may be regarded as having failed by default in that part of the examination and the examination fee will be forfeited unless the candidate produces reasonable proof that failure to attend was unavoidable.

2.17.4 Details of the current scale of fees may be obtained from River Trade and Local Examination Section, or the Schedule of the Merchant Shipping (Seafarers) (Fees) Regulation, Cap.478AB (https://www.elegislation.gov.hk/hk/cap478AB).

2.17.5 A candidate who due to circumstances beyond his control, has to postpone an examination for which he has already made application, may do so for one opportunity only in a maximum period of one year beyond the date of the examination applied for. A candidate wishing to postpone an examination should apply in writing not less than three (3) working days in advance of the examination. When he subsequently applies to sit the postponed examination, he will be required to pay any increase in fee which may have come into effect since his original application.

2.17.6 If the candidate wishes to be examined at a date one year after the date of the previously arranged examination, his paid examination fee will be forfeited and he will be required to resubmit his application with fee as if it is a new application.

2.18 Issue of Replacement Certificate

2.18.1 If a certificate of competency is lost, the holder may apply to the River Trade and Local Examination Section for a replacement certificate (with new Unique Tracking Number(UTN)). A fee will be charged for the replacement certificate unless the holder can show that the loss was as a result of shipwreck or fire. An applicant for a replacement certificate will be required to make a declaration to the examiner regarding the circumstances in which the certificate was lost.

CHAPTER 3

RIVER TRADE CERTIFICATES OF COMPETENCY

PART I

CLASSES OF CERTIFICATES

3.1 **General**

3.1.1 Certificates of competency (marine engineer officer) (river trade) are granted as follows:

Motor certificates qualifying the holders to serve as marine engineer officers in motor ships, being propelled by internal combustion engines, or in ships being propelled by gas turbines.

3.2 To qualify for the issue of an initial certificate of competency (marine engineer officer) (river trade) of any class in Hong Kong, a candidate must:

(a) have completed approved basic training courses in accordance with Section A-VI/1 of the STCW Code on:

(i) personal survival techniques;
(ii) fire prevention and fire-fighting;
(iii) elementary first aid;
(iv) personal safety and social responsibilities;

(b) have completed an approved proficiency in survival craft and rescue boats course or equivalent in accordance with Section A-VI/2 of the STCW Code;

(c) have completed an approved advanced fire-fighting course or equivalent in accordance with Section A-VI/3 of the STCW Code; and

(d) have completed an approved medical first aid course or equivalent in accordance with Section A-VI/4.

3.3 **Certificate of Competency (Marine Engineer Officer) (River Trade) Class 3**

3.3.1 To qualify for the issue of a certificate of competency (marine engineer officer) (river trade) Class 3, a candidate must in addition to meet the requirement of paragraph 3.2 of this chapter

(a) be of not less than 18 years of age;

(b) have received basic education to the standard of Secondary 3 or equivalent;

(c) (i) have completed combined workshop skills training of not less than ten (10) days and an approved sea service of not less than six (6) months as engineer cadet, assistant engineer or junior engineer after completion an

approved two-year technical education and practical training that are relevant to the duties of a marine engineer, or

(ii) have served at least two (2) years as motorman, oiler or assistant fitter in a seagoing ship; or

(iii) hold a Local Certificate of Competency as Engine Operator Grade 1 Certificate or an equivalent local certificate of competency; or

(iv) have completed an approved training programme of not less three (3) months including engineering knowledge and workshop skills; and approved sea service of not less than twenty-four (24) months as an assistant engineer, junior engineer or fitter; or thirty (30) months as a General Purpose rating;

(d) pass the examination set out in Part III of this Chapter; and

(e) hold a valid medical fitness certificate or equivalent.

3.4 Certificate of Competency (Marine Engineer Officer) (River Trade) Class 2

3.4.1 To qualify for the issue of a Certificate of Competency (Marine Engineer Officer) (River Trade) Class 2 a candidate must:

(a) hold a Certificate of Competency (Marine Engineer Officer) (River Trade) Class 3 or a Certificate of Competency (Marine Engineer Officer) Class 3, or an equivalent certificate;

(b) complete a period of approved sea service of at least 12 months as a watchkeeping officer in a vessel powered by engines of over 750 kW;

(c) pass the examination set out in Part III of this Chapter; and

(d) hold a valid medical fitness certificate or equivalent.

3.5 Certificate of Competency (Marine Engineer Officer)(River Trade) Class 1

3.5.1 To qualify for the issue of a Certificate of Competency (Marine Engineer Officer)(River Trade) Class 1 a candidate must:

(a) (i) complete a period of approved sea service of at least 12 months as a watchkeeping officer in a vessel powered by engines of over 3,000 kW whilst holding a certificate of competency (marine engineer officer)(river trade) class 2; or a certificate of competency (marine engineer officer) class 2, or an equivalent certificate; or

(ii) complete a period of approved sea service of at least 24 months as a watchkeeping officer in a vessel powered by engines over 750 kW but less than 3,000 kW whilst holding a certificate of competency (marine engineer officer)(river trade) class 2; or a certificate of competency (marine engineer officer) class 2, or an equivalent certificate; or

(iii) complete pro rata approved sea service in accordance with (i) and (ii) above; and

(b) pass the examination set out in Part III of this Chapter; and

(c) hold a valid medical fitness certificate or equivalent.

PART II

GENERAL REQUIREMENTS

3.6 Approved sea Service

3.6.1 Approved sea service, unless otherwise specified, must be served in engine department on vessels procced to sea within river trade limits and / or seagoing area with engines of over 120 kW excluding fishing vessels and pleasure craft.

3.6.2 Approved sea service will be reckoned from the date of engagement to the date of discharge from a vessel under crew agreement. When there are no articles of agreement, the total time during which the candidate has been employed on a vessel will be accepted. Subject to verification, as and when necessary, certificates of discharge will be accepted as proof of sea service. River trade service must be attested/certified by the Technical / Engineering / Marine Manager or other representative of the Owners, or another organization or person assumed the responsibility for the operation of the vessel from the owner.

3.6.3 When a part or whole of the approved sea service for Certificate of Competency (Marine Engineer Officer)(River Trade) Class 1 or 2 has been performed in seagoing vessels, such service will be accepted at twice the rate applicable to coastal-going ships.

3.6.4 Calculations of voyage length for the purpose of establishing sea service should be made in calendar months and days. When it happens that a candidate 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 thirty (30) to give months, and residual days. The months should then be added as the total months.

3.6.5 Notwithstanding any provisions relating to approved sea service for certificates of competency (marine engineer officer) (river trade), any candidate who has qualified for entry to the examinations for any class of seagoing certificate of competency specified in the relevant seagoing determinations shall also be deemed to have met the requirements for examination for the corresponding class of certificate of competency (marine engineer officer) (river trade). For no trading service and local service in Hong Kong, same consideration in the seagoing determinations shall be taken.

3.7 Endorsements

3.7.1 Suitable endorsement examinations will be conducted for the operation of a steam vessel. Syllabuses will be developed for these endorsements in the event of a vessel so equipped being engaged in the coastal-going ships service.

3.8 Certificates of Competency (Marine Engineer Officer) (River Trade)

3.8.1 Any reference to a Certificate of Competency (Marine Engineer Officer) (River Trade) of any class in this Chapter relates to a certificate for a motor ship, ship being propelled by internal combustion engines or gas turbines.

3.9 **Exemption for Certificate of Competency (Marine Engineer Officer)(River Trade) Class 2 and Class 1 Examinations**

3.9.1 The Director may grant exemption from the river trade examinations on a subject for subject basis to candidates who have completed recognized engineering courses.

3.10 Holder of seagoing Certificate of Competency serving on coastal-going ships

3.10.1 candidates shall apply for and obtain river trade class endorsement prior to serving on coastal-going ships operating within the river trade area. A company letter proving the candidate is employed by a coastal-going ships operator shall be produced as an evidence for the application.

PART III

EXAMINATIONS AND EXEMPTIONS

EXAMINATIONS

3.11 **Certificate of Competency (Marine Engineer Officer)(River Trade) Class 3**

3.11.1 The examination for a Certificate of Competency (Marine Engineer Officer) (River Trade) Class 3 will be oral only.

3.12 **Certificate of Competency (Marine Engineer Officer)(River Trade) Class 2**

3.12.1 The examination for Certificate of Competency (Marine Engineer Officer) (River Trade) Class 2 consists of two parts as follows:

Written examination:		Duration
a)	Engineering Theory	2 hours
b)	Engineering Knowledge (1)	2 hours
c)	Engineering Knowledge (2)	2 hours

Oral examination:

a)	Engineering Knowledge Safety of Life and Ship	1 hour (approximately)

3.13 **Certificate of Competency (Marine Engineer Officer)(River Trade) Class 1**

3.13.1 The examination for Certificate of Competency (Marine Engineer Officer) (River Trade) Class 1 consists of two parts as follows:

Written examination:		Duration
a)	Engineering Theory I	3 hours
b)	Engineering Theory II	3 hours
c)	Engineering Knowledge (1)	3 hours
d)	Engineering Knowledge (2)	3 hours

Oral examination:

a)	Engineering Knowledge Safety of Life and Ship	1 hour (approximately)

3.14 **Pass Marks**

3.14.1 Candidates will be required to obtain not less than fifty percent marks in each subject attempted in the written examinations.

EXEMPTIONS

3.15 **General**

3.15.1 Candidate who has completed an approved course in Hong Kong and passed the terminal examinations leading to the award of the qualifications specified in paragraph 3.16 and to the standard required by the Director, may be eligible exemptions from the written examinations on a subject for subject basis except Engineering Knowledge.

3.16 **Exemption from Written Examinations**

3.16.1 Candidates for a Certificate of Competency (Marine Engineer Officer) (River Trade) Class 2 who have satisfactorily completed the approved Higher Diploma in mechanical (with marine selective) course at the Institute of Vocational Education (IVE) and who have been successful in the final examinations may be granted exemption from the examination paper "Engineering Theory".

3.16.2 Candidates for a Certificate of Competency (Marine Engineer Officer) (River Trade) Class 1 who have satisfactorily completed the approved Higher Diploma in mechanical (with marine selective) course at the Institute of Vocational Education (IVE) and who have been successful in the final examinations may be granted exemption from the examination papers "Engineering Theory I" and "Engineering Theory II".

3.16.3 Candidates who are the holder of seagoing certificate of competency issued / recognized by the Director and serving on coastal-going ships may be unable to revalidate their seagoing certificates of competency in accordance with Convention requirements for seagoing services. These candidates can apply for the exemption from undergoing the appropriate examination specified in Part I for the grant of the same class of river trade certificate of competency before the expiry of their seagoing certificate of competency provided that the candidates have met other requirements specified in Part I, have served not less than twelve (12) months on coastal-going ships in the preceding five (5) years and have a company letter stating their posts, responsibilities and duration of their services. Applicants for exemption will be required to pay the appropriate examination fees (same as the fee of full examination for the same class certificate of competency (river trade)) before verify their eligibility for exemption.

PART IV

REVALIDATION OF CERTIFICATES

Introduction

3.17 All certificates of competency (marine engineer officer) (river trade) will fall due for revalidation on the expiry date stated on the certificate. Once a certificate has been revalidated it will thereafter fall due for further revalidation upon expiry of the extended validity.

Conditions to be satisfied for revalidation

3.18 A certificate holder who wishes to revalidate his certificate must pay the prescribed fee and must:

(a) meet the medical fitness requirements by producing a valid medical fitness certificate, or equivalent;

(b) (i) have served as an engineer officer in any coastal-going ship operating within river trade limits, other than a pleasure craft or a fishing vessel, for at least:
(i-1) 12 months during the preceding 5 years; or
(i-2) 3 months in total during the preceding 6 months immediately prior to revalidating; or

(ii) have satisfactorily completed an approved shore based updating course; or

(iii) have completed not less than three (3) months sea service on vessels having a registered power of 350 kW or more in a supernumerary capacity or in lower ranks than that for which the certificate held is valid immediately prior to taking up the rank for which it is valid; or

(iv) have performed other functions relating to the duties which ensure an adequate updating of marine engineering knowledge. A list of appropriate functions is contained in paragraph 3.19; and

(c) (i) have completed, within five year prior to the expiry date of the CoC, an approved refresher training course on basic training, survival craft and rescue boats, and advanced fire-fighting; or to present a valid Certificate of Proficiency in Basic Training, a valid Certificate of Proficiency in Survival Craft and Rescue Boats other than Fast Recuse Boats, and a valid Certificate of Proficiency in Advanced Fire-Fighting, or passed an assessment pursuant to the requirements in Section A-VI/1 paragraph 3, A-VI/2 paragraph 5, and A-VI/3 paragraph 5 of STCW Code, as amended; or

(ii) According the HSCCC Paper No.: 1/2013 (https://www.mardep.gov.hk/filemanager/en/share/aboutus/pdf/hsccc/hsccc_p012013.pdf), the above STCW 5-yearly refresher course requirements for seagoing seafarers be waived for the river trade seafarers, provided that the following conditions are met with:

- For any river trade rating: has HSC shipboard service record for at least an accumulative period of 12 months during every 5-year period counting from the issuance date of the rating's most recent valid safety training record;

- For any officer holding river trade certificate of competency: holds a valid TRC (Master, C/O, NVO, or Engineer).

River trade seafarers who fail to provide evidence of meeting sub-paragraph (c) (ii), need to complete a refresher course, or hold valid Certificates of Proficiency described in above.

3.19 If the holder of certificate is unable to demonstrate the above sea service he/she may revalidate his/her Certificate of competency (marine engineer officer) (river trade) by demonstrating at least 30 months' employment in an occupation the Director considers equivalent to sea service, in the 5 years immediately prior to revalidating his/her Certificate of competency (marine engineer officer) (river trade). Occupations will be considered equivalent if applicant can demonstrate proficiency by virtue of having performed functions relating to the duties appropriate to Certificate of competency (marine engineer officer) (river trade) held. A list of occupations which will be favourably considered is given below:

- Marine Surveyors (including Marine Department Surveyors, Assistant Surveyors of Ships, Examiners, Shipping Safety Officers and Ship Inspectors);

- Technical, Engineering and Marine Superintendents;

- Ship Repair Managers;

- Marine Engineering Lecturers / Instructors.

3.20 The list of alternative occupations in paragraph 3.19 is not exhaustive and application for revalidation from certificate holders who have been engaged in other activities will be considered by the Director on their merits. Original company letter(s) demonstrating thirty (30) months in an acceptable occupation must detail applicant's role(s), responsibilities and dates of service. He/she must demonstrate that he/she has performed functions relating to the duties appropriate to the class or grade of certificate his/her hold. Applicants must also have completed the training courses in paragraph 3.18 (c).

3.21 Additional information concerning the procedure for revalidation may be obtained from the River Trade and Local Examination Section.

3.22 Applications for revalidation from certificate holders abroad may be made by post or email to the River Trade and Local Examination Section and should include all

evidence and supporting documents showing qualifications obtained as per stipulated in paragraph 3.18 and 3.19, i.e.:

(a) Certificate of competency
(b) Medical fitness certificate
(c) Fee
(d) Records of sea service or shore employment as appropriate
(e) Evidence of qualifications obtained as per item (c) of paragraph 3.18 for the maintenance of proficiency.

Revalidation of expired Certificate of Competency

3.23 In addition to fulfilling the prerequisite requirement laid down in paragraph 3.2 of Chapter 3 and presenting a valid medical fitness certificate, the following conditions shall be met as appropriate.

3.24 Holders of a certificate of competency (marine engineer officer) (river trade) expired within the last 10 years shall pass an approved oral examination relating to the development and requirements of international maritime conventions before revalidation processing. After passed an approved oral examination, the expired Certificate of competency may be revalidated as above procedures in paragraph 3.1.8 and 3.1.9..

3.25 Holders of a certificate of competency expired (river trade) for more than 10 years but within 20 years shall pass a Class 3 oral examination before a temporary Class 3 certificate of competency (marine engineer officer) (river trade) is issued for a period of six (6) months. The holders of temporary certificate of competency (marine engineer officer) (river trade) have to complete a 3-month river trade service and passed an oral examination for the original class of their certificate of competency (marine engineer officer) (river trade) before the same class of certificate of competency (marine engineer officer) (river trade) is issued.

3.26 Holders of a certificate of competency (marine engineer officer) (river trade) in any class expired for over 20 years shall pass all the written examination for engineering knowledges and an oral examination before the original class of certificate of competency (marine engineer officer) (river trade) is issued.

CHAPTER 4

RIVER TRADE CERTIFICATES OF COMPETENCY

EXAMINATION SYLLABUSES

PART I

CERTIFICATE OF COMPETENCY (MARINE ENGINEER OFFICER) (RIVER TRADE) CLASS 3

4.1 **Examination**

Oral examination on Engineering Knowledge	))	Approximately one hour.

4.2 **Engineering Knowledge**

In the oral examination, the candidate is required to demonstrate he has the ability to undertake, at the operational level, the tasks, duties and responsibility of a marine engineer officer in charge of an engineering watch on board a coastal-going ships which involve the following functions and competencies:

Function 1: Marine engineering at the operational level

Competence (i): Maintain a safe engineering watch

Content of examination	Criteria for satisfactory examination
Principles in keeping an engineering watch	
i. Duties associated with taking over and accepting charge of the engine room.	Understanding the principles and procedures in conducting, handover and relief of charge of the engine room. Understanding the special precautions during the charge to be taken under different conditions and in different sea states. Understanding the proper record to be maintained for the movements and activities relating to the ship's engineering systems.
ii. Routine duties undertaken during a voyage.	
iii. Maintenance of the machinery space log book and the significance of the readings taken.	
iv. Duties associated with handing over to the following engineer.	
Safety and emergency procedures	
Safety and emergency procedure, changeover of remote/automatic to local control of all systems.	Understanding the procedures to isolate, bypass and take emergency control of machinery.

Safety Precautions Safety precaution to be observed during a voyage and immediate actions to be taken in the event of fire or accident with particular reference to oil systems.	Understanding the action that would be necessary in case of accident involving oil systems and damages resulting from equipment breakdown, fire, flooding, rupture, collision or other causes in order to contain the effects.

Competence (ii): Use Chinese or English in oral form

Content of examination	Criteria for satisfactory examination
Knowledge of Chinese or English language Communication ability in Chinese or English.	Communication in Chinese or English is clear and understood.

Competence (iii): Operate main and auxiliary machinery and associated control systems

Content of examination	Criteria for satisfactory examination
Motorship **Main and auxiliary machinery**	
i. Preparation of main diesel propulsion machinery and preparation of auxiliary machinery for operation.	Proficiency in planning and carrying out operations for preparation of main and auxiliary machinery in accordance with established rules and procedures to ensure safety of operations and avoid pollution of the marine environment. Proficiency in identification of deviations from norm.
ii. Fuel and lubricating oil systems for marine diesel plant. Properties and handling of oils.	Understanding properties, storage and handling of fuel and lubricating oils.
iii. Location of common faults in diesel propulsion machinery and auxiliary machinery in engine room and steering gear room and action necessary to prevent damage.	Proficiency in identification of the causes of malfunction and actions to ensure the overall safety of the ship and the plant having regard to the prevailing circumstances and conditions.

Competence (iv): Operate pumping systems and associated control systems

Content of examination	Criteria for satisfactory examination
Pumping systems	
i. Routine pumping operations. ii. Operation of bilge, ballast and cargo pumping systems.	Proficiency in planning and carrying out pumping operations in accordance with established rules and procedures to ensure safety of operations and avoid pollution of marine environment.

Function 2: Maintenance and repair at the operational level

Competence: Maintain marine engineering systems including control systems

Content of examination	Criteria for satisfactory examination
Marine systems Basic mechanical knowledge and skills of marine systems. **Safety and emergency procedures** Safe isolation of electrical and all plant and equipment before personnel are permitted to work on such plant or equipment. **Maintenance and repair** Maintenance and repair to main propulsion plant, auxiliary machinery including steering gear, deck machinery and survival equipment.	Understanding basic knowledge and skills of engineering systems including control systems. Proficiency in isolation, dismantling and re-assembly of plant and equipment in accordance with accepted practices and procedures. Understanding actions to restore plant and equipment by methods most suitable and appropriate to the prevailing circumstances and conditions.

Function 3: Electrical, electronic and control engineering at the operational level

Competence: Operate alternators, generators and control systems

Content of examination	Criteria for satisfactory examination
Generating plant i. Basic electrical knowledge and skills of generating plant and the associated electrical distribution system and gears. ii. Preparation, starting, coupling and change over alternators or generators. iii. Location of common faults in electrical and electronic systems and actions to prevent damage. **Control systems** Location of common faults in control system and action to prevent damage.	Proficiency in planning and carrying out operations for generating plant and control systems in accordance with established rules and procedures to ensure safety of operations.

Function 4: Controlling the operation of the ship and care for persons on board at the operational level

Competence (i): Ensure compliance with pollution prevention requirements

Content of examination	Criteria for satisfactory examination
Prevention of pollution i. Knowledge of the precautions to be taken to prevent pollution of the marine environment. ii. Anti-pollution procedures and all associated equipment including oily water separator.	Proficiency in procedures for monitoring shipboard operations and ensuring compliance with pollution prevention requirements.

Competence (ii): Maintain seaworthiness of the ship

Content of examination	Criteria for satisfactory examination
Ship stability i. Working knowledge and application of stability, trim and stress tables, diagrams and stress calculating equipment. ii. Fundamentals of watertight integrity. iii. Fundamental actions to be taken in the event of partial loss of intact buoyancy. **Ship construction** General knowledge of the principal structural members of a ship and the proper names for the various parts.	Understanding the stability conditions complying with intact stability criteria under all conditions of loading. Understanding actions to ensure and maintain the watertight integrity of the ship in accordance with accepted practice.

Competence (iii): Monitor compliance with legislative requirements

Content of examination	Criteria for satisfactory examination
IMO conventions Working knowledge of the relevant IMO conventions concerning safety of life at sea and protection of marine environment.	A command of legislative requirements relating to safety of life at sea and protection of marine environment.

PART II

CERTIFICATE OF COMPETENCY (MARINE ENGINEER OFFICER) (RIVER TRADE) CLASS 2

The syllabuses for the written examination papers of Certificate of Competency (Marine Engineer Officer)(River Trade) Class 2 are listed in the following paragraph 4.3 to 4.6 of this Part

4.3 Engineering Theory

Function 1: Marine engineering at the management level

Competence: Plan and schedule operations

Criteria for satisfactory examination:
i. Understanding the basic concepts of thermodynamics and its applications. Understanding the design parameters on thermodynamics and heat transmission for power installation to suit the planning and preparation of operations.
ii. Understanding the basic knowledge on mechanics and fluid mechanics, and its applications. Understanding the design parameters on mechanics for power installation to suit the planning and preparation of operations.

4.3.1 Heat

Temperature and its measurement. Significance of absolute temperature. Heat as energy. Conservation of energy applied to heat and work. Fuels. Calorific value. Expansion and contraction of solids, liquids and gases. Change of phase. Properties of refrigerant fluids. Compression and expansion of gases. Gas Laws. Boyle's Law. Charles' Law. Characteristic gas equation. Elementary qualitative treatment of heat transfer by conduction, convection and radiation. Effect of insulation. Internal combustion engines. Indicator diagram, power developed, fuel consumption. Principles of combustion. Insufficient, minimum and excess air.

4.3.2 Applied Mechanics

The vector representation of forces. Triangle of forces.

Resultant and equilibrant of a system of concurrent co-planar forces.

The principle of moments, application to simply supported beams and cantilevers. Centre of area. Centre of gravity.

Displacement, time, speed, linear velocity and acceleration. Force, moment of force, torque, work, energy, power.

Simple machines. Velocity ratio, mechanical advantage, efficiency.

Friction, Laws for dry surfaces, coefficient of friction (horizontal plane only). Direct stress and strain. Hooke's Law. Modulus of elasticity, elastic limit, UTS, yield stress, limit of proportionality, safety factor, shear stress.

Relative density, variation of fluid pressure with depth. Archimedes principles. Elementary treatment of transverse stability. Transverse movement of masses across deck. Free surface effect.

4.3.3 Mathematical Calculations

Extraction and cancellation of common factor, significant figures, degree of accuracy. Averages, percentages, ratio, proportions, use of tables, square toots, reciprocals, use of logarithms for multiplication, division, powers and roots. Surface areas and volumes of cylinders, spheres, cones, frustums and cubes.

Function 2: Electrical, electronic and control engineering at the management level

Competence: Operate electrical and electronic control equipment

Criteria for satisfactory examination:
Understanding the basic electrical and electronic principles for the operation and control of electrical machines and power electronic systems.

4.3.4 Electricity

Simple electric circuits. Effects of electric current - chemical, magnetic and thermal. Ohm's law. Series and parallel circuits. Electromotive force, voltage. Units of current, resistance, voltage, energy. Secondary cells (acid and alkali), construction, capacity - ampere hour. Distribution of current in circuits. Resistance of conductor, variation with dimensions, material, temperature. Temperature coefficient of resistance. Motor and generator principle.

4.4 Engineering Knowledge (1)

Function 1: Marine engineering at the management level

Competence (i): Start up and shut down main propulsion and auxiliary machinery including association systems

Content of examination	Criteria for satisfactory examination
Ship power installation and refrigeration Operating principles of ship power installations (diesel, steam and gas turbine) and refrigeration.	Adequate knowledge on the planning and preparation of operations to suit the design parameters of the power installation and to the requirements of the voyage.
Fuels and lubricants Physical and chemical properties of fuels and lubricants; general requirements for their	Adequate knowledge on types, specifications, properties, usage, preparation and treatment of fuel and lubricating oils.

storage, processing and safe handling on board vessels. **Technology of materials** i. Properties and characteristics of metals, materials, liquids, gases and vapours used in machinery on board ships. ii. Manufacture methods, treatment, and processes used for marine machinery.	Understanding the methods of making available fuels and lubricants. Adequate knowledge on the technical specifications, and application of engineering materials and substances for shipboard use. Proficiency in the methodology used for production and material repair for marine machinery.

Competence (ii): Maintain safety of engine equipment, systems and services

Content of examination	Criteria for satisfactory examination
Operation and maintenance of auxiliary machinery i. Operation and maintenance of auxiliary machinery, e.g. generators, air compressors, heat exchangers, pumps, pumping systems, oily water separators. ii. Constructional details, principles involved and operation of steering gear, refrigeration machinery. iii. Principles involved, operation and construction of thrust blocks, shafting bearings, stern tubes, propellers, ship-side fittings. **Control systems** Principles of operation, testing, operational fault rectification of automatic control and alarm systems. **Deck machinery** Principles involved with the construction, operation and maintenance of deck machinery.	Adequate knowledge on the arrangements needed for ensuring the safe operation and maintaining the condition of auxiliary machinery including control systems and machinery on deck to suit all modes of operation.

Competence (iii): Manage fuel and ballast operations

Content of examination	Criteria for satisfactory examination
Fuel and ballast pumping systems General requirements concerning fuel and ballast pumping systems with particular reference to prevention of marine pollution.	Adequate knowledge on fuel and ballast operations including planning, preparation, procedures, monitoring and safety precautions to meet operational requirements and prevent pollution of environment.

Competence (iv): Use internal communication systems

Content of examination	Criteria for satisfactory examination
Internal communication systems Principles and use of all internal communication systems on board.	Adequate knowledge on the types, system details, function and use of all internal communication equipment or arrangement for effective transmission and reception of messages.

Function 2: Electrical, electronic and control engineering at the management level

Competence: Test, detect faults and maintain and restore electrical, electronic and control equipment to operating condition

Content of examination	Criteria for satisfactory examination
Electrical and electronic control equipment Safe and efficient operation of electrical machines, systems and electronic control equipment including fault diagnostics.	Proficiency in planning and procedures to carry out maintenance activities in accordance with technical, legislative, safety and procedural specification. Proficiency in identifying the effects of malfunctions of electrical and electronic control equipment on associated plant.

Function 3: Maintenance and repair at the management level

Competence (i): Organize safe maintenance and repair procedures

Content of examination	Criteria for satisfactory examination
Marine engineering practice Maintenance of operating records, the planning of maintenance schedules and the procurement of stores and spare parts.	Proficiency in planning and procedures to carry out maintenance activities in accordance with technical, legislative, safety and procedural specifications.
Maintenance and repair procedures Organizing and carrying out safe maintenance and repair procedures.	Adequate knowledge on appropriate plans, for maintenance and repair. Understanding action taken leading to the restoration of plant by the most suitable method.

Competence (ii): Detect and identify the cause of machinery malfunctions and correct faults

Content of examination	Criteria for satisfactory examination

Marine malfunction Detection of machinery malfunction, location of faults and action to prevent damage.	Proficiency on the methods based on recommended practices and procedures for comparing actual operating conditions. Proficiency in the principles for taking action and decisions to deal with machinery malfunction in accordance with recommended operating specifications and limitation.

Competence (iii): Ensure safe working practices

Content of examination	Criteria for satisfactory examination
Safe working practice i. Safe working practices in machinery operation and maintenance. ii. Safe working practices to be observed for entry into confined or enclosed spaces.	Adequate knowledge on working practices with reference to legislative requirements, code of practice, permits to work and environmental concerns to ensure safety and health of those living and working on board ship.

Function 4: Controlling the operation of ship and care for persons on board at the management level

Competence (i): Control trim, stability and stress

Content of examination	Criteria for satisfactory examination
Effects on trim and stability due to ship damage i. Knowledge of the effect on trim and stability of a ship in the event of damage to and consequent flooding of a compartment and counter measures to be taken. ii. Knowledge of IMO recommendations concerning ship stability.	Understanding the criteria for maintaining stability and stress conditions within safety limits at all times.

Competence (ii): Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea and protection of the marine environment

Content of examination	Criteria for satisfactory examination
Knowledge of relevant international maritime laws embodied in international agreements and conventions i. Certificates and other documents required to be carried on board vessels by international conventions, how they	Thorough understanding of the legal responsibilities at the management level and procedures for monitoring operations and

may be obtained and the period of their legal validity. ii. responsibilities under the relevant requirements of the International Convention on Load Lines, International Convention for the Safety of Life at Sea, International Convention for the Prevention of Pollution from ships. iii. maritime declaration of health and the requirements of the International Health Regulations. iv. responsibilities under international instruments affecting the safety of the ship, passengers, crew or cargo. v. methods and aids to prevent pollution of the environment by vessels. vi. knowledge of national legislation for implementing international agreements and conventions.	maintenance in compliance with legislative requirements. Proficiency in identification of potential non-compliance. Adequate knowledge on requirements for renewal and extension of certificates to ensure continued validity of survey items and equipment.

Competence (iii): Maintain safety and security of the vessel, crew and passengers and the operational condition of life-saving, fire-fighting and other safety systems

Content of examination	Criteria for satisfactory examination
Life-saving appliance regulations A thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea).	Adequate knowledge on the function, use and procedures for maintaining in operational state of the life-saving appliances, fire-fighting appliances and other safety systems.
Fire and abandon ship drills Organization of fire and abandon ship drills.	
Maintenance of safety systems Maintenance of operational conditions of life-saving, fire-fighting and other safety systems.	
Protection of persons Actions to be taken to protect and safeguard all persons on board in emergencies.	Proficiency in procedures for handling emergency to salve the ship and persons on board following fire, explosion, collision or grounding.
Emergency Actions Actions to limit damage and salve the ship following fire, explosion, collision or grounding.	

Competence (iv): Develop emergency and damage control plans and handle emergency situations

Content of examination	Criteria for satisfactory examination
Ship construction and damage control Shipbuilding materials. Watertight integrity of hull and compartments. Damage control arrangement.	Proficiency in plans for emergency situations and the emergency procedures.
Fire prevention, detection and extinction i. Fire prevention, detection, extinction. Principles of operation, application and maintenance of fire extinguishers, respirators, safety lamps. General requirements of fire pumping systems. Fixed fire detection and extinguishing arrangements for accommodation, cargo and machinery spaces.	Proficiency in practices and requirements for maintaining fire-fighting appliances to operational conditions.
Life-saving appliances Function and use of life-saving appliances.	Proficiency in practices and requirements for maintaining life-saving appliances to operational conditions.

Competence (v): Organize and manage the crew

Content of examination	Criteria for satisfactory examination
Personal management, organization A knowledge of personnel management and organization on board vessels.	Adequate personnel management concept for managing crew to execute duties and achieve performance in accordance with the competency standard.
International maritime conventions A knowledge of international maritime conventions and recommendations, and related national legislation.	Adequate knowledge on international maritime conventions.

4.5 **Engineering Knowledge (2)**

Function 1: Marine engineering at management level

Competence (i): Start up and shut down main propulsion and auxiliary machinery including associated systems

Content of examination	Criteria for satisfactory examination
Fuels and lubricants Physical and chemical properties of fuel oils and lubricating oils; general requirements	Adequate knowledge on types, specifications, properties, usage, preparation and treatment of fuel and lubricating oils.

concerning fuel oil and lubricating oil systems.	Understanding the methods of making available fuels and lubricants.

Competence (ii): Operate, monitor and evaluate engine performance and capacity

Content of examination	Criteria for satisfactory examination
Operation and maintenance of compression ignition engines	
i. Working principles and constructional details of compression ignition engines, turbo-chargers, running gear, chains.	Adequate knowledge on the design features, constructional details, installation requirements and maintenance of compression ignition engines.
ii. Safe and efficient operation and maintenance of compression ignition engines. The determination, recognition and rectification of irregularity in the performance of diesel machinery. Indicator cards.	Adequate knowledge on operating the engine to achieve performance level to meet the operational requirements and in accordance with technical specifications. Proficiency on the methods of measuring load capacity of engines in accordance with technical specifications.
iii. Fuel injection system. Reversing mechanism. Starting system. Gearing, clutches.	Adequate knowledge on operating and maintaining ancillary equipment to achieve performance level to meet the operational requirements and in accordance with technical specifications.
Marine gas turbines	
Operation and maintenance of marine gas turbines.	Proficiency in operational and maintenance requirements of marine gas turbines.

Function 2: Electrical, electronic and control engineering at the management level

Competence: Operate electrical and electronic control equipment

Content of examination	Criteria for satisfactory examination
Automation, instrumentation and control systems	
i. Main propulsive machinery control systems, automation and instrumentation.	Adequate knowledge on instrumentation and proficiency in operation of control equipment and systems to the designed performance level.
ii. Bridge control.	

Function 3: Maintenance and repair at the management level

Competence: Organize safe maintenance and repair procedures

Content of examination	Criteria for satisfactory examination
Marine engineering practice i. Principles of preventive, corrective and condition monitoring maintenance strategy and repair technology for marine engine and machinery. ii. Common recurrent failures and causes on marine engine.	Proficiency in planning and procedures to carry out maintenance activities in accordance with technical, legislative, safety and procedural specifications.
Safe maintenance and repair procedures Methods of dealing with wear and tear of engines. Alignment of machinery components. Correction of defects. Temporary and permanent repairs in the event of breakdown. Overhauling of machinery. Safe working practice.	Adequate knowledge on appropriate plans, specifications, materials and equipment to be made available for maintenance and repair. Understand action taken leading to the restoration of plant by the most suitable method.

4.6 Oral Examination

The oral examination will determine if the candidate has gained sufficient knowledge and skills to fulfil the duties of a second engineer officer on board a coastal-going ships. Questions will be taken selectively through the range of topics detailed in the Engineering Knowledge syllabuses.

The examiner may also ask questions on items contained in other syllabuses to the extent necessary to test the candidate's knowledge in the operational and safety aspects relevant to the second engineer officer's duties.

PART III

CERTIFICATE OF COMPETENCY (MARINE ENGINEER OFFICER) (RIVER TRADE) CLASS 1

The syllabuses for the written examination papers of Certificate of Competency (Marine Engineer Officer)(River Trade) Class 1 are listed in the following paragraph 4.7 to 4.12 of this Part.

4.7 Engineering Theory I (Heat Engines and Applied Mechanics)

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

Competence: **Plan and schedule operations**

Criteria for satisfactory examination:

i. Understanding the basic concepts of thermodynamics and its application to design and engineering processes. Understanding the design parameters on thermodynamics and heat transmission for power installation to suit the planning and preparation of operations.

ii. Adequate knowledge on statics, mechanics of solids, kinematics, kinetics, fluid mechanics and its applications to design engineering components and machines and engineering processes. Understanding the design parameters on mechanics and hydromechanics for power installation to suit the planning and preparation of operations.

4.7.1 Heat Engines

Heat. Temperature and its measurement. Absolute temperature. Specific heat. Problems involving change of phase. Linear, superficial and volumetric expansion due to temperature changes. Coefficients and the relationship between them.

Basic Thermodynamic Principles. The First Law of Thermodynamics. Flow and non-flow process.

Heat Transfer. Qualitative treatment of heat transfer by conduction, convection and radiation. Laws of conduction and thermal conductance and their application to problems.

Gases. Boyle's and Charles' Laws for perfect gases. Characteristic equation. Constant 'R' and its use in simple problems. Isothermal, adiabatic and polytrophic processes. Relationships between pressure, temperature and volume. Specific heat Cp and Cv and the relationship between them.

Ideal Gas Cycles. Constant volume cycle. Diesel cycle. Air standard efficiency.

I.C. Engines. Elementary principles and cycles of operation. Actual indicator diagrams. Mean effective pressure. Work done, power developed, indicated and brake

thermal efficiencies, mechanical efficiency, overall efficiency. Fuel consumption. Heat balance.

Air Compressors. Elementary principles and cycles of operation. Calculation of work done. Indicator diagrams.

Combustion. Solid and liquid fuels. Calorific value. Chemical equations for complete combustion. Theoretical minimum air required. Excess air.

Refrigeration. Vapour-compression cycle. Refrigerating effect. Cooling load. Use of tables of properties of refrigerants. Coefficient of performance.

4.7.2 Applied Mechanics

Statics. Force as a vector. Triangle and polygon of forces. Moment of a force. Moments of areas and volumes. Centroids and centre of gravity (limited to geometrical shapes). Conditions of equilibrium of solids. Necessary force applied parallel to an inclined plane to pull body up or down the plane or to hold it stationary (including effect of friction). Work done at uniform speed up the plane.

Friction. Coefficient of friction. Friction angle. Energy and power lost due to friction in simple bearings.

Kinematics. Linear motion. Graphs and equation for displacement, speed, velocity and uniform acceleration. Velocity as a vector. Relative velocities in one plane.

Dynamics. Work and power. Energy. Potential energy. Kinetic energy of translation. Newton's laws of motion. Conservation of momentum. Centrifugal force and its application to conical pendulum, unloaded governor, curved tracks and machine parts. Stress in thin rim due to centrifugal action.

Machines. Simple lifting machine. Velocity ratio, mechanical advantage and efficiency of machines, e.g. wheel and axle, rope pulley blocks, screw jacks, worm-driven chain blocks. Reduction gearing.

Stress and Strain. Direct stress and strain. Modulus of elasticity. Shear stress and strain. Modulus of rigidity. Factor of safety.

Beams. Shearing force and bending moment diagrams for cantilevers and simply supported beams. Stress due to bending.

Torsion. Strength and stiffness of solid and hollow shafts. Stress due to torsion. Power transmitted by shafts and coupling bolts.

Thin Shells. Circumferential and longitudinal stress in thin cylindrical shell subject to internal pressure.

Hydrostatics. Equilibrium of floating bodies. Variation of fluid pressure with depth. Total force due to liquid pressure on immersed plane surfaces horizontal or vertical. Centre of pressure on a rectangular vertical plane surface or triangular plane surface, both with one edge parallel to the surface of the liquid.

Hydraulics. Full bore flow of liquid through pipes under constant head. Flow through office. Coefficient of velocity, contraction of area and discharge.

4.8 Engineering Theory II (Electrotechnology and Naval Architecture)

Function 1: Electrical, electronic and control engineering at the management level

Competence: Operate electrical and electronic control equipment

Criteria for satisfactory examination:
Understanding the basic electrical and electronic principles for the design, operation, maintenance and control of electrical machines and power electronic systems.

4.8.1 Electro technology

The Electric Circuit. Units - ampere, ohm, volt. Difference between electromotive force and potential difference. Ohm's Law. Kirchoff's Laws. Simple series and parallel circuits involving e.m.f., current, resistances. Power and energy. Specific resistance. Temperature coefficient of resistance. Conductor resistance, effect of length, area, material and temperature, d.c. 2-wire distribution system. Types of insulation.

Electrolytic action and secondary cells. Uses of electrolysis. Secondary cells (acid or alkaline). Construction and principles. Maintenance, charging. Watt-hour and ampere-hour efficiencies.

Electromagnetism. Electromagnetic induction. Simple magnetic circuit. Simple magnetic theory. Faraday's and Lenz's Laws.

Electronics. Semi-conductors. Junction diodes, junction transistors and their operating characteristics. Simple transistor circuits. Photo-electric effect.

Alternating Current Theory. Simple continuous periodic waves: frequency, amplitude, instantaneous, maximum, r.m.s. and average values, form factor. Phase difference. The inductor. Inductance and its effect on the circuit. The capacitor. Capacitance and its effect on the circuit. Simple series and parallel circuits. Relationship between resistance, reactance and impedance. Simple treatment of power factor. Power in single phase a.c. circuit.

Instruments. Qualitative treatment of the principles and functions of a.c. and d.c. indicating instruments and relays. Uses of shunts and series resistances to increase the range. Rectifiers and transducers.

Distribution Systems. Systems and a.c. and d.c. shipboard installations. Protective devices such as fuses, circuit breakers, earth lamps. Cable material and installation. Connection of shore supply.

D.C. Machines. The principles, constructional details and protection of d.c. series, shunt and compound wound motors and generators. Self-excitation, e.m.f. and load voltage equations. Load characteristics. Methods of voltage control, paralleling procedures and load sharing for generators. Need for and types of starter. Speed and torque equations. Speed control of d.c. motors.

A.C. machines. Simple explanation of the principles, constructional details and protection of alternators, squirrel-cage induction motors and single phase transformers, parallel running and synchronizing theory.

Function 2: (a) Marine engineering at the management level
(b) Controlling the operation of ship and care for persons on board at the management level

Competence: (a) Plan and schedule operations
(b) Control trim, stability and stress

Criteria for satisfactory examination:
i. Adequate knowledge on the principles of Naval Architecture to solve problems concerning stability, power estimation and ship's strength. Understanding ship construction.
ii. Understanding the criteria for maintaining stability and stress conditions within safety limits at all times.

4.8.2 **Naval Architecture**

General. Displacement. Wetted surface. Block, mid-section, prismatic and water-plane area coefficient. Tonne per centimetre immersion. Application of Simpson's Rules to areas, moment of area, volumes and moment of volumes.

Draught and buoyancy. Effect of bilging midship compartment.

Transverse Stability. Centre of gravity. Centre of buoyancy. Metacentre. Shift of centre of gravity due to addition or removal of mass. Free surface effect.

Resistance and Propulsion. Frictional and residual resistances. Admiralty and fuel coefficients. Relation between speed of vessel and fuel consumption with constant displacement, assuming that resistance varies as $(\text{speed})^n$. Elementary treatment of propeller and simple problems on pitch, pitch ratio, apparent slip, real slip, wake, thrust and power.

Structural Strength. Simple problems on strength of structural members to resist liquid pressure. Loading due to head of liquid.

Ship Construction. Common terms used in the measurement of steel vessels, e.g. length between perpendiculars, breadth overall, moulded depth, draught and freeboard. Definitions of shipbuilding terms in general use. Descriptions and sketches of structural members in ordinary type of steel vessels. Watertight doors. Hatches. Rudders. Bow thrusters. Propellers. Watertight bulkheads. Double bottoms. Anchors and cables. Descriptive treatment of the effect of free surface of liquids on stability. Ventilation arrangements for holds and oil fuel tanks. Fore and aft peak tanks, double bottom and deep tank filling and pumping arrangements. Compartmental drainage. Levelling arrangements for damaged side compartments.

4.9 **Engineering Knowledge (1)**

The syllabus for this examination is the same as that for the Engineering Knowledge (1) examination of the Class 2 examination. However, the candidate will be expected to answer more in depth questions than the Class 2 examination, and from the perspective that would be expected of a candidate for assuming the duties of a Chief Engineer.

Function 1: Marine engineering at the management level

Competence (i): Start up and shut down main propulsion and auxiliary machinery including associated systems

Content of examination	Criteria for satisfactory examination
Ship power installation and refrigeration Operating principles of ship power installations (diesel, steam and gas turbine) and refrigeration.	Adequate knowledge on the planning and preparation of operations to suit the design parameters of the power installation and to the requirements of the voyage.
Fuels and lubricants Physical and chemical properties of fuels and lubricants; general requirements for their storage, processing and safe handling on board vessels.	Adequate knowledge on types, specifications, properties, usage, preparation and treatment of fuel and lubricating oils. Understanding the methods of making available fuels and lubricants.
Technology of materials i. Properties and characteristics of metals, materials, liquids, gases and vapours used in machinery on board vessels. ii. Manufacture methods, treatment, and processes used for marine machinery.	Adequate knowledge on the technical specifications, and application of engineering materials and substances for shipboard use. Proficiency in the methodology used for production and material repair for marine machinery.

Competence (ii): Maintain safety of engine equipment, systems and services

Content of examination	Criteria for satisfactory examination
Operation and maintenance of auxiliary machinery i. Operating and maintenance of auxiliary machinery, e.g. generators, air compressors, heat exchangers, pumps, pumping systems, oily water separators. ii. Constructional details, principles involved and operation of steering gear, refrigeration machinery. iii. Principles involved, operation and construction of thrust blocks, shaft	Adequate knowledge on the arrangements needed for ensuring the safe operation and maintaining the condition of auxiliary machinery including control systems and machinery on deck to suit all modes of operation.

bearings, stern tubes, propellers, ship-side fittings. **Control systems** Principles of operation, testing, operational fault rectification of automatic control and alarm systems. **Deck machinery** Principles involved with the construction, operation and maintenance of deck machinery.	

Competence (iii): Manage fuel and ballast operations

Content of examination	Criteria for satisfactory examination
Fuel and ballast pumping systems General requirements concerning fuel and ballast pumping systems with particular reference to prevention of marine pollution.	Adequate knowledge on fuel and ballast operations including planning, preparation, procedures, monitoring and safety precautions to meet operational requirements and prevent pollution of environment.

Competence (iv): Use internal communication systems

Content of examination	Criteria for satisfactory examination
Internal communication systems Principles and use of all internal communication systems on board.	Adequate knowledge on the types, system details, function and use of all internal communication equipment or arrangement for effective transmission and reception of messages.

Function 2: Electrical, electronic and control engineering at the management level

Competence: Test, detect faults and maintain and restore electrical, electronic and control equipment to operating condition

Content of examination	Criteria for satisfactory examination
Electrical and electronic control equipment Safe and efficient operation of electrical machines, systems and electronic control equipment including fault diagnostics.	Proficiency in planning and procedures to carry out maintenance activities in accordance with technical, legislative, safety and procedural specification. Proficiency in identifying the effects of malfunctions of electrical and electronic control equipment on associated plant.

Function 3: Maintenance and repair at the management level

Competence (i): Organize safe maintenance and repair procedures

Content of examination	Criteria for satisfactory examination
Marine engineering practice Maintenance of operating records, the planning of maintenance schedules and the procurement of stores and spare parts.	Proficiency in planning and procedures to carry out maintenance activities in accordance with technical, legislative, safety and procedural specifications.
Maintenance and repair procedures Organizing and carrying out safe maintenance and repair procedures.	Adequate knowledge on appropriate plans, for maintenance and repair. Understanding action taken leading to the restoration of plant by the most suitable method.

Competence (ii): Detect and identify the cause of machinery malfunctions and correct faults

Content of examination	Criteria for satisfactory examination
Machinery malfunction Detection of machinery malfunction, location of faults and action to prevent damage.	Proficiency on the methods based on recommended practices and procedures for comparing actual operating conditions. Proficiency in the principles for taking action and decisions to deal with machinery malfunction in accordance with recommended operating specifications and limitation.

Competence (iii): Ensure safe working practices

Content of examination	Criteria for satisfactory examination
Safe working practice i. Safe working practices in machinery operation and maintenance. ii. Safe working practices to be observed for entry into confined or enclosed spaces.	Adequate knowledge on working practices with reference to legislative requirements, code of practice, permits to work and environmental concerns to ensure safety and health of those living and working on board ship.

Function 4: Controlling the operation of ship and care for persons on board at the management level

Competence (i): Control trim, stability and stress

Content of examination	Criteria for satisfactory examination
Effects on trim and stability due to ship damage i. Knowledge of the effect on trim and stability of a ship in the event of damage to and consequent flooding of a compartment and counter measures to be taken. ii. Knowledge of IMO recommendations concerning ship stability.	Understanding the criteria for maintaining stability and stress conditions within safety limits at all times.

Competence (ii): Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea and protection of the marine environment

Content of examination	Criteria for satisfactory examination
Knowledge of relevant international maritime laws embodied in international agreements and conventions i. Certificates and other documents required to be carried on board vessels by international conventions, how they may be obtained and the period of their legal validity. ii. responsibilities under the relevant requirements of the International Convention on Load Lines, International Convention for the Safety of Life at Sea, International Convention for the Prevention of Pollution from vessels. iii. maritime declaration of health and the requirements of the International Health Regulations. iv. responsibilities under international instruments affecting the safety of the ship, passengers, crew or cargo. v. methods and aids to prevent pollution of the environment by vessels. vi. knowledge of national legislation for implementing international agreements and conventions.	Thorough understanding of the legal responsibilities at the management level and procedures for monitoring operations and maintenance in compliance with legislative requirements. Proficiency in identification of potential non-compliance. Adequate knowledge on requirements for renewal and extension of certificates to ensure continued validity of survey items and equipment.

Competence (iii): Maintain safety and security of the vessel, crew and passengers and the operational condition of life-saving, fire fighting and other safety systems

Content of examination	Criteria for satisfactory examination
Life-saving appliance regulations A thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea). **Fire and abandon ship drills** Organization of fire and abandon ship drills. **Maintenance of safety systems** Maintenance of operational conditions of life-saving, fire-fighting and other safety systems. **Protection of persons** Actions to be taken to protect and safeguard all persons on board in emergencies. **Emergency Actions** Actions to limit damage and salve the ship following fire, explosion, collision or grounding.	Adequate knowledge on the function, use and procedures for maintaining in operational state of the life-saving appliances, fire-fighting appliances and other safety systems. Proficiency in procedures for handling emergency to salve the ship and persons on board following fire, explosion, collision or grounding.

Competence (iv): Develop emergency and damage control plans and handle emergency situations

Content of examination	Criteria for satisfactory examination
Ship construction and damage control Shipbuilding materials. Watertight integrity of hull and compartments. Damage control arrangement. **Fire prevention, detection and extinction** Fire prevention, detection, extinction. Principles of operation, application and maintenance of fire extinguishers, respirators, safety lamps. General requirements of fire pumping systems. Fixed fire detection and extinguishing arrangements for accommodation, cargo and machinery spaces. **Life-saving appliances** Function and use of life-saving appliances.	Proficiency in plans for emergency situations and the emergency procedures. Proficiency in practices and requirements for maintaining fire-fighting appliances to operational conditions.

	Proficiency in practices and requirements for maintaining life-saving appliances to operational conditions.

Competence (v): Organize and manage the crew

Content of examination	Criteria for satisfactory examination
Personal management, organization A knowledge of personnel management and organization on board vessels.	Adequate personnel management concept for managing crew to execute duties and achieve performance in accordance with the competency standard.
International maritime conventions A knowledge of international maritime conventions and recommendations, and related national legislation.	Adequate knowledge on international maritime conventions.

4.10 **Engineering Knowledge (2)**

The syllabus for this examination is the same as that for the Engineering Knowledge (2) examination of the Class 2 examination. However, the candidate will be expected to answer more in depth questions than the Class 2 examination, and from the perspective that would be expected of a candidate for assuming the duties of a Chief Engineer.

Function 1: Marine engineering at the management level

Competence (i): Start up and shut down main propulsion and auxiliary machinery including associated systems

Content of examination	Criteria for satisfactory examination
Fuels and lubricants Physical and chemical properties of fuel oils and lubricating oils; general requirements concerning fuel oil and lubricating oil systems.	Adequate knowledge on types, specifications, properties, usage, preparation and treatment of fuel and lubricating oils. Understanding the methods of making available fuels and lubricants.

Competence (ii): Operate, monitor and evaluate engine performance and capacity

Content of examination	Criteria for satisfactory examination
Operation and maintenance of compression ignition engines i. Working principles and constructional details of compression ignition engines, turbo-chargers, running gear, chains.	Adequate knowledge on the design features, constructional details, installation

ii. Safe and efficient operation and maintenance of compression ignition engines. The determination, recognition and rectification of irregularity in the performance of diesel machinery. Indicator cards. iii. Fuel injection system. Reversing mechanism. Starting system. Gearing, clutches. **<u>Marine gas turbines</u>** Operation and maintenance of marine gas turbines.	requirements and maintenance of compressions ignition engines. Adequate knowledge on operating the engine to achieve performance level to meet the operational requirements and in accordance with technical specifications. Proficiency on the methods of measuring load capacity of engines in accordance with technical specifications. Adequate knowledge on operating and maintaining ancillary equipment to achieve performance level to meet the operational requirements and in accordance with technical specifications. Proficiency in operational and maintenance requirements of marine gas turbines.

Function 2: Electrical, electronic and control engineering at the management level

Competence: Operate electrical and electronic control equipment

Content of examination	Criteria for satisfactory examination
<u>Automation, instrumentation and control systems</u> i. Main propulsive machinery control systems, automation and instrumentation. ii. Bridge control.	Adequate knowledge on instrumentation and proficiency in operation of control equipment and systems to the designed performance level.

Function 3: Maintenance and repair at the management level

Competence: Organize safe maintenance and repair procedures

Content of examination	Criteria for satisfactory examination
<u>Marine engineering practice</u> i. Principles of preventive, corrective and condition monitoring maintenance strategy and repair technology for marine engine and machinery. ii. Common recurrent failures and causes on marine engine. **<u>Safe maintenance and repair procedures</u>**	Proficiency in planning and procedures to carry out maintenance activities in accordance with technical, legislative, safety and procedural specifications.

Methods of dealing with wear and tear of engines. Alignment of machinery components. Correction of defects. Temporary and permanent repairs in the event of breakdown. Overhauling of machinery. Safe working practice.	Adequate knowledge on appropriate plans, specifications, materials and equipment to be made available for maintenance and repair. Understand action taken leading to the restoration of plant by the most suitable method.

4.11 **Oral Examination**

The oral examination will determine if the candidate has gained sufficient knowledge and skills to fulfil the duties of a chief engineer officer on board a coastal-going ships. Questions will be taken selectively through the range of topics detailed in the engineering knowledge syllabuses.

The examiner may also ask questions on items contained in other syllabuses to the extent necessary to test the candidate's knowledge in the operational and safety aspects relevant to the chief engineer officer's duties.

CHAPTER 5

TYPE RATING CERTIFICATE (TRC) FOR DYNAMICALLY SUPPORTED CRAFT (DSC) OR HIGH-SPEED CRAFT (HSC)

5.1 General

5.1.1 An officer manning the station of Chief Engineer or Second Engineer of any passenger DSC/HSC or any cargo DSC/HSC of 500 gross tonnage and upwards shall, in addition to the appropriate certificate of competency, be required to hold a valid TRC for the type and model of craft in which he intends to serve.

5.1.2 The TRC should be revalidated every two years.

5.2 Type Rating Certificate

5.2.1 In order to qualify for the issue of a TRC, an applicant must:

(a) hold an appropriate certificate of competency or a licence issued under the Merchant Shipping (Seafarers)(Certification of Officers) Regulation;

(b) have satisfactorily completed an approved training course on the type and model of DSC or HSC for which the TRC is required;

(c) pass the examination specified in paragraph 5.2.2;

(d) produce a valid medical fitness certificate, or equivalent; and

(e) pay the appropriate fee.

5.2.2 Examination for Type Rating Certificate

(a) The examination will comprise an oral and practical handling test carried out on board the type and model of craft to which the TRC refers.

(b) The syllabus for TRC examination specified in paragraph 5.2.3 is written in general terms. A detailed syllabus for a particular type and model of craft will be agreed with each operating company.

5.2.3 Syllabus for TRC Examination

(a) a thorough knowledge of the operational limitations of the craft and of any operating restrictions imposed by Hong Kong Marine Department (HKMD).

(b) a thorough knowledge of the structure and layout of the vessel, including stability conditions and bilge pumping arrangements.

(c) a working knowledge of the operation of the following systems:
(i) propulsion and associated systems.

(ii) electrical system.

(iii) fire protection system.

(iv) ship control systems both in displacement and non displacement modes.

(d) a thorough knowledge of the failure modes of the control, steering and propulsion systems and the proper response to such failures.

(e) a thorough knowledge of the significance of and correct response to alarms and caution indicators on all wheelhouse instrumentation.

(f) a practical handling test on the vessel to include all normal, abnormal, and emergency procedures in both displacement and non-displacement modes.

(g) a thorough knowledge of bridge procedures.

(h) a thorough knowledge of the use of life-saving and fire-fighting appliances on board and the arrangements for mustering, evacuating passengers and crew members in the event of an emergency.

(i) a thorough knowledge of cargo and vehicle stowage securement systems (for cargo high speed craft only).

5.3 Revalidation of Type Rating Certificate

5.3.1 TRC holders who wish to revalidate their certificates must:

(a) produce evidence of at least 5 months service in the appropriate rank in the type and model of DSC or HSC to which the TRC applies, during the preceding two years;

(b) produce a valid medical fitness certificate, or equivalent;

(c) pass the revalidation examination specified in paragraph 5.3.2, or satisfy the Director via an approved revalidation training or assessment as to their continued proficiency in operating the type and model of DSC or HSC to which the TRC refers. At the request of the DSC or HSC operator, and with adequate sea service which satisfy the Director, the period between revalidation examinations may be extended from 2 years to 4 years ; and

(d) pay the appropriate fee.

5.3.2 Examination for TRC Revalidation

(a) The examination will comprise an oral and practical handling test carried out on board the type and model of craft to which the TRC refers.

(b) The syllabus for TRC revalidation examination is specified in paragraph 5.3.3.

5.3.3 Syllabus for TRC Revalidation Examination

(a) In addition to the syllabus specified for the TRC Examination at paragraph 5.2.3, the assessment will be emphasized on the following aspects:

(i) knowledge of changes in operational limitations of the craft.

(ii) knowledge of updated information on operating conditions and restrictions imposed by HKMD, including Marine Department Notices and other publications.

(iii) knowledge of modifications concerning the structure, equipment, machinery, control and safety systems of the craft.

(iv) knowledge of changes in emergency procedures and arrangements.

(v) knowledge of lessons or experience learned from recent casualties, accidents and breakdowns.

(b) Also, the candidate is expected to have a more in-depth knowledge of the operational systems, to be more conversant in dealing with emergency situations and breakdowns.

5.4 Application for Type Rating Examination

5.4.1 Application for Type Rating Certificate and Revalidation of Type Rating Certificate should be made in writing to:

River Trade and Local Examination Sections
Marine Department
3/F Harbour Building
38 Pier Road
Central
Hong Kong
Tel: (852) 2852 4364
Fax: (852) 2541 6754
E-mail: seexam@mardep.gov.hk

5.4.2 Examination appointment is to be mutually agreed subject to the availability of an examiner. Applications should be made well in advance of the date of examination and a vessel of appropriate type and model should be available.

Appendix I

Standard Form of Documents

FORM 1

SEA SERVICE TESTIMONIAL

(Name and address of shipping company)

I certify that the following is a full and true statement of the sea service performed by ..... under my supervision in MV/SS .....
O.N .....

Period of Service (Dates)		Rank of officer and actual seniority on watch	Description of Main Machinery	Nature of duties (For appropriate description see below)
From	To			

During the whole period stated above this engineer officer,
(a) was granted no leave of absence
(b) was granted days of leave whilst still on crew agreement.

Report as to ability .....

Report as to conduct .....

Report as to sobriety .....

Signature of Chief Engineer Officer .....

(Technical Manager .....
(or
Signature of (Master or other representative of owners
(
(.....

I Day work
II Regular* watch on auxiliary machinery
III Regular* watch on main propulsion machinery:
(a) in full charge,
(b) in subsidiary capacity
IV Regular work practices in vessels possessing:
(a) centralized control room
(b) full or partial automation
(c) facility to operate machinery in the unattended mode for a significant proportion of each twenty four hour period.

* Regular watch means eight hours in every twenty four hours.

This form should be used when the engineer officer concerned, or the Chief Engineer Officer, leaves a ship.